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Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Selection and Application Guide

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Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

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Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

General Information

What is front connected low voltage metal-enclosed switchgear and how is it different from traditional rear connected low voltage switchgear?

With traditional rear connected low voltage switchgear, each vertical section contains the following three compartments:

1. Front compartment containing breakers and/or auxiliary components
2. Middle compartment containing vertical and horizontal bus
3. Rear compartment containing breaker connection (line and/or load). Typically the breaker connections are cables but could be busway.

With front connected low voltage switchgear, the rear breaker connection compartment is physically relocated to a separate vertical section beside the vertical section containing the breakers. All incoming and outgoing breaker connections are accessible from the front of the vertical section. Using feeder breakers with load side cable connections as an example, the runbacks coming off the load side of the feeder breakers run over to a separate section and the breaker connections are accessible from the front of the switchgear.

With front connected low voltage switchgear, all customer connections (incoming cable lugs, outgoing cable lugs, ground lugs, neutral disconnect, etc.) are front accessible.

Front connected low voltage switchgear is typically wider than a comparable rear connected low voltage switchgear lineup, but it isn't as deep and doesn't require rear working space. While the front connected low voltage switchgear footprint may be larger than a comparable rear connected switchgear lineup, the total required electrical room space (including working space) is typically smaller. Siemens front

connected low voltage switchgear combines the robust design, serviceability, safety and flexibility of UL1558 metal-enclosed low voltage switchgear in a product that is completely front accessible and front connected.

All of the features that have historically only been available in a rear connected low voltage switchgear product are now available in a front connected low voltage switchgear product. These features include:

- 4 cycle short-circuit withstand bus structure
- 60 cycle short-time withstand bus structure
- Compartmentalization
- Insulated/isolated bus
- Drawout low voltage power circuit breakers

Product Scope:

- Equipment ratings
635VAC Maximum
3 Phase 3 Wire,
3 Phase 4 Wire
50/60 Hz
5000 amp maximum horizontal bus
5000 amp maximum vertical bus
- Enclosure options
NEMA 1 Indoor

Industry Standards

Type WL switchgear with power circuit breakers are designed, tested and constructed in accordance with:

- UL 1558 — Metal-Enclosed Low Voltage Power Circuit Breaker Switchgear
- ANSI C37 .20 .1 — Metal-Enclosed Low Voltage Power Circuit Breaker Switchgear
- ANSI C37 .50 — Test Procedure for Low Voltage AC Power Circuit Breakers Used in Enclosures
- ANSI C37 .51 — Conformance Testing of Metal-Enclosed Low Voltage AC Power Circuit Breaker Switchgear Assemblies



- NEMA SG5 - Power Switchgear Assemblies
- Applicable requirements of the National Electric Code (NEC)

WL drawout circuit breakers are in accordance with:

- UL 1066 — Low Voltage AC and DC Power Circuit Breakers Used in Enclosures
- ANSI C37 .13 — Low Voltage AC Power Circuit Breakers Used in Enclosures
- ANSI C37 .16 — Preferred Ratings, Related Requirements, and Application for Low Voltage Power Circuit Breakers and AC Power Circuit Protectors

UL Listing

Underwriters' Laboratories listing mark (UL) is supplied for each vertical section provided all devices within a vertical section are UL Listed or UL Recognized and suitable for the intended use. All circuit breaker drawout elements are UL Listed.

Optional CSA compliance with cUL labeling is available.

Seismic Qualification

Seismic qualification to all major seismic construction standards (IBC, CBC, OSHPD, UBC, SBC, BOCA and IEEE 693) is available.

Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Construction Details

General

The Siemens Type WL switchgear assembly consists of one or more metal-enclosed vertical sections. The end sections are designed to allow installation of future sections.

Included in each assembly are various components such as circuit breakers, instrumentation and control equipment, transformers, relays, three-phase bus work, and all internal wiring, connectors, and other supporting equipment.

In accordance with ANSI C37.20 .1, the maximum temperature for parts that are handled is 50°C. The main bus maximum temperature rise is 65°C above 40°C ambient. The temperature rise of the air surrounding the cable connection points is limited to 45°C above 40°C ambient.

Finish

During construction, the structural steel parts, panels, and compartments are all prepared for painting by a five-stage wash system .

Standard finish color is light gray ANSI 61. The standard painting process is a UL approved electrostatic powder coat paint system utilizing a polyester powder coat paint. The completed finish has a nominal 2 mils dry film thickness .

Assembly Construction

Siemens Type WL metal-enclosed low voltage switchgear is constructed of a rigid internal frame structure that minimizes the possibility of damage during shipment and supports multiple installation methods – rolling or lifting. Lifting eyes are integrated into the internal frame design and ensure the structural integrity of the lifting assembly is always adequate for the weight of the total structure .

Each breaker is barriered and compartmented from all other breakers in the front compartment. This design also isolates the breakers in the front compartment from the bus compartment.

Optional barriers can be supplied to isolate the bus compartment from the cable compartment. Other optional barriers include: (1) Full depth section barriers to isolate one section from the adjacent section(s). (2) Barriers to isolate the incoming line side connections to the main breaker(s) from the load side bus and connections in the switchgear section. (Line/load barriers are provided as a standard feature for service equipment main breakers.)

Optional Features

Siemens front connected low voltage switchgear comes with the following optional features:

- Insulated/isolated bus
- Section barriers
- Line/load barriers
- Tin plated copper bus
- Special exterior paint color
- Space heaters
- Channel sills
- OEM shipping skid
- Mimic bus
- Breaker test cabinet
- Breaker portable test unit
- Remote breaker operator
- Remote breaker racking device
- Breaker portable hoist
- Gasketed exterior covers and doors
- Ventilation filters
- Ventilation screens
- Floor plates
- Undercoating
- Fungus resistant
- Certified test reports
- Factory acceptance test
- Infrared viewport
- Bus temperature monitoring
- Cable temperature monitoring
- Environmental monitoring (temperature, humidity, smoke, etc)

Unusual Environment and Operating Conditions

If any of the following conditions exist at equipment installation site, Siemens should be advised during the specification requirements review.

- Ambient air temperature below -30 degree C or above 40 degree C
- Exposure to prolonged high humidity (above 80% humidity)
- Altitude greater than 2000 meters
- Exposure to damaging fumes, vapors, steam or salt
- Exposure to excessive dust (abrasive, magnetic or metallic)
- Exposure to abnormal vibration, shock or tilting

Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Construction Details

Main and Ground Bus

The standard main bus is silver-plated copper. Tin-plated copper bus is optionally available. Vertical and horizontal bus bar utilize a channel shape design to maximize short circuit withstand capability and minimize heat rise. All bus joints include zinc-plated Grade 5 bolts and conical spring washers. Provisions for future extension of the main bus include plated joints and high tensile strength steel hardware.

The main three-phase horizontal bus is arranged vertically one phase above the other with edge-to-edge alignment to provide high, short circuit strength. Insulated main bus with isolated vertical bus is optional. Vertical bus ratings available are 1600, 2000, 3200, 4000, and 5000 amperes continuous current. Horizontal bus ratings available are 1600, 2000, 3200, 4000, and 5000 amperes. A neutral bus is furnished when specified, and can be rated 1600, 2000, 3200, 4000, or 5000 amperes continuous current.

Two laminations of 1/4" X 1.5" standard copper ground bus extend through all sections. Cable lugs are mounted to the ground bus in each section.

Standard short-circuit withstand (4 cycle) and short-time withstand (60 cycle) bus bracing is 100,000 amperes.

Load side runbacks for feeder circuits are copper construction, are insulated with sleeve tubing in the main bus area, and are supported by high-strength bus bracing.

Control and Communication Wiring

Standard control and communication wiring is #14 AWG extra-flexible, stranded copper type SIS Control and communication wiring is installed and accessed from the front of the switchgear structure. Each breaker compartment has a dedicated horizontal and vertical wireway.

For devices not having screw-type terminals, pressure terminals are used.

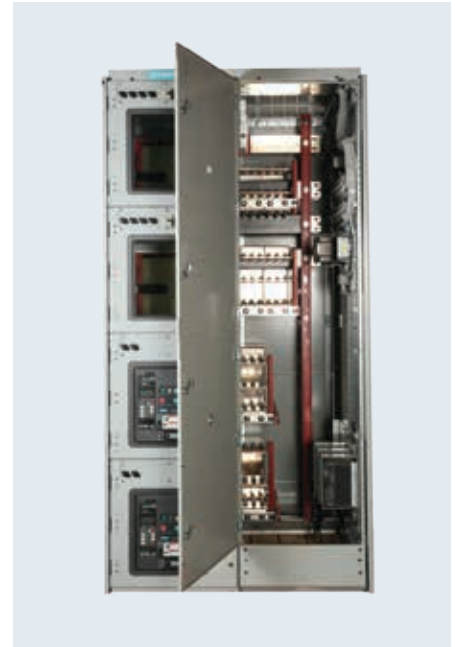
Insulation

The insulation used is a UL recognized thermoset material that has excellent heat resistance, flame retardance, dimensional stability and low moisture absorption.

Circuit Breaker Compartments

Typical circuit breaker compartments include primary disconnects, drawout rails, secondary disconnects, vertical wireway, horizontal wireway and, if applicable, TOC switch operator, MOC switch operator and associated interlocks. Draw-out rails allow the breaker to be withdrawn from the compartment without additional extensions or adapters. Up to six (2 sets of three) current transformers for metering or relaying can be mounted in each compartment.

A variety of auxiliary devices such as breaker control switches, indicating lights and pushbuttons can be mounted on the breaker compartment door.



Feeder Breaker Section with Cable Pull Doors Open

Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

WL Circuit Breaker Electronic Trip Unit Options



	ETU745	ETU748	ETU776
Basic Protective Functions			
Long-time overcurrent protection	L ●	●	●
Short-time delayed overcurrent protection	S ●	●	●
Instantaneous overcurrent protection	I ●	-	●
Neutral protection	N ●	●	●
Ground fault protection	G ○	○	○
Additional Functions			
Selectable neutral protection	●	●	●
Defeatable short-time delay	●	●	●
Defeatable instantaneous protection	●	-	●
Selectable thermal memory	●	●	●
Zone selective interlocking	○	○	○
Selectable I ² t or fixed short-time delay	●	●	●
Adjustable instantaneous pick-up	●	-	●
Selectable I ² t or I ⁴ t long-time delay	●	●	●
Adjustable short-time delay and pick-up	●	●	●
Selectable and adjustable neutral protection	●	●	●
Dual protective setting capability	-	-	●
Extended instantaneous protection	●	●	●
Parameterization and Displays			
Parameterization by rotary switches (10 steps)	●	●	-
Parameterization by communication (absolute values)	●	●	●
Parameterization by menu/keypad (absolute values)	-	-	●
Remote parameterization of the basic functions	-	-	●
Remote parameterization of the additional functions	-	-	●
Alphanumeric LCD	○	○	-
Graphical LCD	-	-	●
Metering Function			
Metering function <i>Plus</i>	○	○	○
Communication			
CubicleBUS	●	●	●
Communication via PROFIBUS-DP	○	○	○
Communication via the MODBUS	○	○	○
Communication via the Ethernet (BDA)	○	○	○

● standard - not available ○ optional

Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Breaker Technical Data

WL Circuit Breakers ANSI / UL 1066

Frame Rating Rating Class		Frame Size II													
		800				1600				2000			3200		
		N	S	H	L	N	S	H	L	S	H	L	S	H	L
Instantaneous Short-circuit Current ^① (kA RMS) 50/60 Hz	254V AC	50	65	85	100	50	65	85	100	65	85	100	65	85	100
	508V AC	50	65	85	100	50	65	85	100	65	85	100	65	85	100
	635V AC	50	65	65	85	50	65	65	85	65	65	85	65	65	85
Short-time Withstand Current I_{cw} (kA RMS) 50/60 Hz	1.0s	50	65	65	85	50	65	65	85	65	65	85	65	65	85
Extended Instantaneous Protection (kA RMS -0% to +20%)		50	65	65	85	50	65	65	85	65	65	85	65	65	85
Close and Latch Ratings (kA RMS) 50/60 Hz		50	65	65	85	50	65	65	85	65	65	85	65	65	85
Rating Plug Range		200 - 800 amps				200 - 1600 amps				200 - 2000 amps			200 - 3000 amps		
Endurance Rating (switching operations with maintenance) ^②	Mechanical	15,000				15,000				15,000			15,000		
	Electrical	15,000				15,000				15,000			15,000		

Frame Rating Rating Class		Frame Size III					
		4000			5000		
		H		L	H		L
Instantaneous Short-circuit Current ^① (kA RMS) 50/60 Hz	254V AC	85		100	85		100
	508V AC	85		100	85		100
	635V AC	85		85	85		85
Short-time Withstand Current I_{cw} (kA RMS) 50/60 Hz	1.0s	85		100 ^③	85		100
Extended Instantaneous Protection (kA RMS -0% to +20%)	254V AC 508V AC 635V AC	85		100	85		100
Close and Latch Ratings (kA RMS) 50/60 Hz		85		85	85		85
Rating Plug Range		800 - 4000 amps			800 - 5000 amps		
Endurance Rating (switching operations with maintenance) ^②	Mechanical	10,000			10,000		
	Electrical	10,000			10,000		

① Maximum rated voltage for fused breakers is 600VAC.

② Maintenance means: replacing main contacts and arc chutes (see operating instructions).

③ Short-time withstand rating is 85kA RMS at 635V AC.

Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Main Section Configurations, Non-Fused Breakers

Note 1

- Main breaker must mount in separate vertical section. Main breaker can mount in Compartment B or Compartment C – not in Compartment A or Compartment D.
- No feeder breakers are allowed in the same section as the main breaker.
- A separate incoming section must be used for incoming busway or incoming cable with FS2 3200A main or tie breaker. Available incoming section width is 32”.

Note 2

- Tie breaker must mount in separate vertical section. Tie breaker can mount in Compartment B or Compartment C – not in Compartment A or Compartment D.
- No feeder breakers are allowed in the same section as the tie breaker.
- Tie breakers are typically through bus connected on the line and load side but can be cable or busway fed also.
- A separate incoming section must be used for incoming busway or incoming cable with FS2 3200A main or tie breaker.

Note 3

- Feeder breakers greater than 2000A must use main breaker design and application guidelines. Consult factory for application support.

Note 4

- Auxiliary compartment may have reduced height and/or depth.

Note 5

- Minimum cable pull section width for 5000A feeder breaker with load side cable going out the top of the cable pull section is 40”

General Notes:

1. All compartments are 22.5” high unless noted otherwise.
2. A blank/instrument compartment can always be substituted for a breaker compartment.
3. For close coupled dry type transformer connections, Compartment A must be blank/instrument.
4. High resistance grounding (HRG) can't be located in the same section as the main breaker – it must be located in a separate section. HRG can be located in incoming cable or busway pull section.
5. Transformer incoming can be located in the same section as the main breaker – no separate cable pull section is required.

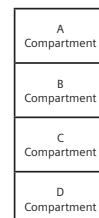
Main Sections

Non-Fused Breakers	Non-Fused Breakers	Non-Fused Breakers	Non-Fused Breakers
Blank or Instrument Compartment (22.5") Refer to Note 4	Blank or Instrument Compartment (45.0") Refer to Note 4	Blank or Instrument Compartment (22.5") Refer to Note 4	Blank or Instrument Compartment (45.0") Refer to Note 4
Main Breaker 800, 1600, 2000 (22.5") Refer to Note 1		Main Breaker 3200 (22.5") Refer to Note 1	
Blank or Instrument Compartment (45.0")	Main Breaker 800, 1600, 2000 (22.5") Refer to Note 1	Blank or Instrument Compartment (45.0")	Main Breaker 3200 (22.5") Refer to Note 1
	Blank or Instrument Compartment (22.5")		Blank or Instrument Compartment (22.5")
22" Wide	22" Wide	32" Wide	32" Wide
Non-Fused Breakers	Non-Fused Breakers	Non-Fused Breakers	Non-Fused Breakers
Blank or Instrument Compartment (22.5") Refer to Note 4	Blank or Instrument Compartment (45.0") Refer to Note 4	Blank or Instrument Compartment (22.5") Refer to Note 4	Blank or Instrument Compartment (45.0") Refer to Note 4
Main Breaker 4000 (22.5") Refer to Note 1		Main Breaker 5000 (22.5") Refer to Note 1	
Blank or Instrument Compartment (37.5")	Main Breaker 4000 (22.5") Refer to Note 1	Unusable Space (7.5")	Main Breaker 5000 (22.5") Refer to Note 1
	Blank or Instrument Compartment (15.0")	Blank or Instrument Compartment (30.0") Refer to Note 4	Unusable Space (7.5")
Unusable Space (7.5")	Unusable Space (7.5")	Unusable Space (7.5")	Unusable Space (15.0")
32" Wide	32" Wide	32" Wide	32" Wide

Switchgear Depth Dimensional Information: (Dimensions below are for internal frames – not total structure depth)

- Indoor – 39.2”

Section Compartment Arrangement:



Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Tie Section Configurations, Non-Fused Breakers

Note 1

- Main breaker must mount in separate vertical section. Main breaker can mount in Compartment B or Compartment C – not in Compartment A or Compartment D.
- No feeder breakers are allowed in the same section as the main breaker.
- A separate incoming section must be used for incoming busway or incoming cable with FS2 3200A main or tie breaker. Available incoming section width is 32”.

Note 2

- Tie breaker must mount in separate vertical section. Tie breaker can mount in Compartment B or Compartment C – not in Compartment A or Compartment D.
- No feeder breakers are allowed in the same section as the tie breaker.
- Tie breakers are typically through bus connected on the line and load side but can be cable or busway fed also.
- A separate incoming section must be used for incoming busway or incoming cable with FS2 3200A main or tie breaker.

Note 3

- Feeder breakers greater than 2000A must use main breaker design and application guidelines. Consult factory for application support.

Note 4

- Auxiliary compartment may have reduced height and/or depth.

Note 5

- Minimum cable pull section width for 5000A feeder breaker with load side cable going out the top of the cable pull section is 40”

General Notes:

1. All compartments are 22.5” high unless noted otherwise.
2. A blank/instrument compartment can always be substituted for a breaker compartment.
3. For close coupled dry type transformer connections, Compartment A must be blank/instrument.
4. High resistance grounding (HRG) can't be located in the same section as the main breaker – it must be located in a separate section. HRG can be located in incoming cable or busway pull section.
5. Transformer incoming can be located in the same section as the main breaker – no separate cable pull section is required.

Tie Sections

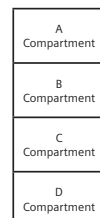
Non-Fused Breakers	Non-Fused Breakers	Non-Fused Breakers	Non-Fused Breakers
Blank or Instrument Compartment (22.5") Refer to Note 4	Blank or Instrument Compartment (45.0") Refer to Note 4	Blank or Instrument Compartment (22.5") Refer to Note 4	Blank or Instrument Compartment (45.0") Refer to Note 4
Tie Breaker 800, 1600, 2000 (22.5") Refer to Note 2		Tie Breaker 3200 (22.5") Refer to Note 2	
Blank or Instrument Compartment (45.0")	Tie Breaker 800, 1600, 2000 (22.5") Refer to Note 2	Blank or Instrument Compartment (45.0")	Tie Breaker 3200 (22.5") Refer to Note 2
	Blank or Instrument Compartment (22.5")		Blank or Instrument Compartment (22.5")
22" Wide	22" Wide	32" Wide	32" Wide

Non-Fused Breakers	Non-Fused Breakers	Non-Fused Breakers	Non-Fused Breakers
Blank or Instrument Compartment (22.5") Refer to Note 4	Blank or Instrument Compartment (45.0") Refer to Note 4	Blank or Instrument Compartment (22.5") Refer to Note 4	Blank or Instrument Compartment (45.0") Refer to Note 4
Tie Breaker 4000 (22.5") Refer to Note 2		Tie Breaker 5000 (22.5") Refer to Note 2	
Blank or Instrument Compartment (37.5")	Tie Breaker 4000 (22.5") Refer to Note 2	Unusable Space (7.5")	Tie Breaker 5000 (22.5") Refer to Note 2
	Blank or Instrument Compartment (15.0")		Unusable Space (7.5")
Unusable Space (7.5")	Unusable Space (7.5")	Unusable Space (7.5")	Unusable Space (15.0")
32" Wide	32" Wide	32" Wide	32" Wide

Switchgear Depth Dimensional Information: (Dimensions below are for internal frames – not total structure depth)

- Indoor – 39.2”

Section Compartment Arrangement:



Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Feeder Section Configurations, Non-Fused Breakers

Note 1

- Main breaker must mount in separate vertical section. Main breaker can mount in Compartment B or Compartment C – not in Compartment A or Compartment D.
- No feeder breakers are allowed in the same section as the main breaker.
- A separate incoming section must be used for incoming busway or incoming cable with FS2 3200A main or tie breaker. Available incoming section width is 32”.

Note 2

- Tie breaker must mount in separate vertical section. Tie breaker can mount in Compartment B or Compartment C – not in Compartment A or Compartment D.
- No feeder breakers are allowed in the same section as the tie breaker.
- Tie breakers are typically through bus connected on the line and load side but can be cable or busway fed also.
- A separate incoming section must be used for incoming busway or incoming cable with FS2 3200A main or tie breaker.

Note 3

- Feeder breakers greater than 2000A must use main breaker design and application guidelines. Consult factory for application support.

Note 4

- Auxiliary compartment may have reduced height and/or depth.

Note 5

- Minimum cable pull section width for 5000A feeder breaker with load side cable going out the top of the cable pull section is 40”

General Notes:

1. All compartments are 22.5” high unless noted otherwise.
2. A blank/instrument compartment can always be substituted for a breaker compartment.
3. For close coupled dry type transformer connections, Compartment A must be blank/instrument.
4. High resistance grounding (HRG) can't be located in the same section as the main breaker – it must be located in a separate section. HRG can be located in incoming cable or busway pull section.
5. Transformer incoming can be located in the same section as the main breaker – no separate cable pull section is required.

Feeder Sections

Refer to Note 3 for feeder breakers greater than 2000A

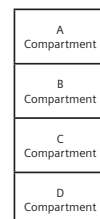
Non-Fused Breakers		Non-Fused Breakers	
Feeder Breaker 800, 1600, 2000 (22.5”)	Feeder Breaker Load Side Cable Pull Section Hinged Door (45.0”)	Blank or Instrument Compartment (22.5”)	Feeder Breaker Load Side Cable Pull Section Hinged Door (45.0”)
Feeder Breaker 800, 1600, 2000 (22.5”)	Hinged Door (37.5”)	Feeder Breaker 3200 (22.5”)	Hinged Door (37.5”)
Feeder Breaker 800, 1600, 2000 (22.5”)	Hinged Door (37.5”)	Blank or Instrument Compartment (45.0”)	Hinged Door (37.5”)
Feeder Breaker 800, 1600, 2000 (22.5”)	Unusable Space (7.5”)		Unusable Space (7.5”)
22” Wide	22”/30”/40” Wide	32” Wide	30”/40” Wide

Non-Fused Breakers		Non-Fused Breakers	
Blank or Instrument Compartment (45.0”)	Feeder Breaker Load Side Cable Pull Section Hinged Door (45.0”)	Blank or Instrument Compartment (22.5”)	Feeder Breaker Load Side Cable Pull Section Hinged Door (45.0”)
Feeder Breaker 3200 (22.5”)	Hinged Door (37.5”)	Feeder Breaker 4000 (22.5”)	Hinged Door (37.5”)
Blank or Instrument Compartment (22.5”)	Hinged Door (37.5”)	Blank or Instrument Compartment (37.5”)	Hinged Door (37.5”)
	Unusable Space (7.5”)	Unusable Space (7.5”)	Unusable Space (7.5”)
32” Wide	30”/40” Wide	32” Wide	30”/40” Wide

Switchgear Depth Dimensional Information: (Dimensions below are for internal frames – not total structure depth)

- Indoor – 39.2”

Section Compartment Arrangement:



Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Feeder and Incoming Section Configurations, Non-Fused Breakers

Note 1

- Main breaker must mount in separate vertical section. Main breaker can mount in Compartment B or Compartment C – not in Compartment A or Compartment D.
- No feeder breakers are allowed in the same section as the main breaker.
- A separate incoming section must be used for incoming busway or incoming cable with FS2 3200A main or tie breaker. Available incoming section width is 32”.

Note 2

- Tie breaker must mount in separate vertical section. Tie breaker can mount in Compartment B or Compartment C – not in Compartment A or Compartment D.
- No feeder breakers are allowed in the same section as the tie breaker.
- Tie breakers are typically through bus connected on the line and load side but can be cable or busway fed also.
- A separate incoming section must be used for incoming busway or incoming cable with FS2 3200A main or tie breaker.

Note 3

- Feeder breakers greater than 2000A must use main breaker design and application guidelines. Consult factory for application support.

Note 4

- Auxiliary compartment may have reduced height and/or depth.

Note 5

- Minimum cable pull section width for 5000A feeder breaker with load side cable going out the top of the cable pull section is 40”

General Notes:

1. All compartments are 22.5” high unless noted otherwise.
2. A blank/instrument compartment can always be substituted for a breaker compartment.
3. For close coupled dry type transformer connections, Compartment A must be blank/instrument.
4. High resistance grounding (HRG) can't be located in the same section as the main breaker – it must be located in a separate section. HRG can be located in incoming cable or busway pull section.
5. Transformer incoming can be located in the same section as the main breaker – no separate cable pull section is required.

Feeder Sections

Refer to Note 3 for feeder breakers greater than 2000A

Non-Fused Breakers		Non-Fused Breakers	
Blank or Instrument Compartment (45.0")	Feeder Breaker Load Side Cable Pull Section Hinged Door (45.0")	Blank or Instrument Compartment (22.5")	Feeder Breaker Load Side Cable Pull Section Refer to Note 5 Hinged Door (45.0")
		Feeder Breaker 5000 (22.5")	
Feeder Breaker 4000 (22.5")	Hinged Door (37.5")	Unusable Space (7.5")	Hinged Door (37.5")
Blank or Instrument Compartment (15.0")		Blank or Instrument Compartment (30.0")	
Unusable Space (7.5")	Unusable Space (7.5")	Unusable Space (7.5")	Unusable Space (7.5")
32" Wide	30"/40" Wide	32" Wide	30"/40" Wide

Non-Fused Breakers	
Blank or Instrument Compartment (45.0")	Feeder Breaker Load Side Cable Pull Section Refer to Note 5 Hinged Door (45.0")
	Hinged Door (37.5")
Unusable Space (7.5")	Unusable Space (7.5")
Unusable Space (15.0")	
32" Wide	30"/40" Wide

Incoming Sections

Blank or Instrument Compartment (45.0")
Blank or Instrument Compartment (37.5")
Unusable Space (7.5")
32" Wide

Switchgear Depth Dimensional Information: (Dimensions below are for internal frames – not total structure depth)

- Indoor – 39.2”

Section Compartment Arrangement:

A Compartment
B Compartment
C Compartment
D Compartment

Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Wall Mount

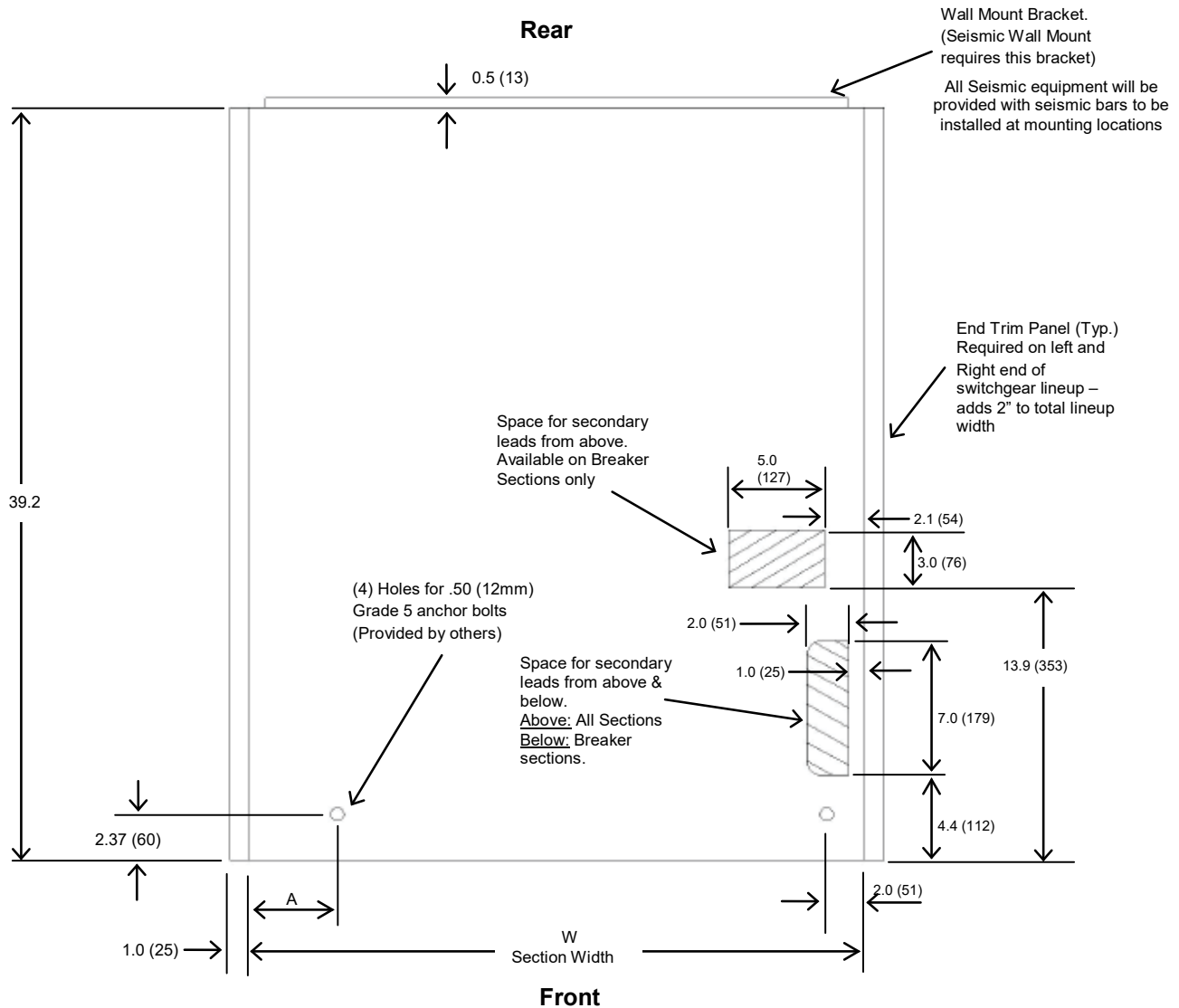


Fig- 1

Plan View

	Breaker Section		Cable Section		
	3 Pole FS2	3 Pole FS3			
Section Width, W	22 (559)	32 (813)	22 (559)	30 (762)	40 (1016)
Front Left Anchor Hole, A	4.09 (104)	2.61 (166)	2.0 (51)	2.0 (51)	2.0 (51)

Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Floor Mount (Requires Rear Access)

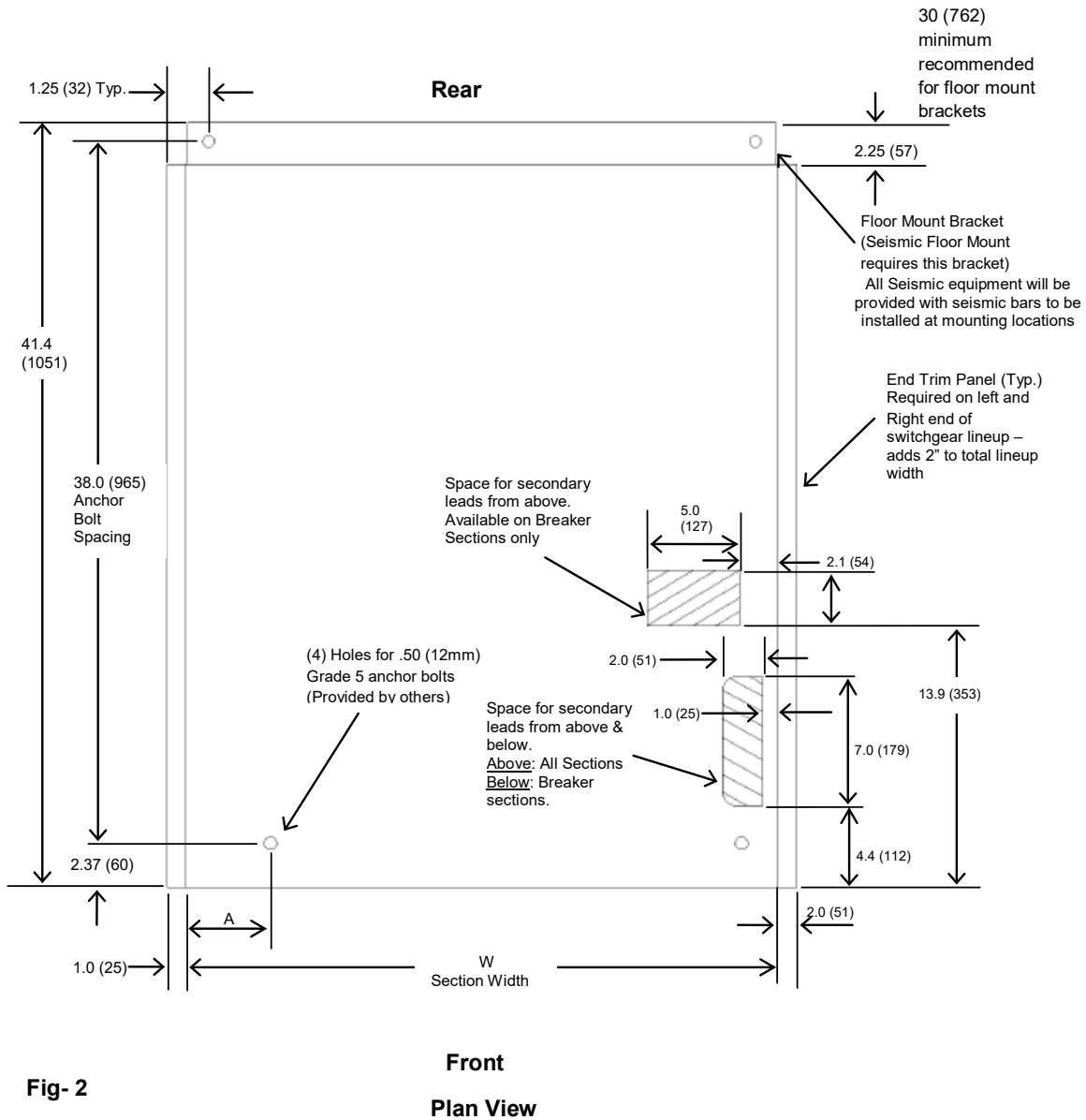


Fig- 2

	Breaker Section		Cable Section		
	3 Pole FS2	3 Pole FS3			
Section Width, W	22 (559)	32 (813)	22 (559)	30 (762)	40 (1016)
Front Left Anchor Hole, A	4.09 (104)	2.61 (166)	2.0 (51)	2.0 (51)	2.0 (51)

Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Side View

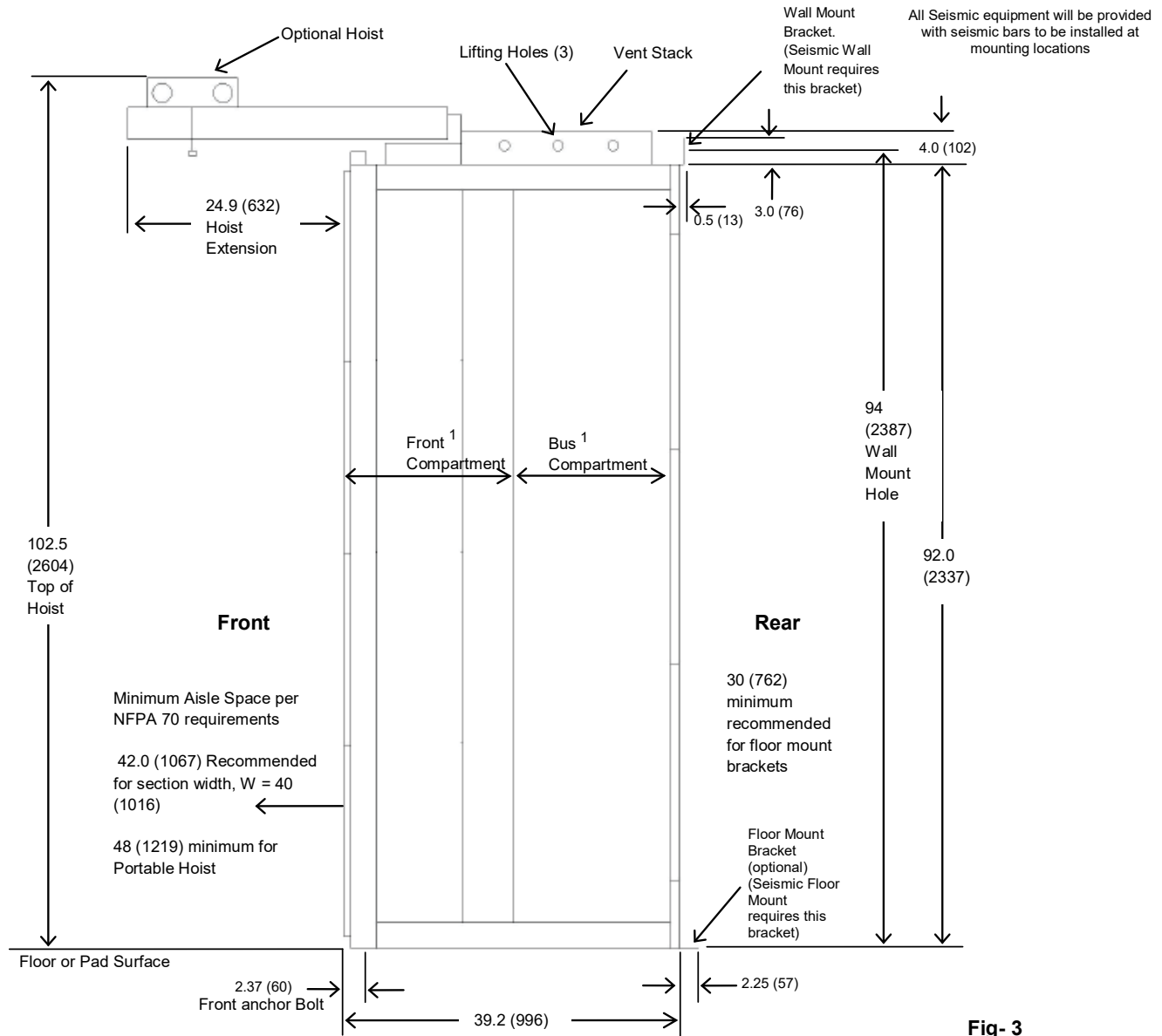


Fig- 3

1

Section Compartment Type	Front Compartment Depth	Bus Compartment Depth
Breaker	19.8 (503)	19.4 (493)
Feeder Cable	28.7 (729)	10.5 (267)

Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Incoming Section – Cable Entry Top

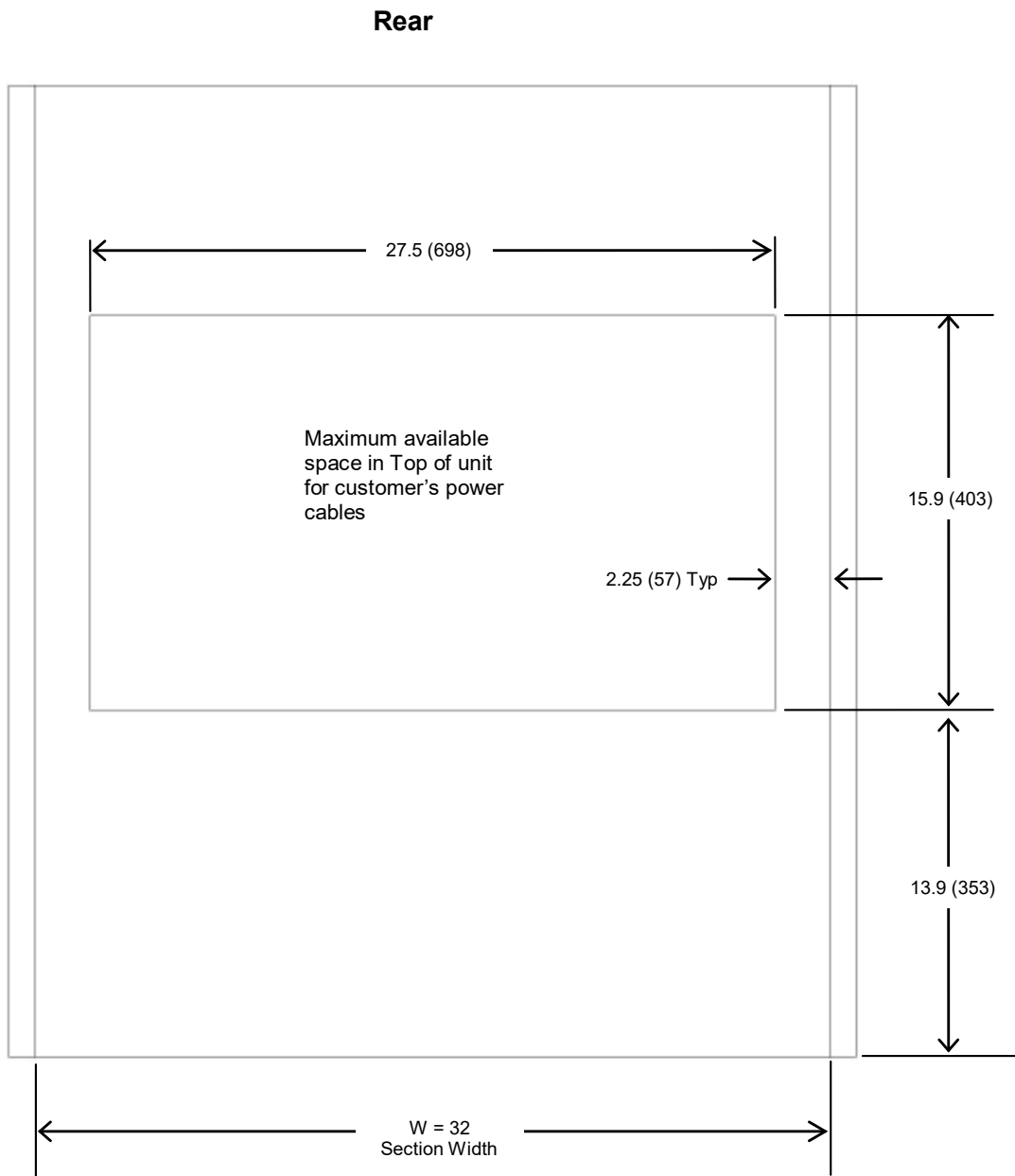


Fig - 4

Front
Plan View

Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Incoming Section – Cable Entry Bottom

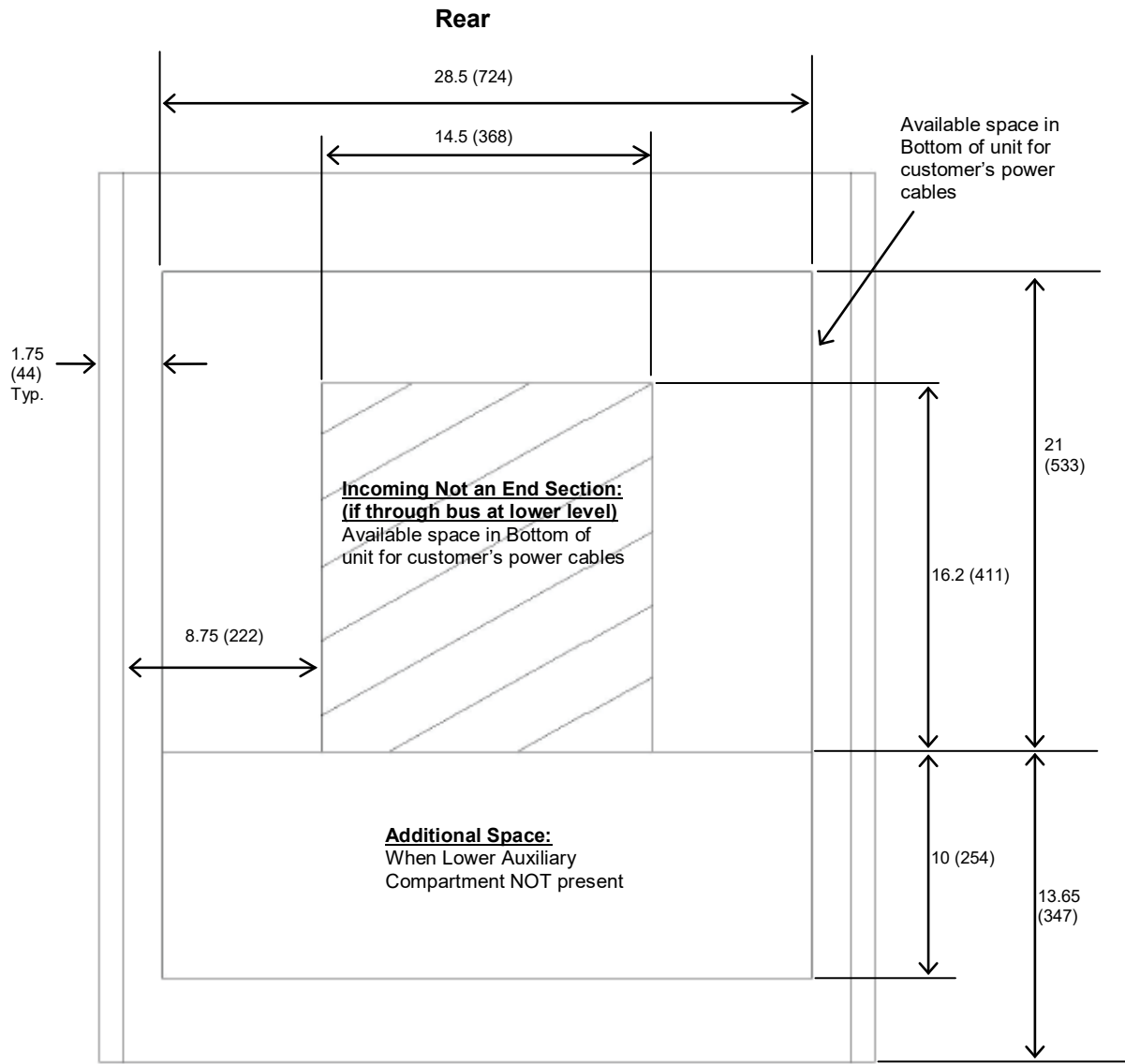


Fig- 5

Front

Plan View

Incoming	Conduit Area Bottom
End Section	28.5 (724) X 21 (533)
Not an End Section & Through Bus at Lower Level (Cables always connect to Top Level Through Bus)	14.5 (368) X 16.2 (411)

Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Left Incoming Section – Sentron Busway Top & Bottom

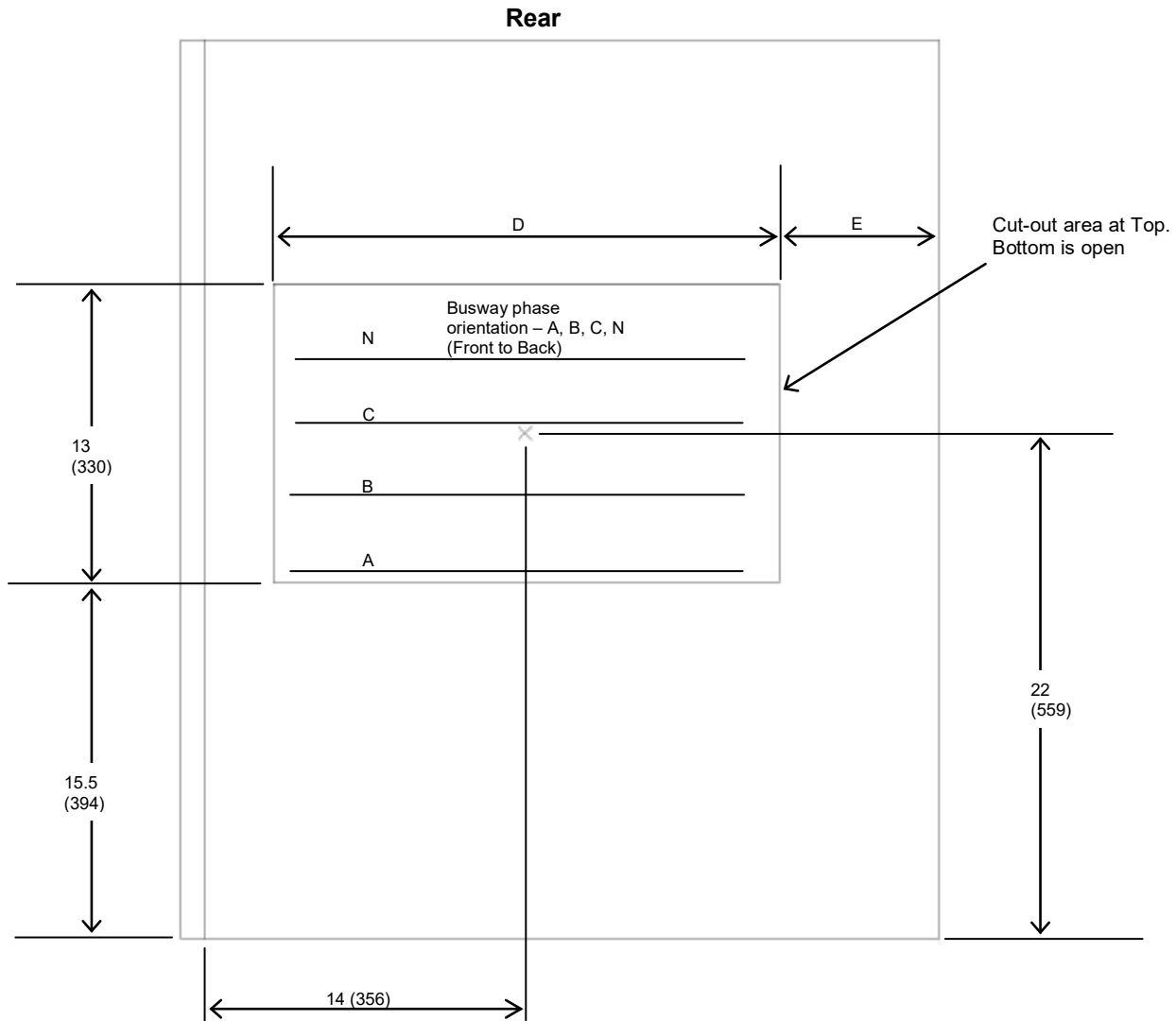


Fig- 6

Front
Plan View

Sentron Busway Plug Rating (Cu)	D	E
5000A	22 (559)	7 (178)
3000A/3200A/4000A	18 (457)	9 (229)
1600A/2000A/2500A	13.5 (343)	11.25 (286)
800A/1000A/1200A	8 (203)	14 (356)

Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Right Incoming – Section Sentron Busway Top & Bottom

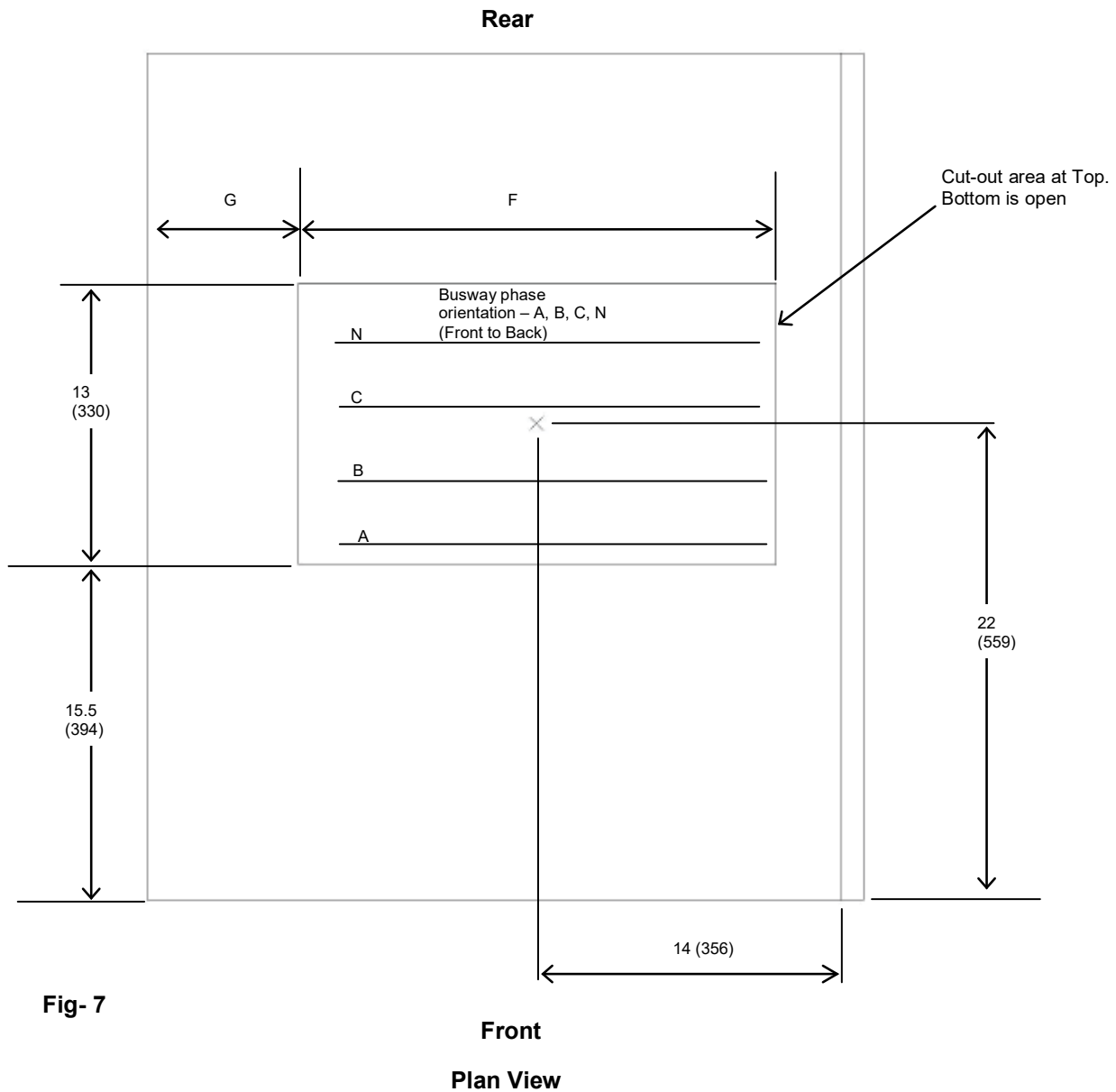


Fig- 7

Sentron Busway Plug Rating (Cu)	F	G
5000A	22 (559)	7 (178)
3000A/3200A/4000A	18 (457)	9 (229)
1600A/2000A/2500A	13.5 (343)	11.25 (286)
800A/1000A/1200A	8 (203)	14 (356)

Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Feeder Cable Section (Area) – Cable Entry Top

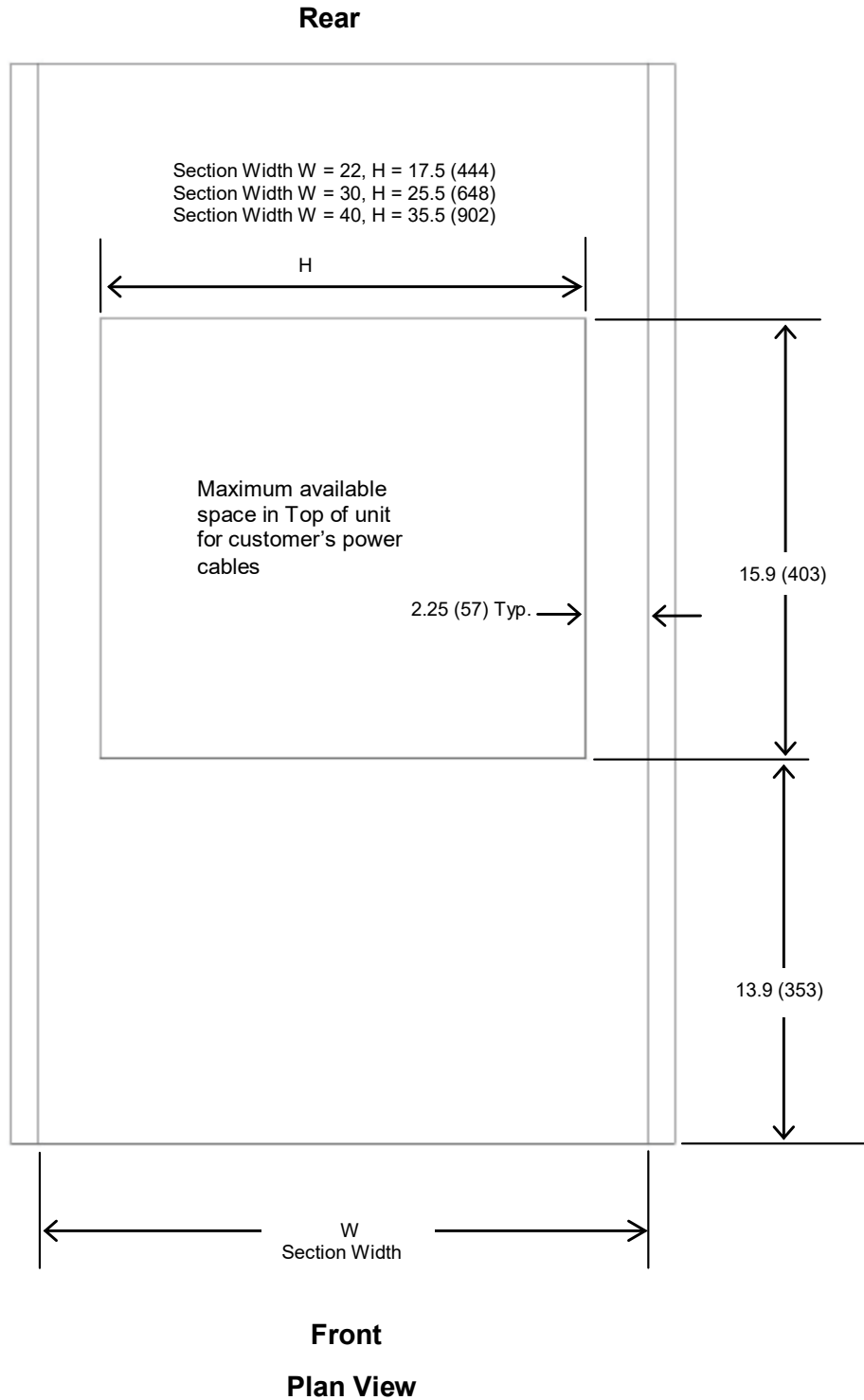


Fig- 8

Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Feeder Cable Section (Area) – Cable Entry Bottom

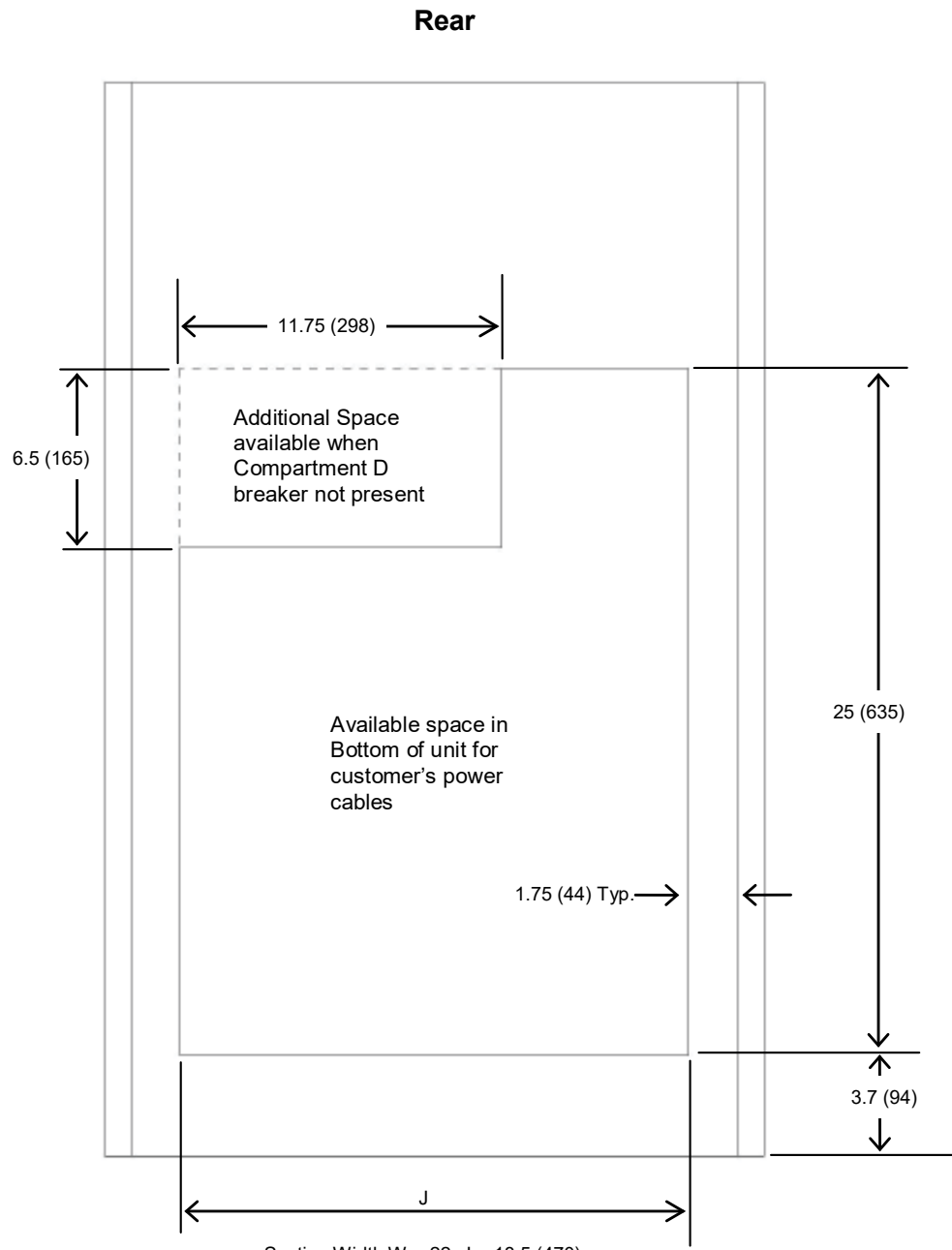


Fig- 9

Section Width W = 22, J = 18.5 (470)
 Section Width W = 30, J = 26.5 (673)
 Section Width W = 40, J = 36.5 (927)

Front
Plan View

Front Connected Type WL Low Voltage Metal-Enclosed Switchgear

Shipping Weights and Dimensional Information

Siemens Type WL Low Voltage Switchgear

can be configured in many ways by combining different section types Up to five vertical sections plus a transition section can be shipped together as a unit Maximum shipping split length for indoor structures is 110 in If all vertical sections are not to be shipped as a unit, specifications need to be provided that describe the limiting factors (e g , low door or narrow hallway).

Normal indoor vertical sections are 96 in. high and 39.2 in. deep.

The major assembly sections include:

- Incoming Sections — used as incoming for cable or bus duct entrance.
- Main Sections — used to contain main breaker and may house metering and feeder sections.
- Feeder Sections — used to contain feeder breakers and other equipment such as instrumentation.
- Tie Sections — used to contain tie breakers and other equipment such as feeder breakers.

Approximate Weight – Lbs.		
Section Type	22" Indoor	32' indoor
Auxiliary	1000	1300
Utility Metering	N/A	N/A
Breaker	1400	2000

Weights shown do not include weight of circuit breaker removable element (but does include cradle)
Add 400 lbs for hoist and track

Note: This guide does not purport to cover all details in equipment, or to provide for every possible contingency. Should further information be desired or should particular problems arise, which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the local Siemens sales office. The contents of this guide shall not become part of or modify any prior or existing agreement, commitment or relationship.

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Siemens Industry, Inc.
5400 Triangle Parkway
Norcross, GA 30092

1-800-241-4453
info.us@siemens.com

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