

Optima[®] EPS



**Optima Form⁴
Electronic
Cabinet
System**



**DESIGN GUIDE &
ORDERING CATALOG**

Table of Contents



Part Number System

Note: The flow of information in this catalog follows the same sequence as the Order Form on the last two pages. For your convenience, the component part numbering format is repeated below.

Frame Design (F4)

	Page
☐ Standard Sizes (Height, Width, Depth).....	1
☐ Dimensions	1-2
☐ Material Specs	3
☐ Corner Die Casting.....	3
☐ Extrusion Profiles.....	3

Frame Type (FT)

☐ EMI/RFI Type	4
☐ NEMA 12 / UL 508 Type.....	4
☐ Non-Gasketed	4
☐ Frame Preparation (FP)	4

Mounting Rail Options (MR)

☐ Standard	4
☐ Heavy-duty Punched.....	4
☐ Heavy-duty Tapped	4
☐ Telecom Industry	4

Base Options (B)

☐ Caster Provision.....	5
☐ Bolt-down Provision.....	5

Top Panel Options (TP)

☐ Fixed Top Panels.....	6
☐ Quick-Release Top Panels.....	6
☐ Mushroom Top Panels.....	6

Door Style Options (DS)

☐ Standard Door Design Features	7
☐ Glazed Doors	8
☐ Vented Doors	9
☐ Solid Doors	10
☐ Short Doors with I/O Panels	10

Side Panel Options (SP)

☐ Fixed Side Panels	11
☐ Quick-Release Side Panels	11

Bottom Panel Options (BP)

☐ Solid Panel	12
☐ Perforated Panel	12
☐ Solid Panel with Cable Exit.....	12

Recessed Mounting Rail Option

Accessories

☐ Air Conditioner.....	13
☐ Bus Bars.....	13
☐ Casters.....	13
☐ Connector Kits.....	13
☐ Fan Trays.....	14
☐ Grounding Straps.....	14
☐ Leveling Feet.....	14
☐ Lifting eye Bolts.....	14
☐ Nameplates	15
☐ Panels - Front.....	15
☐ Power Outlet Strips.....	15
☐ Storage Shelves	15-16
☐ Support Angles	16

EMI/RFI Shielding Test Results

Ordering Guide

F4-(HWD) (FT) - (FP) - (MR) - (B) - (TP)

F4-(HWD)(FT)- (DS)

F4-(HWD)(FT)- (SP)

F4-(HWD)(FT)- (BP)

Optima EPS

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<http://www.optimaEPS.com> e-mail: sales@optimaeps.com

Optima Form⁴



Standard Sizes*

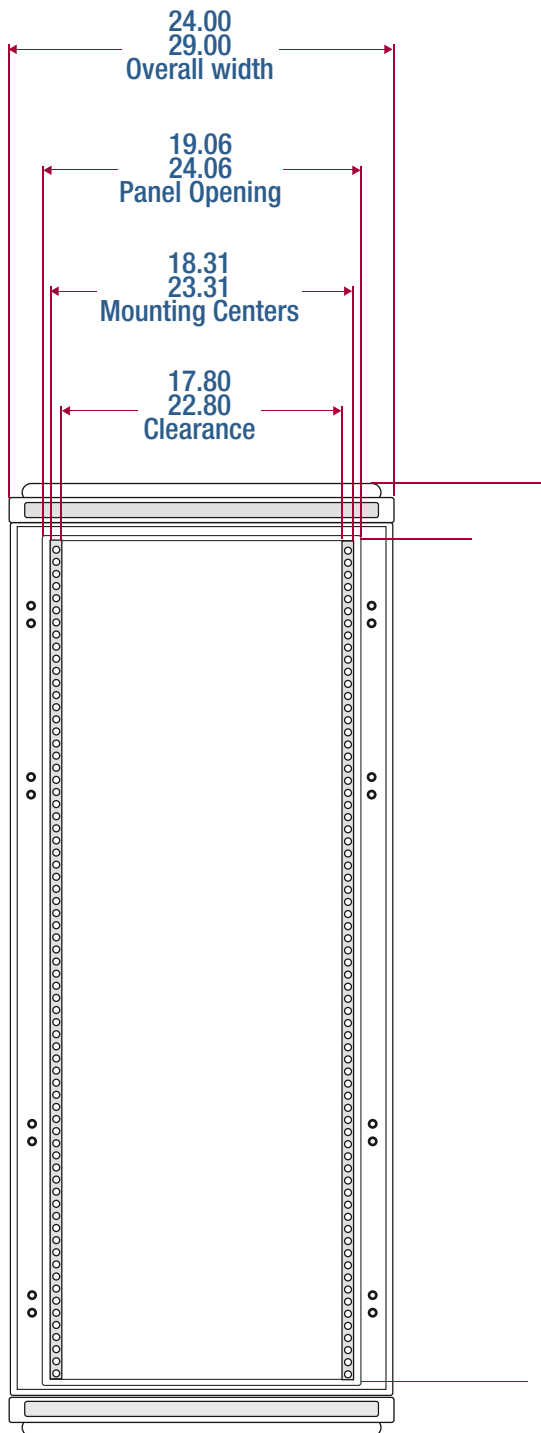
Height (Inches): 21, 28, 35, 42, 52, 61, 70, 77

(U): 12, 16, 20, 24, 30, 35, 40, 44

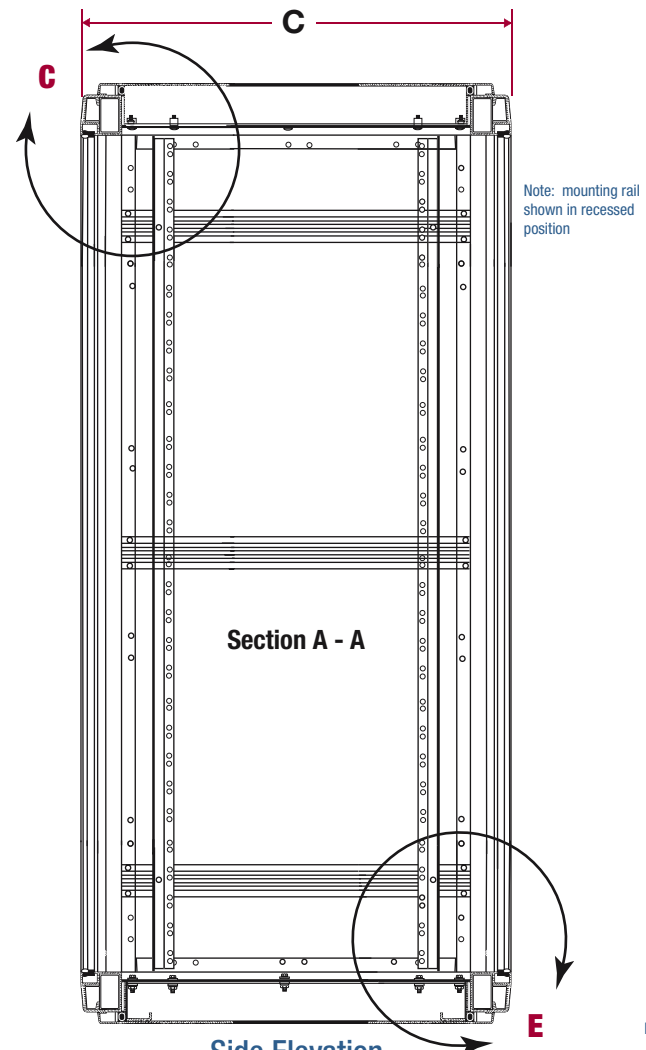
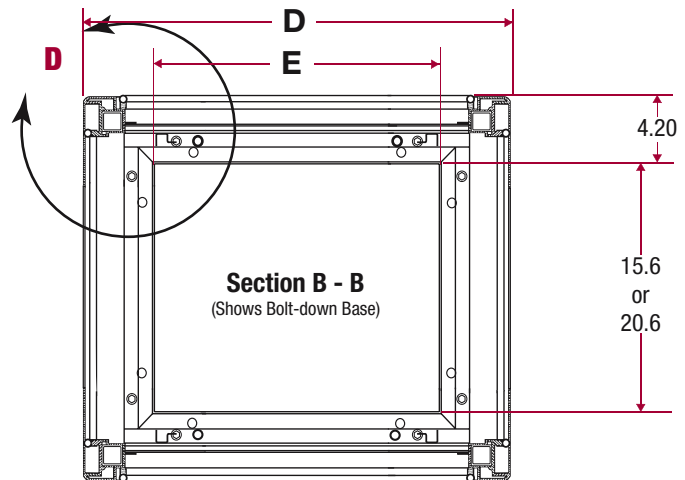
Width (Inches): 19, 24

Depth (Inches): 24, 30, 36

**Modified sizes available on request.*



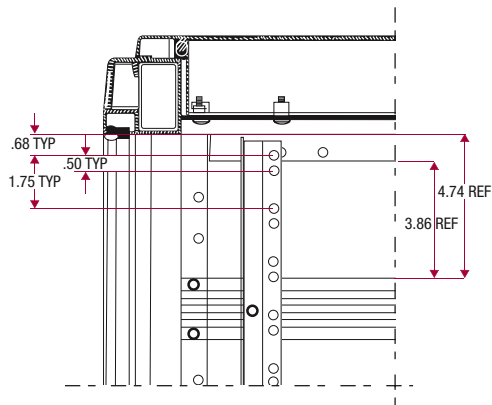
Front / Rear Elevation



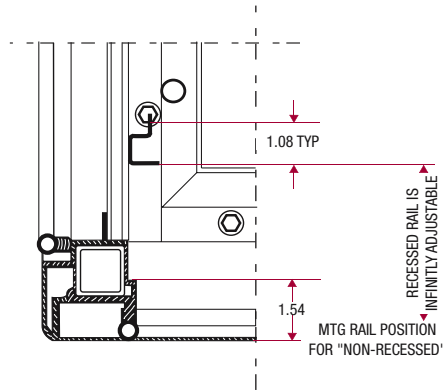
Side Elevation

Patented

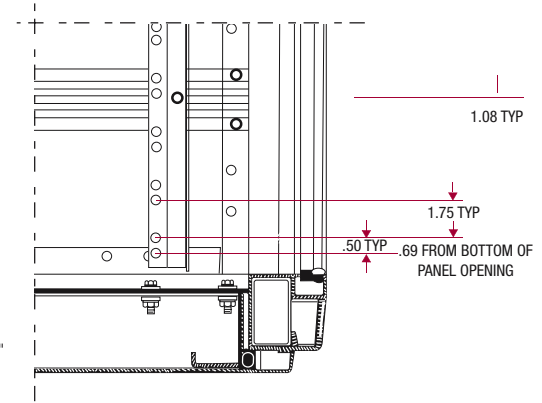
Frame Dimensional Data



DETAIL C



DETAIL D
Rotated 90°



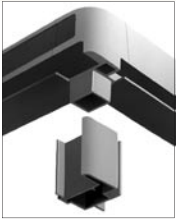
DETAIL E

Dimensions

	(U)	A	B	C	D	E
Frame Designation		Panel Height	Overall Height	Panel Depth	Overall Depth	Clear Space
F4-21XX24 _ _	12	21.12	27.68	24.00	27.08	18.16
F4-28XX24 _ _	16	28.12	34.68	24.00	27.08	18.16
F4-35XX24 _ _	20	35.12	41.68	24.00	27.08	18.16
F4-42XX24 _ _	24	42.12	48.68	24.00	27.08	18.16
F4-52XX24 _ _	30	52.62	59.18	24.00	27.08	18.16
F4-61XX24 _ _	35	61.38	67.94	24.00	27.08	18.16
F4-70XX24 _ _	40	70.12	76.68	24.00	27.08	18.16
F4-77XX24 _ _	44	77.12	83.68	24.00	27.08	18.16
F4-21XX30 _ _	12	21.12	27.68	30.00	33.08	24.16
F4-28XX30 _ _	16	28.12	34.68	30.00	33.08	24.16
F4-35XX30 _ _	20	35.12	41.68	30.00	33.08	24.16
F4-42XX30 _ _	24	42.12	48.68	30.00	33.08	24.16
F4-52XX30 _ _	30	52.62	59.18	30.00	33.08	24.16
F4-61XX30 _ _	35	61.38	67.94	30.00	33.08	24.16
F4-70XX30 _ _	40	70.12	76.68	30.00	33.08	24.16
F4-77XX30 _ _	44	77.12	83.68	30.00	33.08	24.16
F4-21XX36 _ _	12	21.12	27.68	36.00	39.08	30.16
F4-28XX36 _ _	16	28.12	34.68	36.00	39.08	30.16
F4-35XX36 _ _	20	35.12	41.68	36.00	39.08	30.16
F4-42XX36 _ _	24	42.12	48.68	36.00	39.08	30.16
F4-52XX36 _ _	30	52.62	59.18	36.00	39.08	30.16
F4-61XX36 _ _	35	61.38	67.94	36.00	39.08	30.16
F4-70XX36 _ _	40	70.12	76.68	36.00	39.08	30.16
F4-77XX36 _ _	44	77.12	83.68	36.00	39.08	30.16

XX = 19" or 24" width cabinet

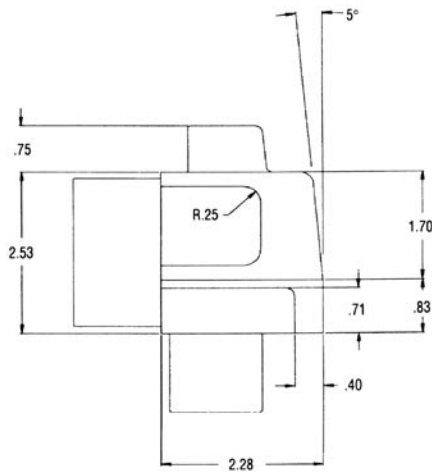
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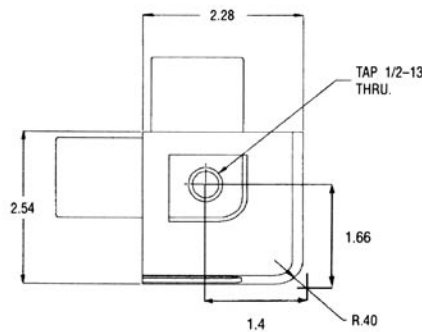
Material Specification

Corner Die Casting	Aluminum 380 Alloy
Extrusions	Aluminum 6063-T5 Alloy

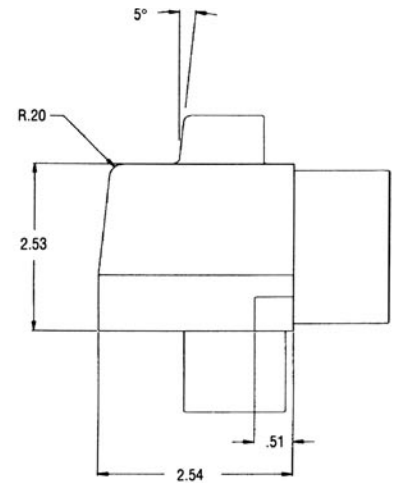
Corner Die Casting



Front Elevation

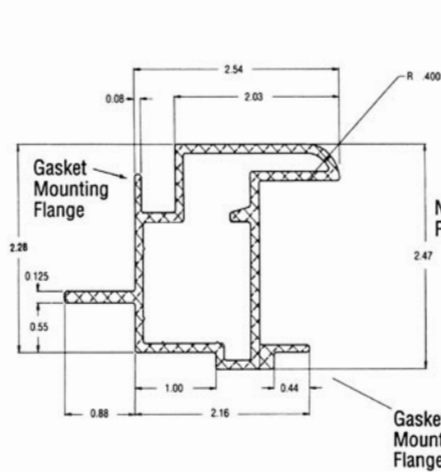


Top Elevation

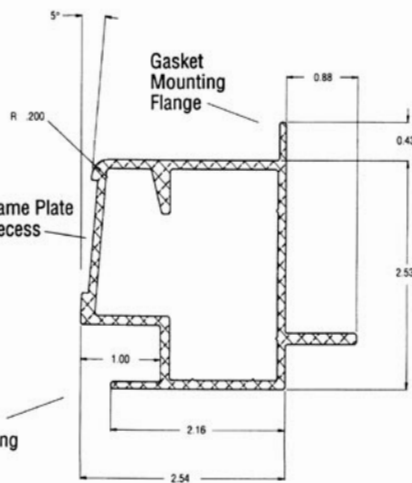


Side Elevation

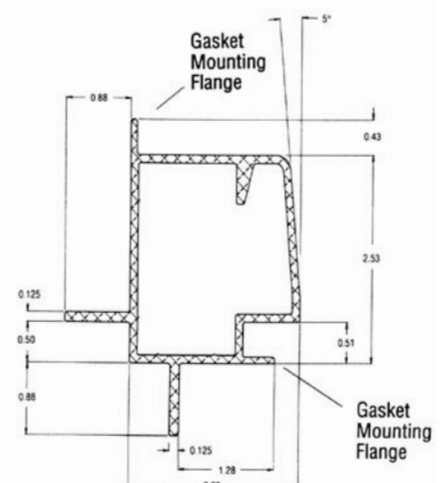
Extrusion Profiles



Vertical Member



Top/Bottom Crossmember



Corner Member

Note: Gasket Mounting Flange is omitted for Non-gasketed versions (XG).

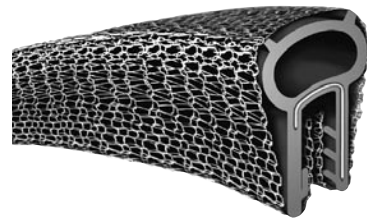
Patented

Toll Free: 1-800-9-OPTIMA



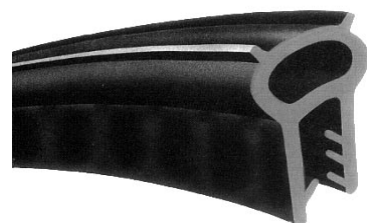
EMI/RFI Shielded Frame (RF)

- ☐ Standard frame is pre-drilled for full-length front/rear doors (Consult Optima for options)
- ☐ Gasket Material: Two layers of double-knit, tin-plated, copper-clad, steel mesh mounted to NEMA 12/UL 508 gasket
- ☐ Dynamic mechanical properties yield a high deflection range and eliminate compression set
- ☐ Excellent electrical conductivity
- ☐ Evaluated by Instrument Specialties in relation to FCC, VDE and C.I.S.P.R. specifications



NEMA 12/UL 508 Environmental Protection Frame (NM)

- ☐ Material: EPDM (Ethylene-Propylene-Diene)
- ☐ Resistant to: UV, Ozone, weathering, seawater, compression set and abrasion
- ☐ Temperature Range: 120°C to -40°C
- ☐ Flexible, self-gripping design
- ☐ Successfully tested on a UL 508 enclosure by Underwriter's Lab
- ☐ Evaluated by Intertek Testing Services in relation to UL 478 and CSA 220 applications



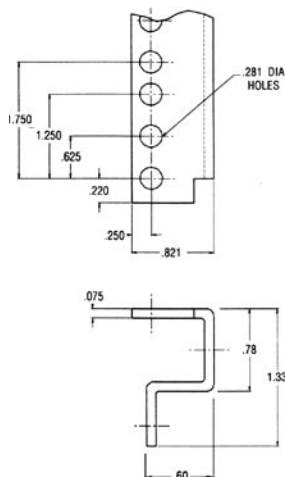
DESIGN NOTE:

Paragraph 6.11 of UL 50, the Standard for Enclosures for Electrical Equipment, states that a Type 12 enclosure shall have no unsealed openings. A sample of the Optima Form4 test enclosure, with ventilation openings located on the top, bottom and door of the enclosure was subjected to a spray of atomized water, by UL. The ventilation openings are covered with Model No. 900-04, 30 PPI filters. The nozzle was held 12–15 inches from the enclosure and the spray of water was directed at all areas of potential dust entry. The enclosure had no water inside. These results were considered acceptable by UL.

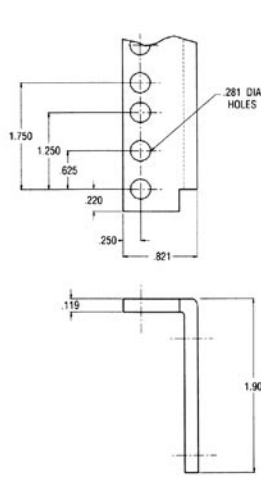


Mounting Rail Options (MR)

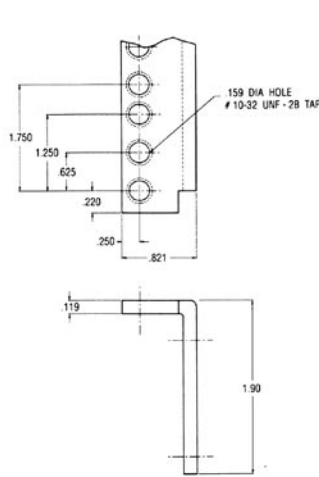
- ☐ ANSI/EIA - 310-C and Telecom Standards
- ☐ Finish: ASTM-B633 Type III Bright Zinc



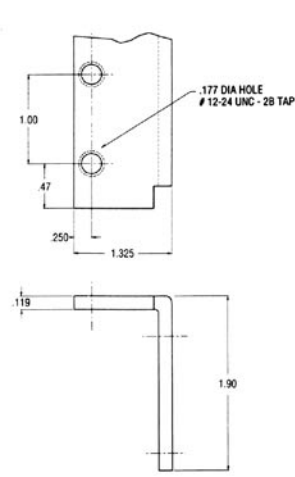
Standard (SR)
14 gauge (.075" THK.) CRS



Heavy-duty Punched (PR)
11 gauge (.119" THK.) CRS



Heavy-duty Tapped (TR)
11 gauge (.119" THK.) CRS



Telecom Industry (TI)
11 gauge (.119" THK.) CRS
(22.31" mounting centers for 24" wide cabinets only)

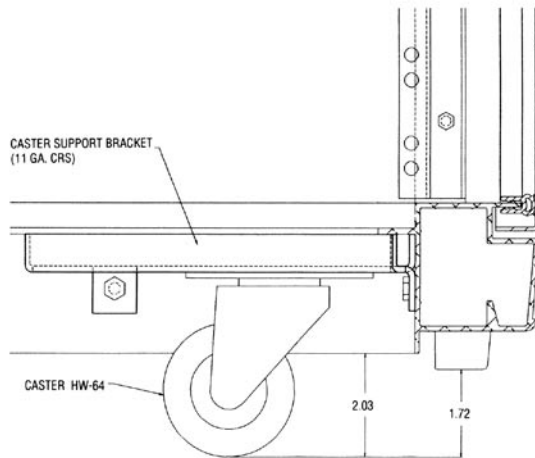


Caster Provision – Support Bracket (CB)

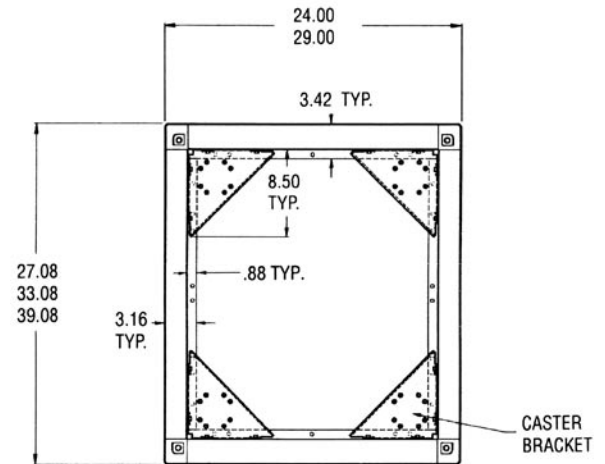
- ☐ Stationary and Swiveling Casters can be ordered as accessories on page 13
- ☐ Casters increase cabinet height by 1.72" and caster brackets restrict access through bottom panel

Support Bracket Material

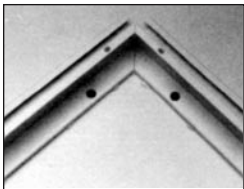
- ☐ 11 gauge CRS (.119" Thick)
- ☐ Painted



Support Bracket Section



View on underside of cabinet

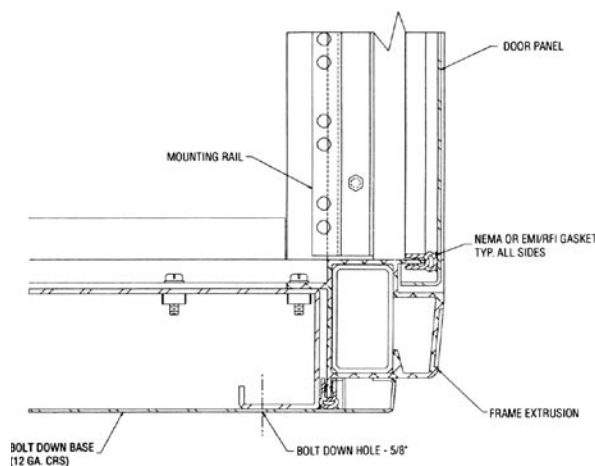


Bolt-Down Provision – Base (BD)

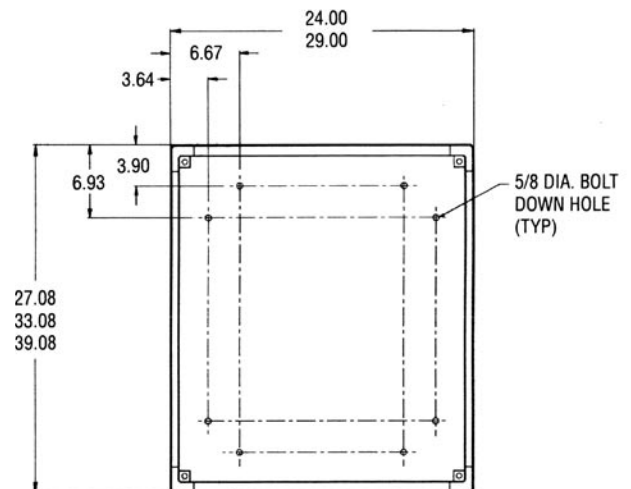
- ☐ Custom cable entry can be provided.
- ☐ Hold down holes can be adjusted to meet your requirements.

Bolt-Down Base Material

- ☐ 12 gauge CRS (.104" Thick)
- ☐ Painted (NEMA)
- ☐ Painted over zinc plating (RF)

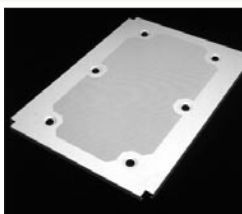


Base Cross Section



View C - C Bottom

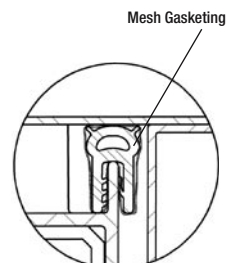
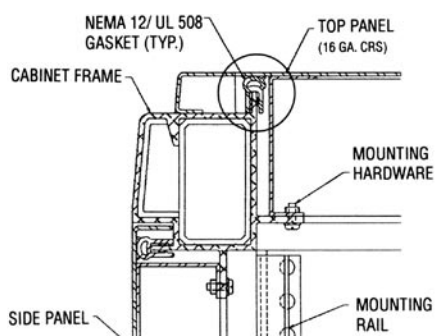
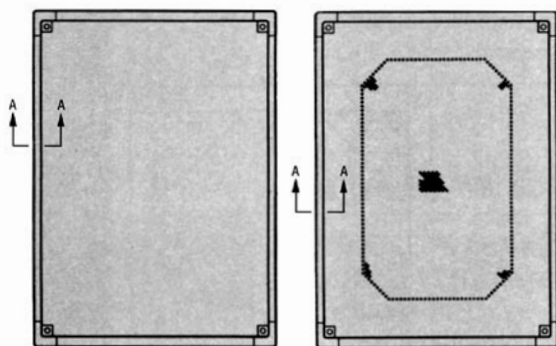
Patented



- ☐ Solid Top (ST)
- ☐ Perforated Top (PT)
- ☐ Solid Quick-release Top (SQ)
- ☐ Perforated Quick-release Top (PQ)
- ☐ Mushroom Top – ventilated drip-resistant (MT)

Type	Top Panel Material
NEMA 12/UL 508	16 Ga. CRS (.059" THK)
Non-Gasketed	16 Ga. CRS (.059" THK)
EMI/RFI	Aluminum Alloy (.090" THK)

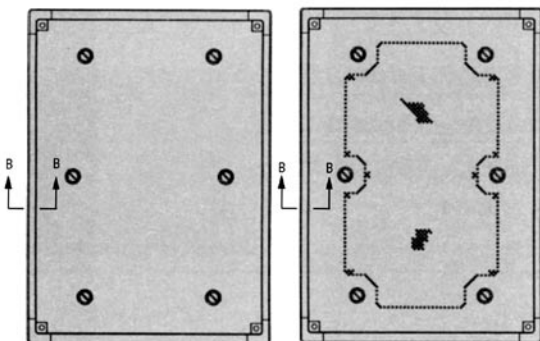
Fixed Top Panels



EMI/RFI Version

Section A - A NEMA 12/UL 508 Solid Version

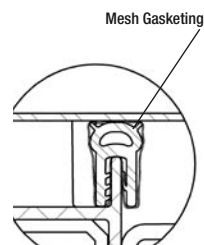
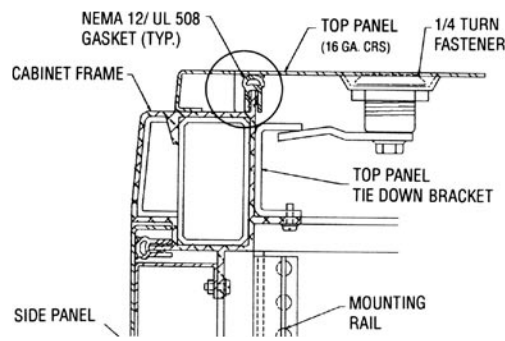
Quick-Release Top Panels



Solid Quick-Release
Top Panel (SQ)

Perforated
Quick-Release Top (PQ)

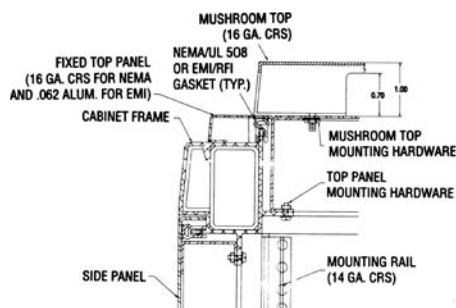
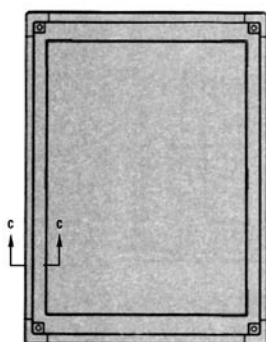
Note: Non-Gasketed version uses four (4) fasteners.



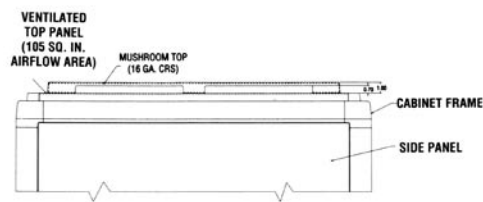
EMI/RFI Version

Section B - B NEMA 12/UL 508 Solid Version

Mushroom Top (MT) – Ventilated drip-resistant (NEMA 12/UL 508 version)



Section C - C



Cabinet Side View

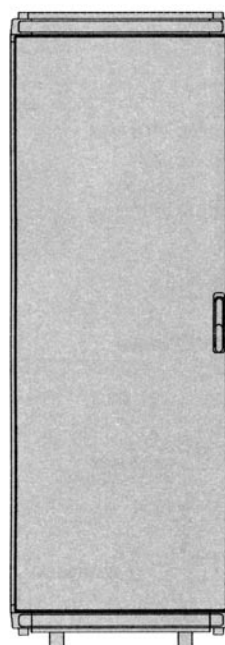
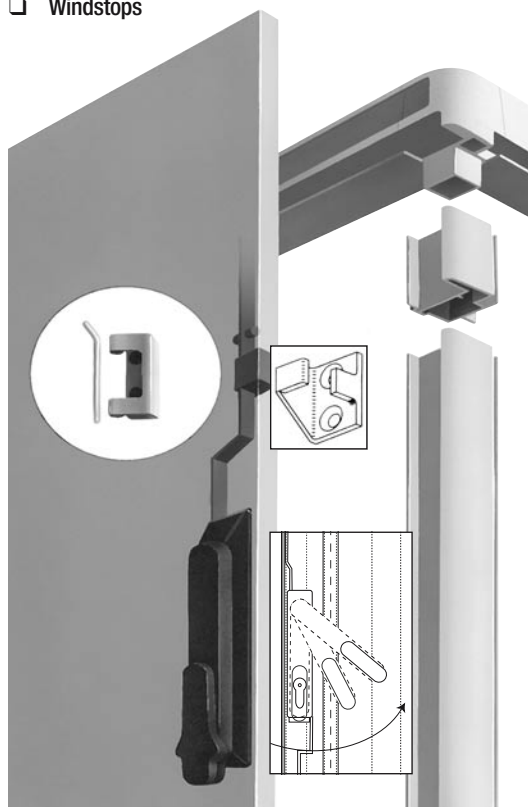
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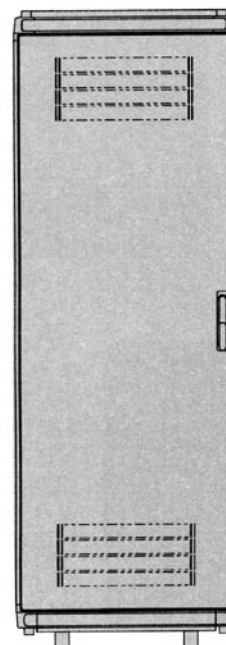
- ☐ Glazed Doors
- ☐ Vented Doors
- ☐ Solid Doors
- ☐ Short Doors with I/O Panels

Standard Design Features

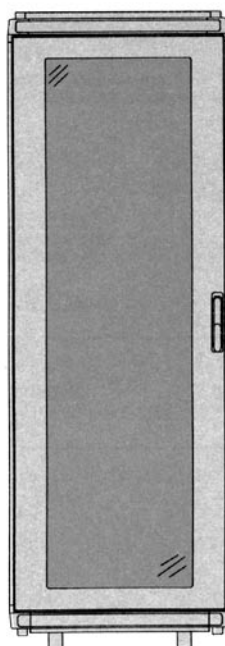
- ☐ All doors field-reversible (symmetrical design)
- ☐ Left or right-hand hinged
- ☐ Concealed (internal) hinges are standard and allow doors to open 112°
- ☐ External hinges are optional and allow doors to open 210°
- ☐ Multi-point locking system (NM&RF)
 - two locking points per door: 21" – 42" Hts.
 - four locking points per door: 52" – 77" Hts.
- ☐ Key-locked door: standard (non-locking are optional)
- ☐ Doors are removable using pin arrangement
- ☐ Custom punching available upon request
- ☐ Heavy-duty door stiffening frame ensures rigidity
- ☐ Polyamide swing handle
- ☐ Doors can be mounted in front or rear
- ☐ Flammability rating: UL 94
- ☐ Windstops



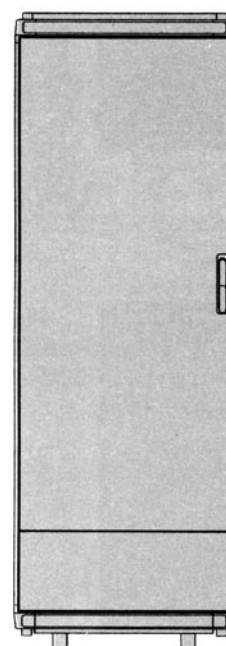
Solid Doors



Vented Door



Glazed Door



Short Door with I/O Panel

Patented



Glazed Doors

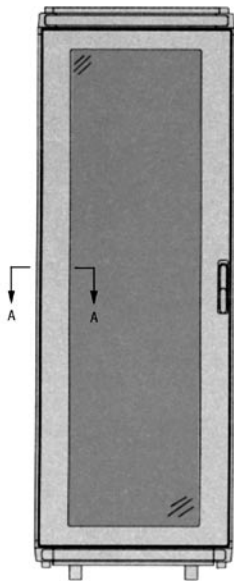
Type	Door Material
NEMA 12/UL 508	14 Ga. CRS (.075" THK)
Non-Gasketed	14 Ga. CRS (.075" THK)
EMI/RFI	14 Ga. CRS (.075" THK) (ASTM-B633 Type III Bright zinc plated)

Glazing Material – NEMA 12/UL 508

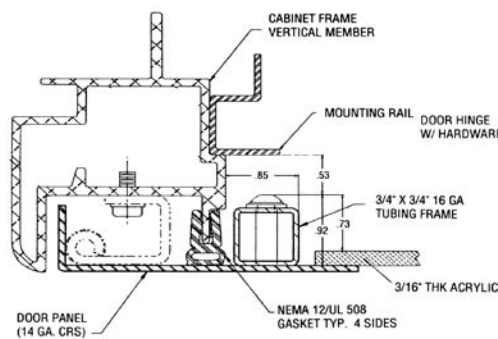
- ☐ 3/16" thick acrylic
- ☐ Color: 103-2 grey
- ☐ UL 94 HB rated
- ☐ Bonded to door frame using VHB tape
- ☐ UL 94 V0 available upon request

Glazing Material – EMI/RFI

- ☐ .062 & .187" thick acrylic panes with mesh insert
- ☐ Conductive media blackened copper 100 OPI
- ☐ Color: clear
- ☐ UL 94 HB rated
- ☐ Fully laminated design
- ☐ Window clamped into position
- ☐ UL 94 V0 available upon request

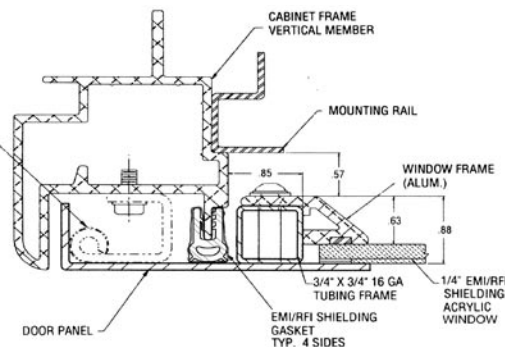


Cross Section: Door and Frame

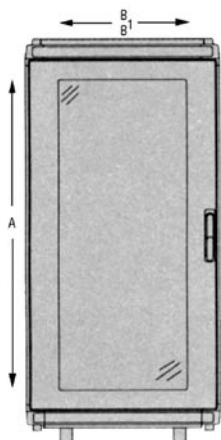


Section A-A
NEMA 12/UL 508

Cross Section: Door and Frame



Section A-A
EMI/RFI



Viewing Area

Door Model No. Prefix	Viewing Height A	19" Viewing Width B	24" Viewing Width B1
FD-21XX	17.56"	15.87"	20.87"
FD-28XX	24.56	15.87	20.87
FD-35XX	31.56	15.87	20.87
FD-42XX	38.56	15.87	20.87
FD-52XX	49.06	15.87	20.87
FD-61XX	53.0*	15.87	20.87
FD-70XX	53.0*	15.87	20.87
FD-77XX	53.0*	15.87	20.87

*Greater Heights may be achieved using 2 sections. Contact Optima Sales to discuss

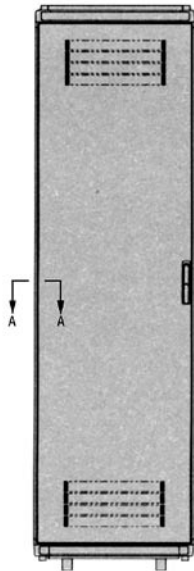
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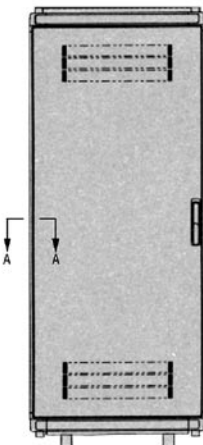
Vented Doors

- ☐ Top Vented
- ☐ Bottom Vented
- ☐ Fully Vented

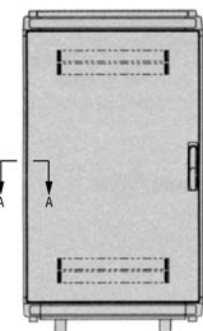
Type	Door Material
NEMA 12/UL 508	14 Ga. CRS (.075" THK)
Non-Gasketed	14 Ga. CRS (.075" THK)
EMI/RFI	14 Ga. CRS (.075" THK) (ASTM-B633 Type III Bright zinc plated)



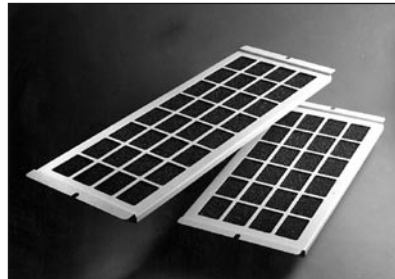
Vents: 52-77"



Vents: 35-42"



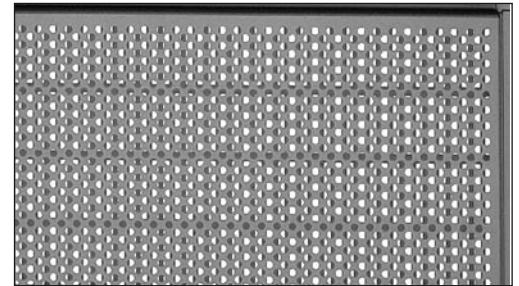
Vents: 21-28"



NEMA 12/UL 508 filters and frames

NEMA 12/UL 508 Version

- ☐ Air filters are removable and washable in detergent
- ☐ Filter material: polyester urethane; UL 94-HF1 rated
- ☐ 1/2" thick core; 30 pores per inch
- ☐ Frame material: 18 ga. CRS

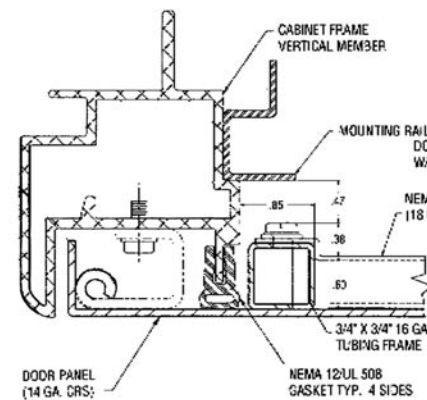


EMI/RFI vent with plenum

EMI/RFI Version

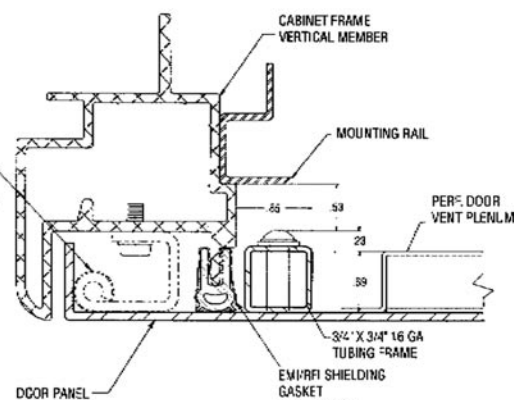
- ☐ Plenum spotwelded to door
- ☐ 16 Ga. CRS, perforated
- ☐ .187" diameter holes on 45° staggered centers

Cross Section: Door and Frame



Section A-A
NEMA 12/UL 508

Cross Section: Door and Frame



Section A-A
EMI/RFI



Solid Doors

Type

Door Material

NEMA 12/UL 508

14 Ga. CRS (.075" THK)

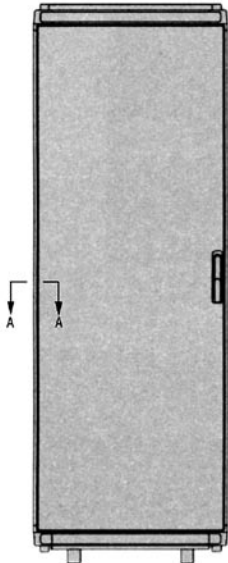
Non-Gasketed

14 Ga. CRS (.075" THK)

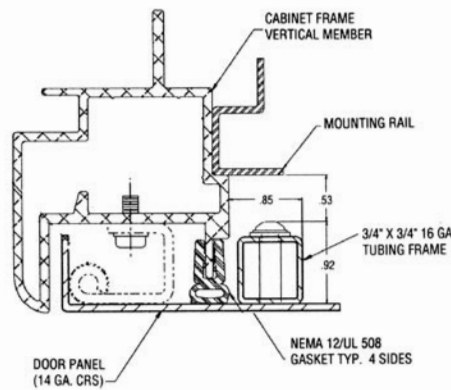
EMI/RFI

14 Ga. CRS (.075" THK)

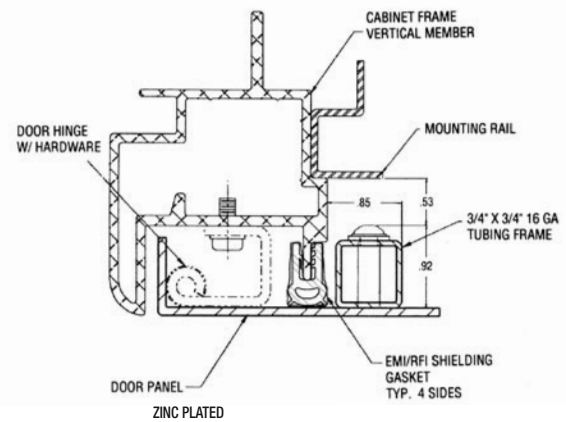
ASTM-B633 Type III Bright zinc plated



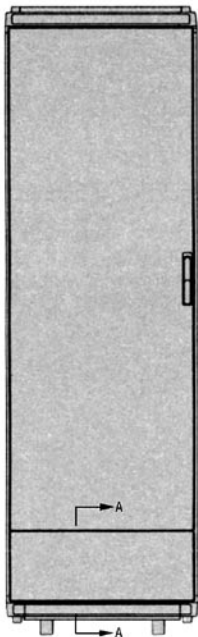
Solid Door



Section A-A
NEMA 12/UL 508



Section A-A
EMI/RFI

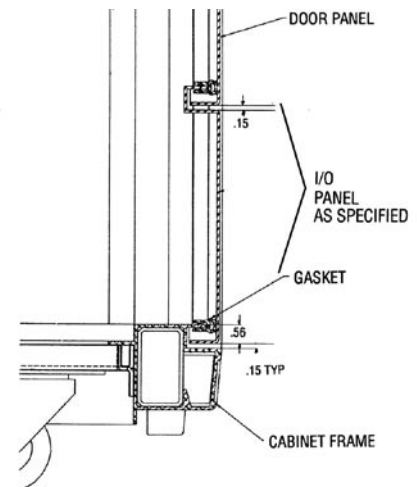


Short Door with
I/O Panel

Short Doors with I/O Panels

- ☐ Sized to suit your specific cable exit/entry requirements
- ☐ Custom punching available
- ☐ Multiple I/O panel configurations possible: top-mounted, bottom-mounted or both
- ☐ May be vented, glazed or combination of both
- ☐ EMI/RFI and NEMA 12/UL 508 integrity is maintained

Contact Optima Sales and Engineering Staff to discuss your particular application.



Section A-A

Patented



Side Panels

☐ Fixed Sides

☐ Quick Release Sides

Type

Door Material

NEMA 12/UL 508

16 Ga. CRS (.059" THK)

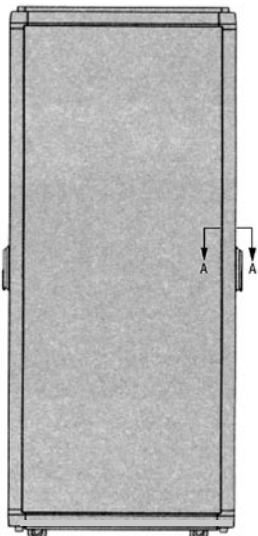
Non-Gasketed

16 Ga. CRS (.059" THK)

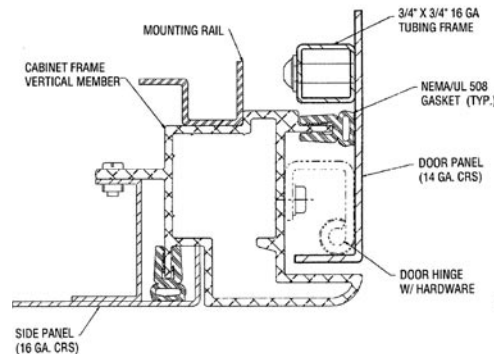
EMI/RFI

Aluminum Alloy (.062" THK)

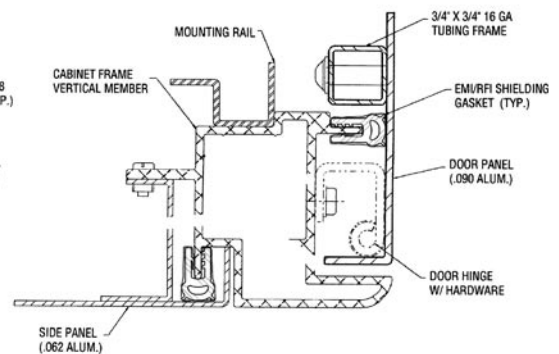
Fixed Side



Fixed Side

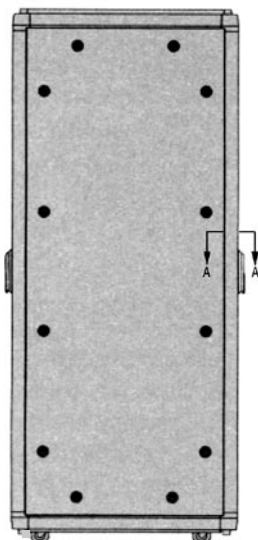


Section A-A
NEMA 12/UL 508



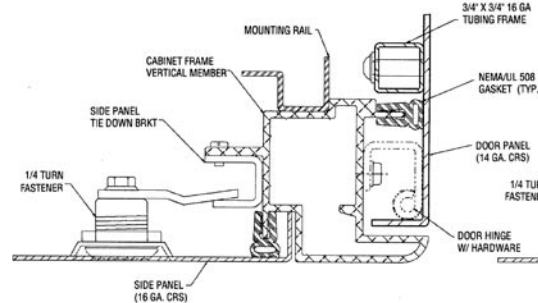
Section A-A
EMI/RFI

Quick Release Side

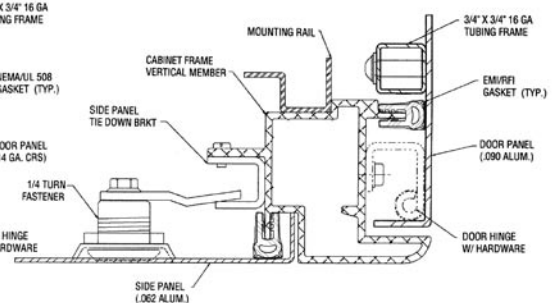


Side with Quick
Release Fasteners

*Note: Non-Gasketed version (XG)
uses fewer fasteners.*



Section A-A
NEMA 12/UL 508



Section A-A
EMI/RFI

Quick Release Fasteners

Type

Fastener Material

NEMA 12/UL 508

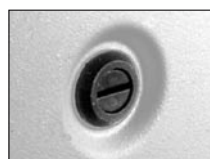
Polyamide, black finish

EMI/RFI

Zinc die-cast, chrome finish
with ground nut

Non-Gasketed

Polyamide, black finish



NEMA 12/UL 508 Fastener



Interior fastener design

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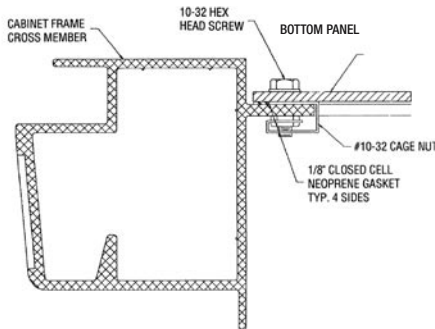


Bottom Panel Options

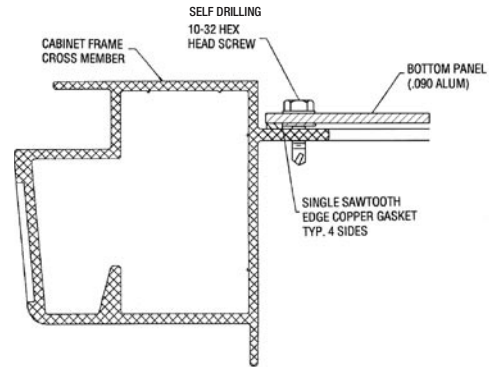
- ☐ Solid Bottom Panel (PS)
- ☐ Perforated Bottom Panel (PP)
(available for EMI/RFI version only)
- ☐ Solid with Cable Exit (CE)

Type	Door Material
NEMA 12/UL 508	16 Ga. CRS (.059" THK)
Non-Gasketed	16 Ga. CRS (.059" THK)
EMI/RFI	Aluminum Alloy (.090" THK)

Cross Section: Bottom Panel and Frame

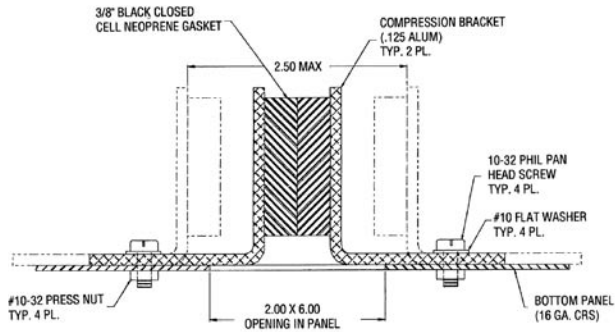


NEMA 12/UL 508 Version

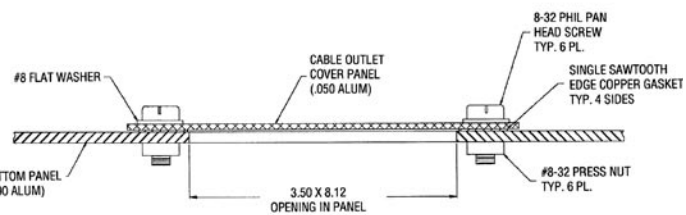


EMI/RFI Version

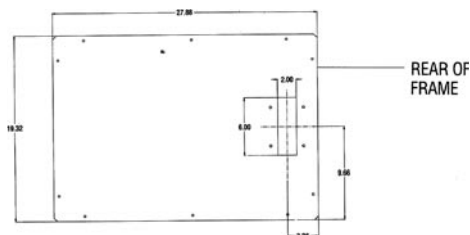
Solid Bottom Panel with Cable Exit



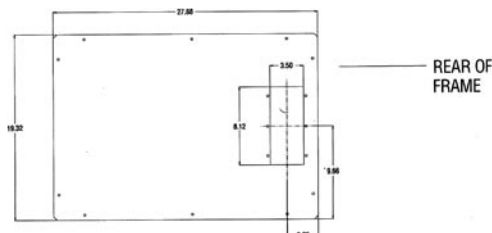
Non-Gasketed & NEMA 12/UL 508 Version



EMI/RFI Version



REAR OF FRAME

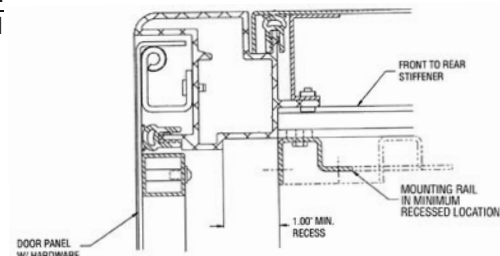


REAR OF FRAME

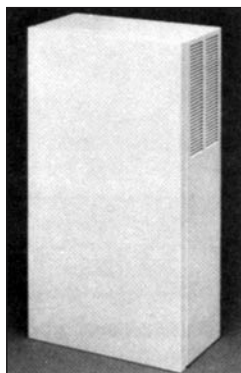


Recessed Panel Mounting Rail Option

- ☐ Mounting rails may be located in fixed position on vertical supports or in adjustable position, recessed on front-to-rear stiffener.
- ☐ Standard, Heavy-duty Punched, Heavy-duty Tapped, and Telecom Industry mounting rails can be recessed (see page 4 for descriptions).
- ☐ Infinite location adjustment.



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Air Conditioner

- ☐ Closed loop continuous air circulation
- ☐ Thermostatically controlled
- ☐ Cooling capacity: 4000 BTU/Hr. at maximum ambient temperature
- ☐ Internal condensate evaporation
- ☐ Reduced noise level
- ☐ Operates at unusually high ambient temperature: 131°F/55°C
- ☐ Easy access to unit for simple cleaning

Model No. F4-AC4000

- ☐ Utilizes environmentally safe refrigerant
- ☐ Designer appearance with no visible fasteners
- ☐ Can be mounted on side or door of enclosure
- ☐ 600 CFM blower
- ☐ Rated voltage 115V, 60Hz
- ☐ Full load: 14 Amps
- ☐ Weight: 118 lbs.
- ☐ Dimensions: 29.5"H x 15.75" W x 8.63" D

Bus Bars



- ☐ Bus bars offer convenient, isolated, common grounding mechanism
- ☐ Material: 110 copper alloy (1.00" W x .25" D)
- ☐ 10-32 tapped holes spaced evenly, on 3.5" centers
- ☐ Available in standard heights from 12U to 44U (21, 28, 35, 42, 52, 61, 70, 77")
- ☐ Custom sizes available

Model No. Cabinet Height

BB-21I	21"
BB-28I	28
BB-35I	35
BB-42I	42
BB-52I	52
BB-61I	61
BB-70I	70
BB-77I	77

Casters

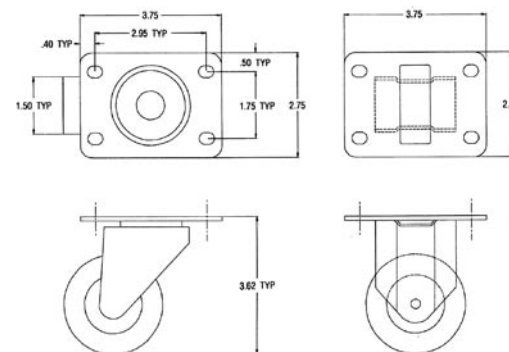


- ☐ Heavy-duty, single-wheel casters: 2.63" diameter
- ☐ Set of four supports 1,020 lbs.
- ☐ Tested for load deflection, impact strength, rotation and mobility
- ☐ Meets ANSI and GSA specifications
- ☐ Shipped uninstalled unless specified (w/hardware)
- ☐ Adds 1.72" to total height of cabinet
- ☐ Wheel material: black Polyolefin

Model No. Caster Types

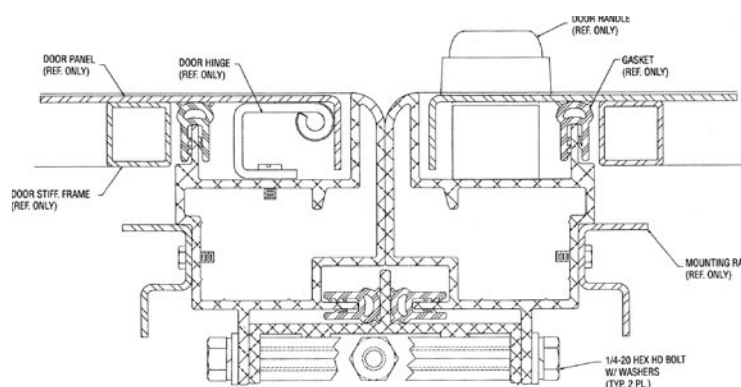
HW-64 SS 4 swivel casters

HW-64 SF 2 swivel & 2 fixed



Connector Kits

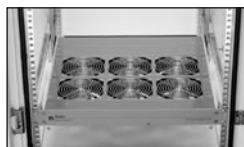
- ☐ Complete kit includes aluminum extrusion frame and hardware used to join two cabinets
- ☐ To order, complete model information on page 18



Patented



Fan tray FTA-319



Fan tray FTA-619

Fan Trays

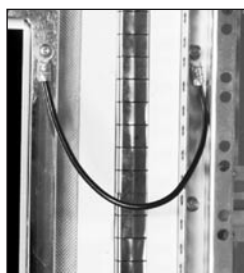
Features: (all fan trays)

- ❑ Standard 19" and 24" EIA rack mounting
- ❑ Compact 1U (1.73") panel height
- ❑ Inlet and exhaust guards
- ❑ UL recognized and CSA certified fans
- ❑ All fans 106 CFM rating
- ❑ 115 VAC 50/60 Hz sleeve bearing fans
- ❑ 115 VAC molded cordset
- ❑ Fan trays with 6, 8, 9 or 12 fans feature separate fan plates and extruded side rails that allow full adjustment of fan plate positions. Rear support brackets adjust from 18.38" to 26.00"

Model No.	No. Fans	Total CFM
FTA-319	3	318
FTA-619	6*	636
FTA-919	9	954
FTA-424	4	424
FTA-824	8*	848
FTA-1224	12	1272

* Filler plates prevent air recirculation.
For further information on these models contact Optima.

Grounding Straps



- ☐ Ensures safety standards are maintained
- ☐ Meets VDE specifications
- ☐ Grounding for frame, doors, top and side
- ☐ Kit includes six - 10" wires

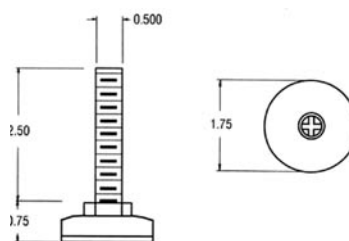
Model No.	Qty.
GS-08	6

Leveling Feet



- ☐ Set of four adjustable screw/pads screw into bottom corner sockets
- ☐ Recommended for use when cabinet is to be located on uneven floor
- ☐ Nickel-plated 1.75" diameter base
- ☐ Stud length: 2.5"
- ☐ Base material: low carbon steel
- ☐ Pad material: white nylon
- ☐ Thread: 1/2 - 13

Model No.	Qty.
HW-44	4

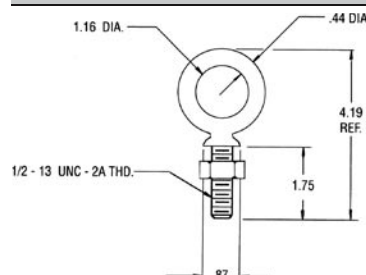


Lifting Eye Bolts



- ☐ Set of four removable eye bolts screw into top corner sockets
- ☐ One set of four supports up to 1,000 lbs.
- ☐ Material: zinc-plated, forged steel

Model No.	Qty.
HW-60	4



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Nameplate

- ☐ Suitable for customer logo or system designation
- ☐ Supplied as a pair and may be mounted top, bottom, front or rear with VHB tape (supplied).
- ☐ Plate height: 1.22"
- ☐ Material: .032" THK aluminum alloy
- ☐ Finish: painted

Model No.	Cabinet Width	Nameplate Width
F4-NP-19	19"	22.23"
F4-NP-24	24"	27.23"

Note: when silkscreening of Nameplates is required, add suffix "SS" to end of Model No.

Panels - Front

- ☐ Special grade .125" sheet aluminum (5052-H34 EPS) designed for electronic use
- ☐ All edges deburred and chamfered ready for multi-step painting process
- ☐ Panel finish is textured (unless specified otherwise)
- ☐ Mounting holes are standard EIA spacing

Width Nominal Ht.	19" Width Model No.	24" Width Model No.	Width Nominal Ht.	19" Width Model No.	24" Width Model No.
			15.75" (9U)	P-1519	P-1524
1.75" (1U)	P-119		17.50 (10U)	P-1719	P-1724
P-124			19.25 (11U)	P-1919	P-1924
3.50 (2U)	P-319	P-324	21.00 (12U)	P-2119	P-2124
5.25 (3U)	P-519	P-524	22.75 (13U)	P-2219	P-2224
7.00 (4U)	P-719	P-724	24.50 (14U)	P-2419	P-2424
8.75 (5U)	P-819	P-824	26.25 (15U)	P-2619	P-2624
10.50 (6U)	P-1019	P-1024	28.00 (16U)	P-2819	P-2824
12.25 (7U)	P-1219	P-1224			

Power Outlet Strips



Power Outlet Strip

- ☐ Available in four sizes
- ☐ Adjustable mounting locations
- ☐ 15 Amps - 125 Volts; outlets grounded
- ☐ Circuit breaker, switch and pilot light
- ☐ 15 ft. power cord supplied (14/3 SJT with molded plug)
- ☐ Aluminum housing with impact resistant end caps
- ☐ Mounting hardware included
- ☐ Meets UL 1363 standards
- ☐ CSA approved, UL recognized

Model No.	No. Outlets	Case Length
PO-0418	4	18"
PO-0712	7	13"
PO-0848	8	48"
PO-1968	19	68"

For further information on these and other models, contact Optima.

Storage Shelves – Solid-fixed Shelf



Solid-fixed storage shelf

- ☐ Supports chassis or power supplies
- ☐ Stores tools, test leads, chart paper, etc.
- ☐ Materials: 16 ga. CRS, painted; bolts to panel mounting rails
- ☐ All mounting hardware included
- ☐ If used with "L-shaped" rails, HW-77 is hardware required.

Width Depth	19" Width Model No.	24" Width Model no.
20"	SS-1920	SS-2420
24"	SS-1924	SS-2424
30"	SS-1930	SS-2430

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Flow-thru storage shelf

Storage Shelves – Flow-thru

- ☐ Provides extra storage without restricting ventilation
- ☐ Removeable wire shelf mounts on support bracket affixed to mounting rails
- ☐ Materials: bright zinc plated .3" diameter framewire and .12" crosswire; painted 14 ga. CRS support bracket
- ☐ All mounting hardware included
- ☐ Load capacity: 30 lbs.

Width Depth	19" Width Model No.	24" Model no.
20"	FT-1920	FT-2420

Support Angles



- ☐ Used for supporting heavy instruments
- ☐ Support angles provide 3" of horizontal surface along each side of cabinet interior
- ☐ Slots (1.5") allow vertical adjustment
- ☐ Material: 14 ga. zinc-plated steel
- ☐ Set includes two angles and mounting hardware

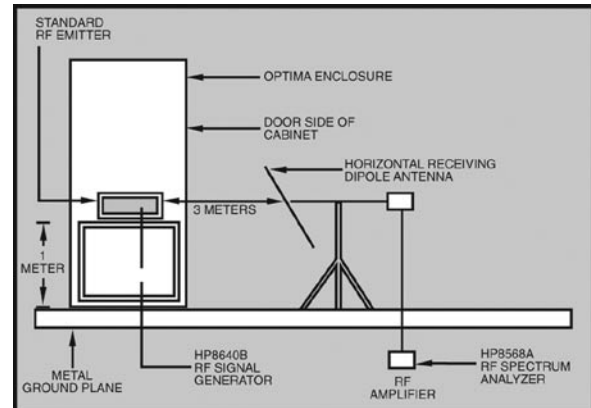
Model No.	Depth
SA-20	20"
SA-24	24"
SA-30	30"

Note: if support angles are to be mounted on "L" shape rails, HW-77 hardware is required

Optima Form⁴ Shielding Effectiveness

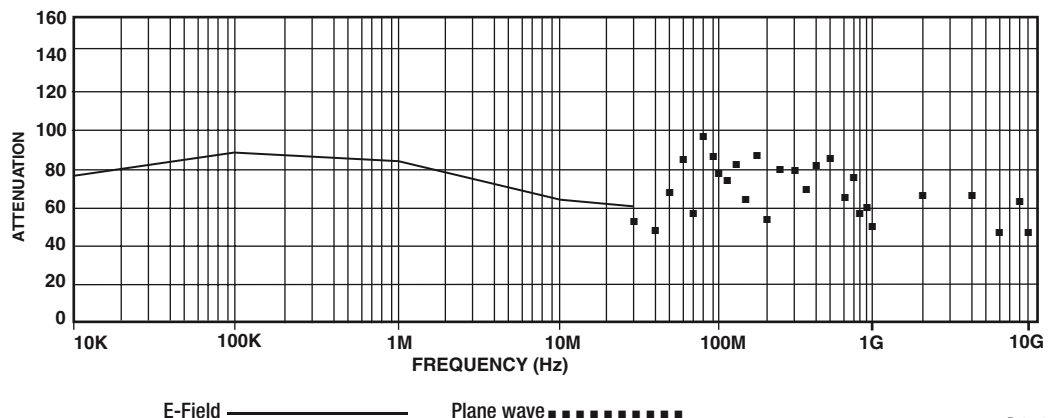
When an FCC recognized independent lab tested Optima Form⁴, the results showed a nominal 51dB shielding effectiveness throughout the 30 to 1,000 MHz frequency range. Attenuation values at varied frequencies ranged up to 98dB. This meets and exceeds the shielding standards set forth in FCC Docket #20780, Part 15, Subpart J.

Shielding effectiveness was calculated by subtracting RF levels measured with an RF emitter inside the cabinet from the RF levels recorded with emitter in the open field. RF signals from emitter were measured and recorded at various levels utilizing a calibrated dipole receiving antenna and a Hewlett-Packard Spectrum Analyzer. A copy of the complete Product Qualification Approval Report is available upon request.



E.M.I. Cabinet Attenuation

Independent Lab Tested Results



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Frame Nomenclature

Model Form ⁴ Frame	Height	Width	Depth	Type	Frame Prep	Mounting Rail	Base Type	Top Panel	Recessed Rail Facility
	21 28 35 42 52 61 70 77	19 24	24 30 36	NM RF XG*	2D 1D XD	SR PR TR TI	CB BD	ST SQ PT PQ MT	R S

* No door option also available with Type XG. Contact Optima Sales.

Abbreviations List - Frame

Type of Cabinet*	NM RF XG	NEMA 12/UL 508 Shielded EMI/RFI Non-gasketed
Drilling for Doors	2D 1D XD	2 Doors – front and rear 1 Door – XG only No doors
Mounting Rails	SR PR TR TI	Standard punched mounting rails Heavy-duty punched rails Heavy-duty tapped rails Telecom Industry type (22.31" centers for 24" wide cabinets only)
Base	CB BD	Base with caster provision Base with bolt-down provision
Top Panel	ST SQ PT PQ MT	Solid Top Solid Quick-release Perforated Top Perforated Quick-release Mushroom Top
Recessed Rail Facility	R S	Recessed mounting rails Standard mounting rail locations (i.e. attached to bezel)

Note: rear rails are recessed to next smallest depth unless specified otherwise, i.e. 36" to 30", 30" to 24", 24" to 20". Includes two extra pair of front-to-rear stiffeners, which allow rails to be adjusted to various recessed positions.

Toll Free: 1-800-9-OPTIMA

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Door Nomenclature

FD -					
Model Form ⁴ Door	Height	Width	Type	Hinge	Style
	21 28 35 42 52 61 70 77	19 24	NM RF XG	LH RH	SD TV BV FV DA VA AC

Abbreviations List – Doors

LH	Left Hinged
RH	Right Hinged
SD	Solid Door
TV	Top Vented
BV	Bottom Vented
FV	Fully Vented
DA	Door Acrylic
VA	Vented Acrylic (bottom vented only)
AC	Door for Air Conditioner mounting

Side Panel Nomenclature

FS -				
Model Form ⁴ Sides	Height	Depth	Type	Style
	21 28 35 42 52 61 70 77	24 30 36	NM RF XG	FX SQ

Abbreviations List – Side Panels

FX	Fixed sides
SQ	Quick-release sides

Bottom Panel Nomenclature

FB -				
Model Form ⁴ Bottom Panel	Width	Depth	Type	Style
	19 24	24 30 36	NM RF XG	PS PP CE

Abbreviations List – Bottom Panel

PS	Panel Solid
PP	Panel Perforated (Non-Gasketed & RF)
CE	Panel solid with Cable Exit

Connector Kit Nomenclature

FC -		
Model Form ⁴ Connector Kit	Height	Depth
	21– 77"	24 30 36

Toll Free: 1-800-9-OPTIMA

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Performance Summary

Area	Specification:	Description:	Independent Test Facility
Safety	■ UL 478	Safety standard for Information Processing and Business Equipment.	Intertek Testing Services
 Environmental	■ UL 508 Type 12	Industrial Control Equipment for indoor use to provide a degree of protection against dust, dirt, fiber flyings, dripping water and external condensation of non-corrosive liquids.	Underwriters Laboratory Inc.
			
Telecom	■ UL 1459 Second Edition	The standard for Telephone Appliances and Equipment	Underwriters Laboratory Inc.
 Dimensional	■ ANSI/EIA - 310-C	Dimensions of Racks, Panels and Associated Equipment	N/A
 EMI/RFI	■ F.C.C. Docket No. 20780 Part 15 Subpart J Class A	Emission limitations for any electronic device or system that generates and uses timing signals or pulses at a rate in excess of 10,000 pulses (cycles) per second and employing digital technique; including telephone equipment that utilizes radio frequency energy for the purpose of performing data processing functions. Class A: Industrial - a computing device that is intended for use in a commercial, industrial or business environment.	Instrument Specialties Co., Inc.
			
EMI/RFI	■ VDE 0871 Class B	Radio interference suppression of high frequency equipment for industrial, scientific and medical purposes.	Instrument Specialties Co., Inc.
			
EMI/RFI	■ MIL-STD-285	Attenuation measurements for enclosures	Instrument Specialties Co., Inc.
			
Safety	■ CSA C22.2 No. 220-M1986	Information Processing and Business Equipment	Intertek Testing Services
			
Safety	■ CSA C22.2 No. 0.7-M1984	Equipment Electrically Connected to a Telecommunications Network	Intertek Testing Services
			
Safety Europe	■ IEC 950 First Edition	Safety of Information Technology Equipment including Electrical Business Equipment	Intertek Testing Services
EMI/RFI Europe	■ C.I.S.P.R. Publication 22 First Edition	Limits and methods of measurement of radio interference characteristics of Information Technology Equipment (ITE)	Instrument Specialties Co., Inc.



Intertek
Testing
Services

**Canadian
Standards
Association**



**UNDERWRITERS
LABORATORIES**
INC.®



**International
Electrotechnical
Commission**

Optima EPS designs and manufactures custom, modified and standard electronic packaging systems for commercial, industrial and military applications worldwide, including:

- **Vertical Cabinets**
- **Multi-bay Systems of Cabinets, Desks and Consoles**
- **Desks for Electronic Systems**
- **Instrument Cases**
- **Optima Instrumate (Chassis/Card Cage/Enclosure System)**

JANUARY 2004

Optima EPS

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