Engineered Solutions

The Engineered Solutions program takes Mitsubishi Electric's high-performance control products and packages them into ready-to-use solutions ranging from a simple 'drive in a box' to a complex multi-axis CNC or Servo control system. Systems can be designed and built collaboratively, or to your exact specifications.

Standard Engineered Solutions

Based on many years of practical industry experience, standard engineered solutions are pre-engineered to meet the needs of a wide range of different applications within industrial, agricultural and commercial sectors including fan and pump standard control packages, ensuring you low cost and quick delivery.

Custom Engineered Solutions

Mitsubishi Electric US, Industrial Automation designs and constructs fully customized, engineered solutions that meet the most exacting specifications. A custom-packaged solution could range from a single enclosure to a complete shipping container full of pre-commissioned control equipment, and can be made to U.S. or global requirements.

Every package is supplied with full documentation and is backed by a comprehensive 2-year warranty.

Custom Engineered Solutions Offer:

- Competitive and innovative designs
- Solutions built collaborative or to your exact specifications
- Integrated VFD panels from 1/8 HP to 1000 HP
- Support from factory-trained engineers
- Help with interpreting specifications
- Global standards compliance – UL, cUL, CSA, CE
- Full documentation, including AutoCAD drawings
- Designs archived for future reference or repeat orders
- Field installation and start-up services
- A full range of Mitsubishi Electric equipment integrated with third-party products
- Technical support and advice from throughout the engineering process
- Complete solutions covered by a 2-year warranty

Custom engineered solutions offer the performance and reliability you'd expect from Mitsubishi Electric products in packages tailored to your exact specifications.

FreeFlow

Advanced Anti-Clogging Pump Panel System

FreeFlow – NEMA 3R, NEMA 12

Base System Includes:

- Single (1) FR-F800 VFD with keypad programming
- Radio noise filter
- 3 or 4-contactor (horsepower dependent) bypass with TEST mode
- Non-bypass, manual bypass, and auto bypass versions
- RS 485 communications: BACnet, MSTP, and MODBUS RTU
- GT2500 Series HMI: NEMA 3R 7" display, NEMA 12 10" display
- FX5 PLC
- Standard front of panel controls include:
- Hand/off/auto switch (HOA)
- Start and stop button
- Speed potentiometer
- VFD bypass (VOB)
- Emergency stop push button
- Mitsubishi Electric's "Energy Optimization" system
- 2 independent PID control loops
- 4 – 20mA programmable output signal
- UL489 circuit breaker or fused disconnect option
- 2 year panel system warranty

Options:

- 5% Input reactor (under 150 HP)
- Dual VFD drive
- EtherNet/IP communication protocol
- PROFINET communication protocol
- 3-contactor bypass with overload and manual control
- 3-contactor bypass with overload and auto control
- Manual cleaning switch door mounted
- AC output reactor
- DC bus choke (below 55kW or 75 HP)
- Enclosure heater (-20°C ambient temperature applications only)

Key Benefits:

- 3-contactor bypass standard to 40 HP, 4-contactor bypass for 50 HP and above standard
- NEMA 12 (indoor) or NEMA 3 (outdoor) enclosure option
- Choice of 65kA fused disconnect or UL489 circuit breaker
- Voltage options include 200 – 240 VAC, 440 – 480 VAC, and 550 – 600 VAC
- Non-bypass, manual bypass or auto bypass options available
- Single or dual drive option available
- Horsepower range of 5 HP through 250 HP
- Built-in and automatic anti-clogging feature via a programmed routine that eliminates manual cleaning of debris
- Auto-tuning feature eliminates the need to program the VFD based on application requirements
- Included GT2500 Series HMI enables programming, visualization of all critical system data, data logging, troubleshooting, and manual storage
- Included FX5 PLC enables advanced pump control through external inputs and outputs beyond the capability of the VFD

For More Information

Please refer to the catalog for more details:

FREEFLOW CATALOG

Contact Engineered Solutions for support.

FreeFlow How-to-Order Code

The following should be used to configure a given FreeFlow panel to the application requirements.

FF [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

Symbol	Configured Panel
FF	FreeFlow

Symbol	Enclosure Type & Display
2	NEMA 12: 10.1" HMI
3	NEMA 3R: 7" HMI

Symbol	Disconnect Type
C (*2)	UL 489 circuit breaker
F	Fused disconnect (65kA SCCR)

Symbol	Input Voltage
2*	200–240V
4	440–480V
6	550–600V

* Limited to 100 HP maximum

Symbol	Drive Quantity
1 (*1)	(1) VFD
2 (*1)	(2) VFD

Symbol	HP Rating
005	5 HP
007	7.5 HP
010	10 HP
015	15 HP
020	20 HP
025	25 HP
030	30 HP
040	40 HP
050	50 HP
060	60 HP
075	75 HP
100	100 HP
125	125 HP
150	150 HP
200	200 HP
250	250 HP

Symbol	Bypass Type
N	Non-bypass
M	Manual bypass
A	Auto bypass

Symbol	Network Options
R	Modbus® RTU
B	BACnet® MSTP
E	EtherNet/IP™
P	PROFINET®

Symbol	Options: Multiple or all can be selected
Blank	No options selected
A	3-contactor bypass with overload and manual control
B (*3)	3-contactor bypass with overload and auto control
C	Manual cleaning switch, door mounted
D	5% AC input reactor (under 150 HP)
E	AC output reactor
F	DC Bus Choke (below 55Kw or 75 HP)
G	Enclosure heater (-20°C ambient applications only)
H	Units selected with fused disconnect option requirement for semi-conductor fuses

Additional Ordering Information

Standard front of panel switches include:

- Hand/off/auto switch (HOA)
- Start and stop button
- Speed potentiometer
- VFD bypass (VOB)
- Emergency stop push button

Code Notes

*1. Drive Quantity Option(s):

- Up to 40 HP limited to (1) VFD for auto-bypass and non-bypass option
- 50HP and above can be ordered with (2) VFDs. (1) VFD for non-bypass

*2. C Option Disconnect Type:

- 240V: 15 HP not available in manual or auto bypass option. Use fused disconnect option
- 460V: 5 and 7.5 HP options use 35kA for circuit breaker, 65kA for fused disconnect option
- 460V: 150 HP and 250 HP not available in manual or auto bypass option. Use fused disconnect option

*3. B Option:

- Up to 40 HP utilizes a 3-contactor bypass standard
- 50 HP and above utilize a 4-contactor bypass standard
- No overload included, VFD acts as the overload protection device

PowerGate 'H' Series HVAC Bypass and Non-Bypass Controllers – NEMA 1, NEMA 12, NEMA 3R

Base System Includes:

- Radio Noise Filter
- 3 contactor bypass standard
- Non-bypass and Manual bypass versions
- Bi-Directional 'Anti-Windmill' feature
- Adjustable Class 20 overload relay
- DC Link Choke
- RS-485 Communications: BACnet MS/TP and MODBUS RTU
- Mitsubishi Electric's 'Energy Optimization' System
- 5 second power dip ride-through
- 2 independent PID control loops
- 4–20mA programmable analog output signal
- For NEMA 3R Controllers:
  - Thermostatic anti-condensation control
  - Screened entrance for cooling air
  - White heat-reflective paint
- 65kA SCCR short circuit rating
- 2 year warranty
- 5 year warranty available with Start-Up service

Options:

- Input Reactor (3 or 5%)
- Damper vane control
- Extended analog outputs
- Hand-off-auto with potentiometer
- Programming and display keypad and speed setting dial
- Alpha-numeric keypad with real-time clock
- For NEMA 3R versions: Stainless steel enclosures
- Extended Communications:
  - Metasys® N2
  - LonWorks®
  - Siemens FLN (P1, Apogee®)
  - EtherNet/IP™
  - MODBUS® TCP/IP
  - BACnet® IP
  - PROFINET®

PowerGate H: How-to-Order Code

H □ □ □ ▭ □ □ □ □

Symbol	Horsepower Rating
001 – 250	1 – 250 HP* NEMA 1
001 – 1000	1 – 600 HP* NEMA 12
001 – 1000	1 – 600 HP* NEMA 3R

* Maximum HP varies according to voltage and enclosure type.

Symbol	Input Voltage
2	208 – 240V
4	380 – 480V
6	472 – 660V

Symbol	Disconnect Type
C	UL489 Circuit Breaker
F	Fused Disconnect (200kA) (option)
N	Non Fused Disconnect (Not available NEMA 1)

Symbol	Enclosure Type
1	NEMA 1
2	NEMA 12
3	NEMA 3R

Symbol	Choke/Reactor Type
D	DC Link Choke (included)
3	3% Input Reactor (option)
5	5% Input Reactor (option)

Note: 3% and 5% input reactors are available in non-bypass NEMA 1. Consult factory for pricing.

Symbol	Bypass Type
N	Non-Bypass
B	Basic Bypass

Symbol	Options
A	Damper Vane Actuator Relay Fitted
B*	Hand-Off-Auto Switch with Potentiometer (Not available in Basic Bypass)
C	Extended Analog Output
G	Alphanumeric Keypad
F**	120 Watt Enclosure Heater
I**	Stop / Start / Reset
K**	E-stop Pushbutton
M**	Power On / Fault / Running / Pilot Light
P**	BYPASS Pilot Light
Q**	Surge Arrestor
S**	Hour Meter
T**	Drive Trip/Run Relay (Non-bypass Only)

Up to 7 options may be selected.
Contact the sales office if more than 7 options are required.
* Not available in basic bypass
** Not available in H1-NEMA1

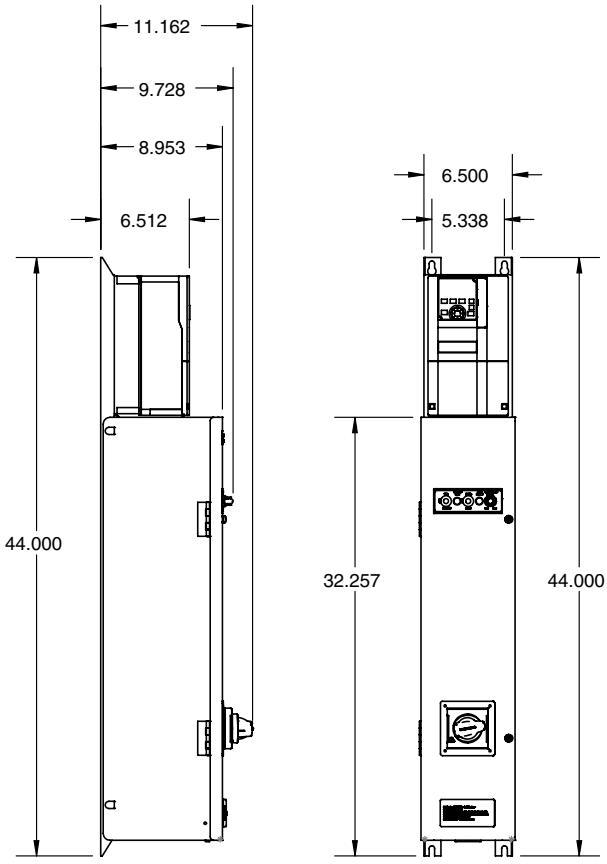
Symbol	Network Type*
R	Enhanced RS-485 capability Siemens FLN, Metasys N2 (Modbus RTU and BACnet, MS/TP are standard)
L	LONWORKS
E	Ethernet Communications (EtherNet/IP, Modbus TCP/IP, BACnet IP, PROFINET)

Select one option if required.
* For current network list, please contact sales.

PowerGate 'H' Series VFD Basic Bypass System – NEMA 1

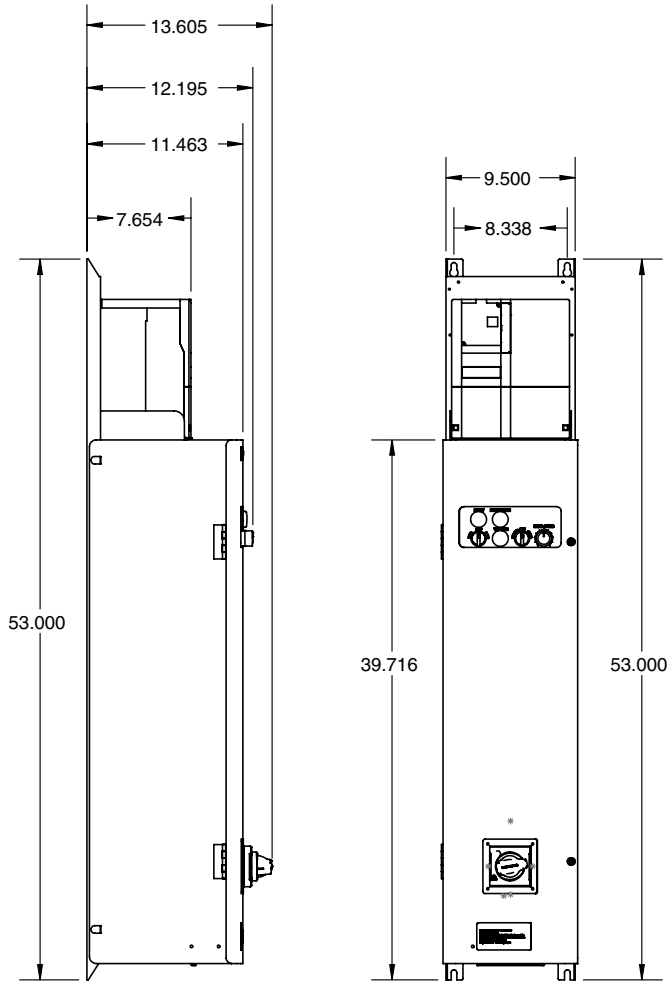
Basic Product with Circuit Breaker & 3 Contactor Bypass VFD System		208V–240V Based VFD System		Panel Size	480V Based VFD System		Panel Size	600V Based VFD System		Panel Size
hp	kW	Model Number	Amps		Model Number	Amps		Model Number	Amps	
1	1	**H1C2001BD**	4.6	N1A	**H1C4001BD**	2.3	N1A	**H1C6001BD**	2.7	N1A
2	1.5	**H1C2002BD**	7.7		**H1C4002BD**	3.8		**H1C6002BD**	2.7	
3	2.2	**H1C2003BD**	10.5		**H1C4003BD**	5.2		**H1C6003BD**	2.7	
5	3.7	**H1C2005BD**	16.7		**H1C4005BD**	8.3		**H1C6005BD**	6.1	
7.5	5.5	**H1C2007BD**	25		**H1C4007BD**	12.6		**H1C6007BD**	9	
10	7.5	**H1C2010BD**	34	N1B	**H1C4010BD**	17	N1B	**H1C6010BD**	17	N1B
15	11	**H1C2015BD**	49		**H1C4015BD**	25		**H1C6015BD**	17	
20	15	**H1C2020BD**	63		**H1C4020BD**	31		**H1C6020BD**	32	
25	18.5	**H1C2025BD**	74.8	N1C	**H1C4025BD**	38		**H1C6025BD**	32	
30	22	**H1C2030BD**	88		**H1C4030BD**	40	N1C	**H1C6030BD**	32	N1C
40	30	**H1C2040BD**	125	N1D	**H1C4040BD**	52		**H1C6040BD**	45	
50	37	N/A	N/A	N/A	**H1C4050BD**	70	N1D	**H1C6050BD**	68	N1D
60	45	N/A	N/A		**H1C4060BD**	85		**H1C6060BD**	68	
75	55	N/A	N/A		**H1C4075BD**	106		**H1C6075BD**	108	

System Dimensions
240V: 1, 2, 3, 5, & 7.5 HP
480V: 1, 2, 3, 5, & 7.5 HP
600V: 1, 2, 3, 5, & 7.5 HP



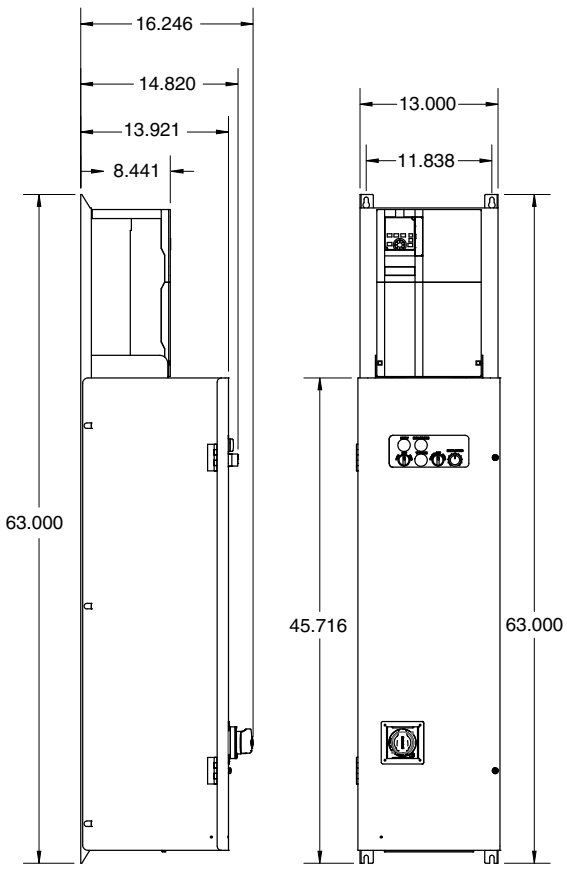
N1A

System Dimensions
240V: 10, 15, & 20 HP
480V: 10, 15, 20, & 25 HP
600V: 10, 15, 20, & 25 HP



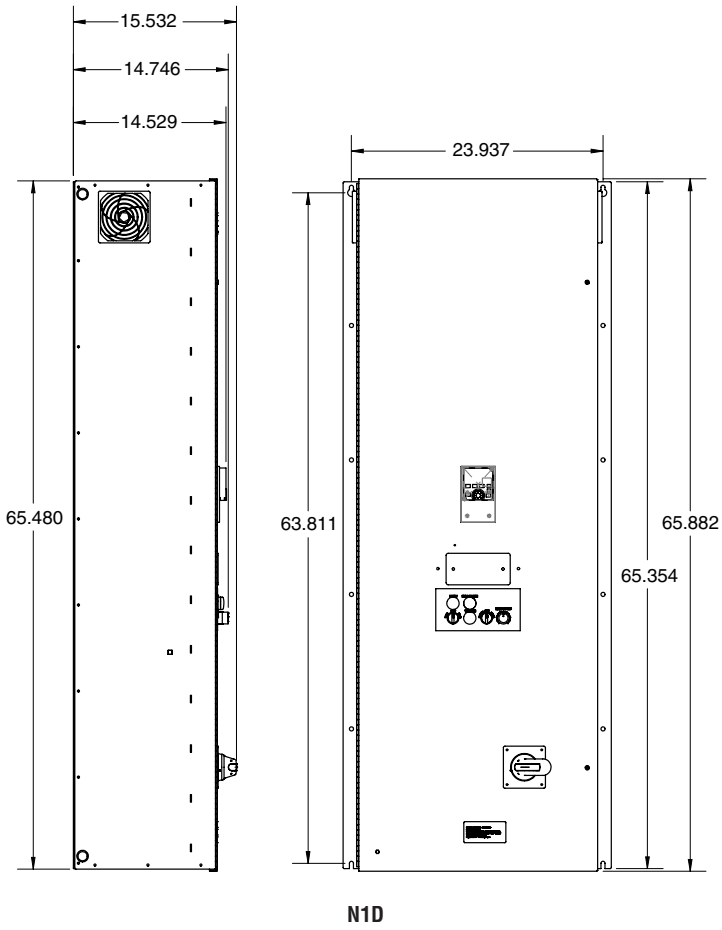
N1B

System Dimensions
240V: 25 & 30 HP
480V: 30 & 40 HP
600V: 40 HP



N1C

System Dimensions
240V: 40 HP
480V: 50, 60, & 75 HP
600V: 50, 60, & 75 HP

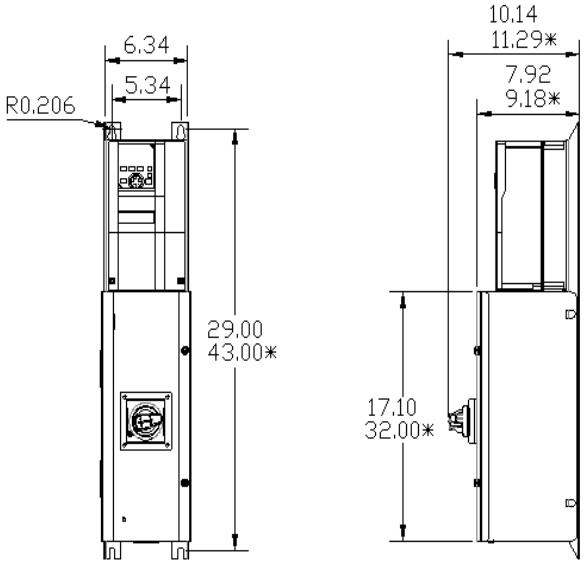


N1D

PowerGate 'H' Series VFD Non-Bypass System – NEMA 1

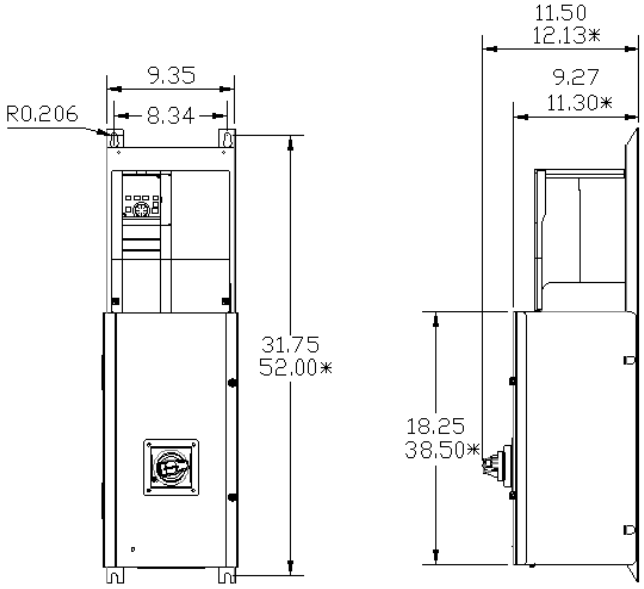
Standard Product with Circuit Breaker Non-Bypass VFD System		208V–240V Based VFD System		Panel Size	480V Based VFD System		Panel Size	600V Based VFD System		Panel Size
hp	kW	Model Number	Amps		Model Number	Amps		Model Number	Amps	
1	1	**H1C2001ND**	4.6		**H1C4001ND**	2.3		**H1C6001ND**	2.7	
2	1.5	**H1C2002ND**	7.7		**H1C4002ND**	3.8		**H1C6002ND**	2.7	
3	2.2	**H1C2003ND**	10.6	N1A	**H1C4003ND**	5.2	N1A	**H1C6003ND**	6.1	N1A
5	3.7	**H1C2005ND**	16.7		**H1C4005ND**	8		**H1C6005ND**	6.1	
7.5	5.5	**H1C2007ND**	25		**H1C4007ND**	12.6		**H1C6007ND**	9	
10	7.5	**H1C2010ND**	34		**H1C4010ND**	17		**H1C6010ND**	17	
15	11	**H1C2015ND**	49	N1B	**H1C4015ND**	25	N1B	**H1C6015ND**	17	
20	15	**H1C2020ND**	63		**H1C4020ND**	31		**H1C6020ND**	32	N1B
25	18.5	**H1C2025ND**	77	N1C	**H1C4025BND**	38		**H1C6025ND**	32	
30	22	**H1C2030ND**	93		**H1C4030ND**	47	N1C	**H1C6030ND**	32	
40	30	**H1C2040ND**	125	N1D	**H1C4040ND**	62		**H1C6040ND**	45	N1C
50	37	N/A	N/A	N/A	**H1C4050ND**	77		**H1C6050ND**	68	
60	45	N/A	N/A	N/A	**H1C4060ND**	96	N1D	**H1C6060ND**	68	N1D
75	55	N/A	N/A	N/A	**H1C4075ND**	116		**H1C6075ND**	108	

System Dimensions (*1):
240V: 1, 2, 3, 5, & 7.5 HP
480V: 1, 2, 3, 5, & 7.5 HP
600V: 1, 2, 3, 5, & 7.5 HP



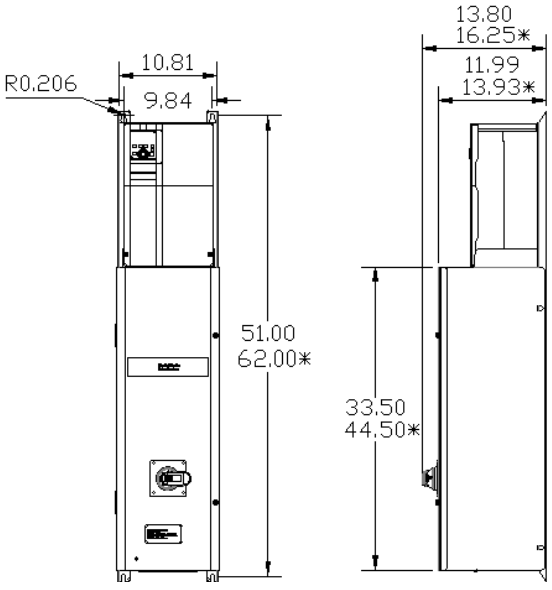
N1A

System Dimensions (*1):
240V: 10, 15, & 20 HP
480V: 10, 15, 20, & 25 HP
600V: 10, 15, 20, 25, & 30 HP



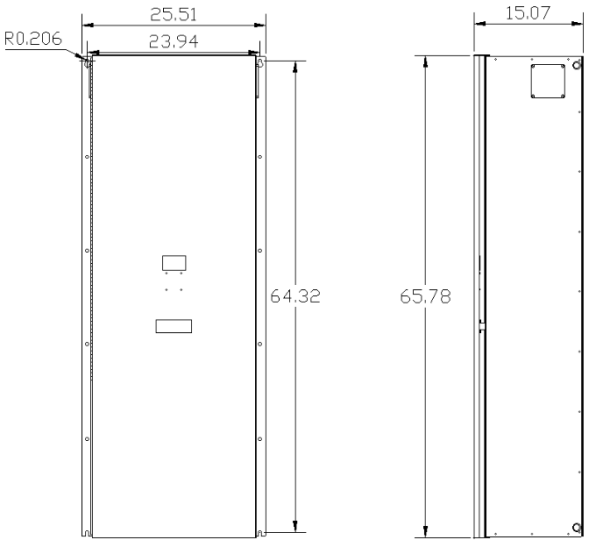
N1B

System Dimensions (*1):
240V: 25 & 30 HP
480V: 30 & 40 HP
600V: 40 HP



N1C

System Dimensions
240V: 40 HP
480V: 50, 60, & 75 HP
600V: 50, 60, & 75 HP



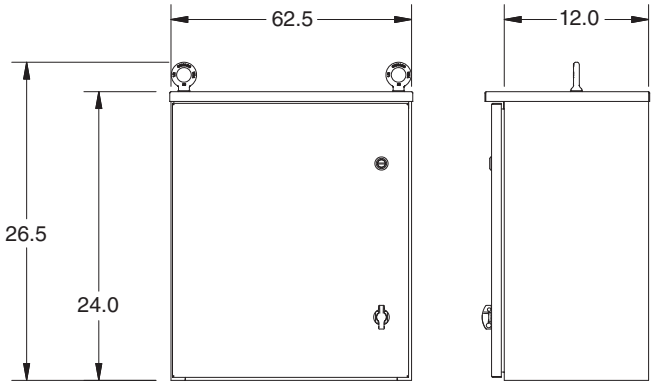
N1D

* **Note 1:** Larger dimensions are for models with 3% and 5% line reactors.

PowerGate 'H' Series Non-Bypass System – NEMA 12

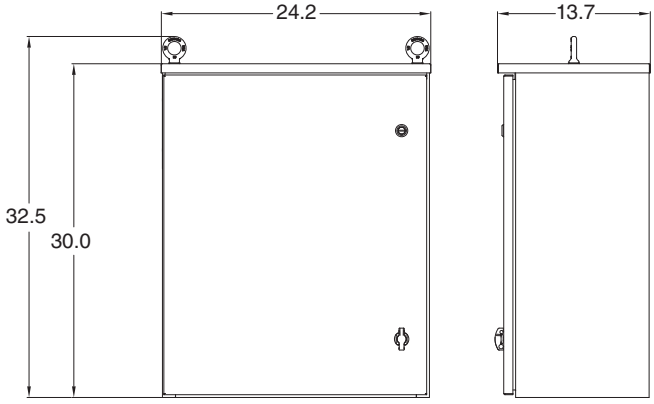
Non-Bypass with Circuit Breaker		208V–240V Based VFD System		Panel Size	460V Based VFD System		Panel Size
VFD System hp	kW	Model Number	Amps		Model Number	Amps	
1	1	**H2C2001N**	4.6	N12A	**H2C4001N**	2.3	N12A
2	1.5	**H2C2002N**	7.7		**H2C4002N**	3.8	
3	2.2	**H2C2003N**	10.5		**H2C4003N**	5.2	
5	3.7	**H2C2005N**	16.7		**H2C4005N**	8.3	
7.5	5.5	**H2C2007N**	25.0		**H2C4007N**	12.6	
10	7.5	**H2C2010N**	34.0	N12B	**H2C4010N**	17.0	N12B
15	11.0	**H2C2015N**	49.0		**H2C4015N**	25.0	
20	15.0	**H2C2020N**	63.0		**H2C4020N**	31.0	
25	18.5	**H2C2025N**	77.0		**H2C4025N**	38.0	
30	22.0	**H2C2030N**	88.0		**H2C4030N**	47.0	
40	30.0	**H2C2040N**	125.0		**H2C4040N**	62.0	
50	37.0	**H2C2050N**	154.0	N12C	**H2C4050N**	77.0	N12C
60	45.0	**H2C2060N**	187.0	N12D	**H2C4060N**	93.0	N12D
75	55.0	**H2C2075N**	233.0		**H2C4075N**	116.0	
100	75.0	**H2C2100N**	316.0	N12F	**H2C4100N**	158.0	
125	90.0	**H2C2125N**	380.0		**H2C4125N**	180.0	
150	110.0	**H2C2150N**	475.0		**H2C4150N**	216.0	N12E
200	150.0	N/A	N/A	N/A	**H2C4200N**	260.0	
250	185.0	N/A	N/A	N/A	**H2C4250N**	325.0	N12F
300	225.0	N/A	N/A	N/A	**H2C4300N**	361.0	
350	260.0	N/A	N/A	N/A	**H2C4350N**	432.0	N12G
400	300.0	N/A	N/A	N/A	**H2C4400N**	481.0	
450	335.0	N/A	N/A	N/A	**H2C4450N**	547.0	
500	373.0	N/A	N/A	N/A	**H2C4500N**	610.0	
600	447.0	N/A	N/A	N/A	**H2C4600N**	683.0	

System Dimensions
240V: 1, 2, 3, 4, 5, 7.5 HP
480V: 1, 2, 3, 4, 5, 7.5 HP
No 600V available



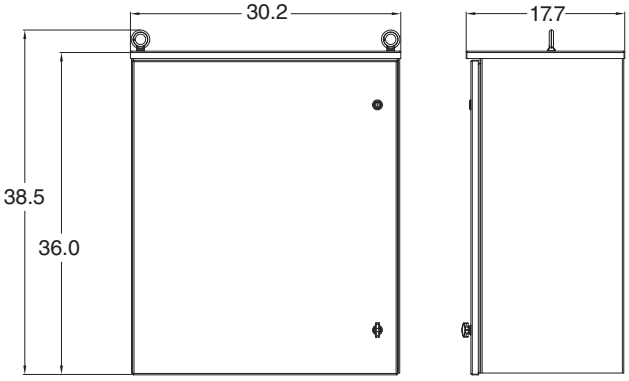
N12A

System Dimensions
240V: 10, 15, 20, 25, 30, & 40 HP
480V: 10, 15, 20, 25, 30, & 40 HP
No 600V available



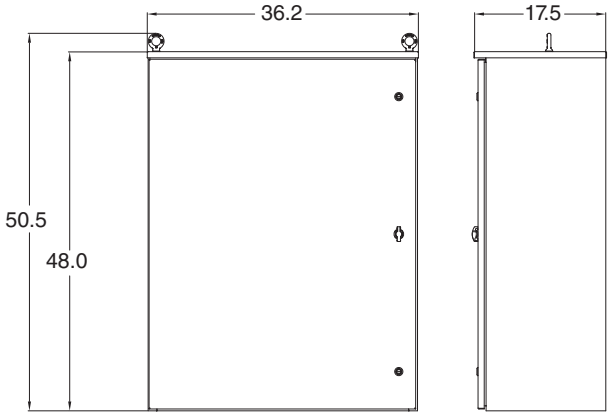
N12B

System Dimensions
240V: 50 HP
480V: 50 HP
No 600V available



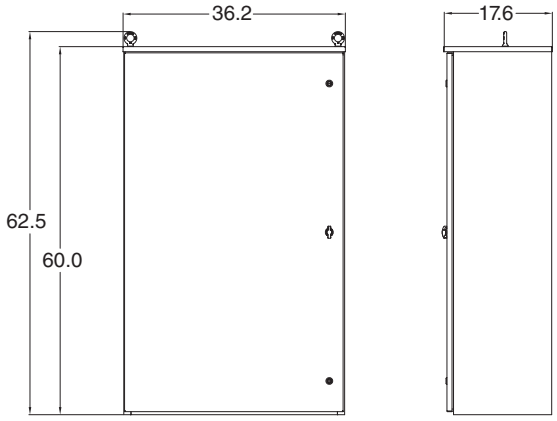
N12C

System Dimensions
240V: 60 & 75 HP
480V: 60, 75, 100, & 125 HP
No 600V available



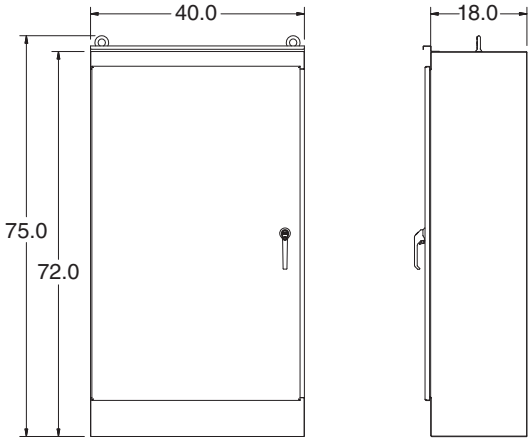
N12D

System Dimensions
480V: 150 & 200 HP



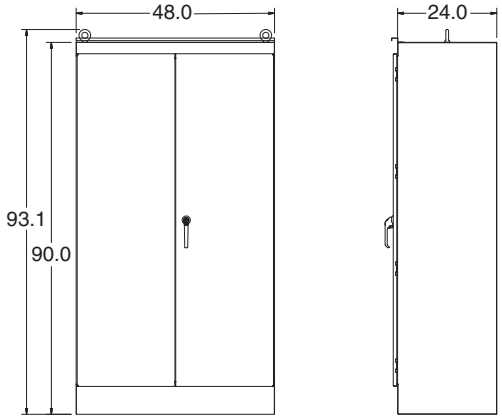
N12E

System Dimensions
480V: 250 & 300 HP



N12F

System Dimensions
480V: 350, 400, 450, 500, & 600 HP

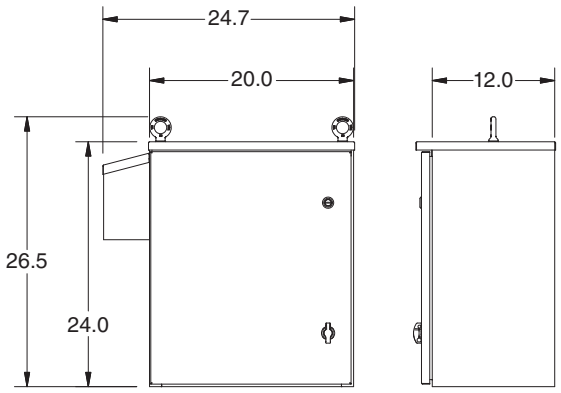


N12G

PowerGate 'H' Series Non-Bypass Systems – NEMA 3R

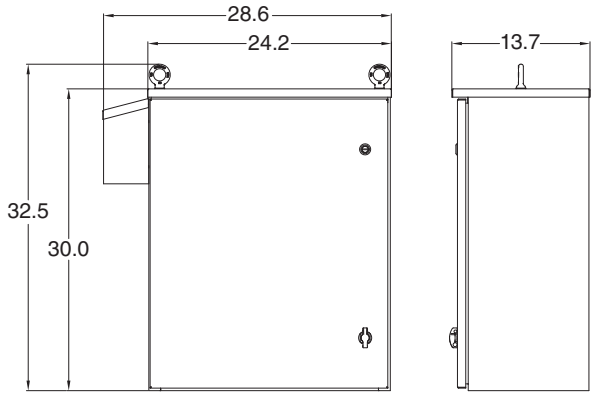
Standard Product with Circuit Breaker		208V–240V Based VFD System		Panel Size	480V Based VFD System		Panel Size	600V Based VFD System		Panel Size
hp	kW	Model Number	Amps		Model Number	Amps		Model Number	Amps	
1	1	**H3C2001ND**	4.6	N3RA	**H3C4001N**	2.3	N3RA	**H3C6001N**	2.3	N3RA
2	1.5	**H3C2002ND**	7.7		**H3C4002N**	3.8		**H3C6002N**	3.8	
3	2.2	**H3C2003ND**	10.6		**H3C4003N**	5.2		**H3C6003N**	5.2	
5	3.7	**H3C2005ND**	16.7		**H3C4005N**	8.3		**H3C6005N**	8.3	
7.5	5.5	**H3C2007ND**	25.0		**H3C4007N**	12.6		**H3C6007N**	12.6	
10	7.5	**H3C2010ND**	34.0	N3RB	**H3C4010N**	17.0	N3RB	**H3C6010N**	17.0	N3RB
15	11	**H3C2015ND**	49.0		**H3C4015N**	25.0		**H3C6015N**	25.0	
20	15	**H3C2020ND**	63.0		**H3C4020N**	31.0		**H3C6020N**	31.0	
25	18.5	**H3C2025ND**	77.0		**H3C4025N**	38.0		**H3C6025N**	38.0	
30	22	**H3C2030ND**	93.0		**H3C4030N**	47.0		**H3C6030N**	47.0	
40	30	**H3C2040ND**	125.0		**H3C4040N**	62.0		**H3C6040N**	62.0	
50	37	**H3C2050ND**	154.0	N3RC	**H3C4050N**	77.0	N3RC	**H3C6050N**	77.0	N3RC
60	45	**H3C2060ND**	187.0	N3RD	**H3C4060N**	93.0	N3RD	**H3C6060N**	93.0	N3RD
75	55	**H3C2075ND**	233.0		**H3C4075N**	116.0		**H3C6075N**	116.0	
100	75	**H3C2100ND**	316.0	N3RF	**H3C4100N**	TBD		**H3C6100N**	TBD	
125	90	**H3C2125ND**	380.0		**H3C4125N**	180.0		**H3C6125N**	180.0	
150	110	**H3C2150ND**	475.0		**H3C4150N**	216.0	N3RE	**H3C6150N**	216.0	N3RE
200	150	N/A	N/A	N/A	**H3C4200N**	260.0		**H3C6200N**	260.0	
250	185				**H3C4250N**	325.0	N3RF	**H3C6250N**	325.0	N3RF
300	225				**H3C4300N**	361.0		**H3C6300N**	361.0	
350	260				**H3C4350N**	432.0	N3RG	**H3C6350N**	432.0	N3RG
400	300				**H3C4400N**	481.0		**H3C6400N**	481.0	
450	335				**H3C4450N**	547.0		**H3C6450N**	547.0	
500	373				**H3C4500N**	610.0		**H3C6500N**	610.0	
600	447				**H3C4600N**	683.0		**H3C6600N**	683.0	

System Dimensions
240V: 1, 2, 3, 5, & 7.5 HP
480V: 1, 2, 3, 5, & 7.5 HP
600V: 1, 2, 3, 5, & 7.5 HP



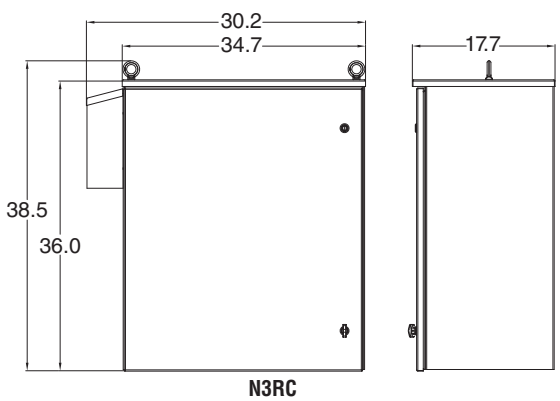
N3RA

System Dimensions
240V: 10, 15, 20, 25, 30, & 40 HP
480V: 10, 15, 20, 25, 30, & 40 HP
600V: 10, 15, 20, 25, 30, & 40 HP



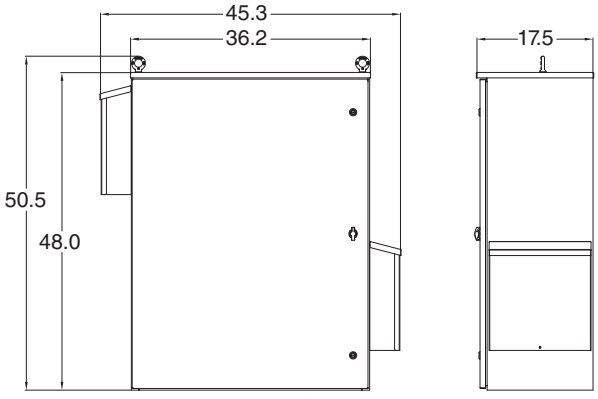
N3RB

System Dimensions
240V: 50 HP
480V: 50 HP
600V: 50 HP



N3RC

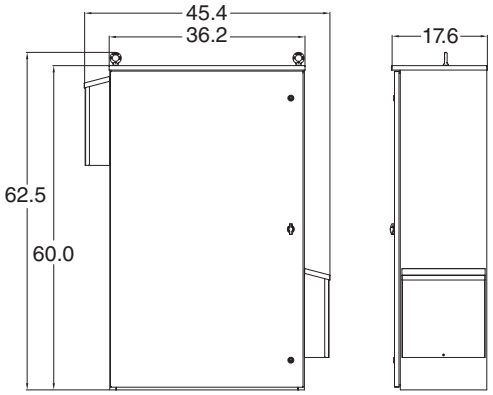
System Dimensions
240V: 60 & 75 HP
480V: 60, 75, 100, & 125 HP
600V: 60, 75, 100, & 125 HP



N3RD

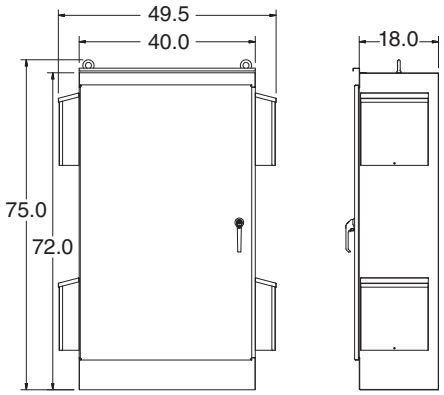
PowerGate 'H' Series VFD Bypass System – NEMA 3R

System Dimensions
240V: N/A
480V: 150 & 200 HP
600V: 150 & 20 HP



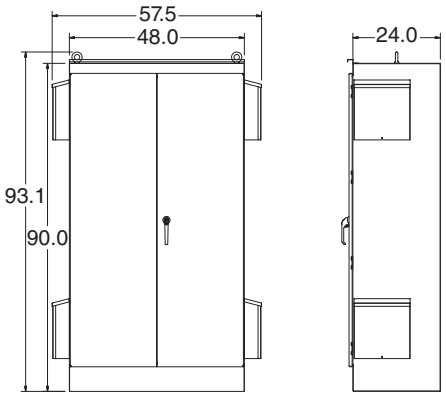
N3RE

System Dimensions
480V: 250 &300 HP
600V: 250 & 300 HP



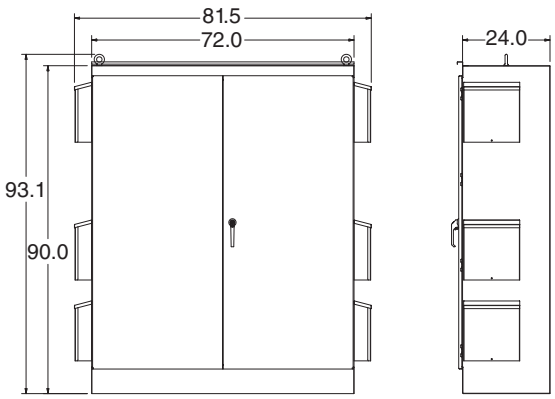
N3RF

System Dimensions
480V: 350, 400, 450, 500, & 600 HP
600V: 350, 400, 450, 500, & 600 HP



N3RG

System Dimensions
480V: 350, 400, 450, 500, & 600 HP
600V: 350, 400, 450, 500, & 600 HP



N3RH

Mitsubishi Electric US, Industrial Automation PowerGate H Electrical Data (208V – 240V)

System hp	Circuit Breaker		Fused Disconnect				DC Choke (MTE or Equivalent)		3% Reactor (MTE or Equivalent)		5% Reactor (MTE or Equivalent)		Overload (Mitsubishi or Equivalent)	O/L	
	Amp	AIC	Switch Max Amps	Fuse Amps	Fuse Class	AIC								Range	Preset
1	15	50kA	30	10	J	200kA	DCA00402	4A, 12mH	RLW-04P801	4.8A, 2.3mH	RLW-07P603	7.6A, 3mH	MT-32/3D5	4.0-6.0A	4.6A
2	15	50kA	30	15	J	200kA	DCA001202	12A, 2.1mH	RLW-07P601	7.6A, 1.5mH	RLW-001103	11A, 2.1mH	MT-32/3D7.5	5.2-8.0A	7.5A
3	25	50kA	30	20	J	200kA	DCA001203	12A, 5mH	RLW-001101	11A, 1mH	RLW-001403	14A, 1.6mH	MT-32/3D11	9.0-13.0A	10.6A
5	40	50kA	30	30	J	200kA	DCA001803	18A, 2.75mH	RLW-002101	21A, 0.53mH	RLW-002803	28A, 0.82mH	MT-32/3D19	12.0-18.0A	16.7A
7.5	60	50kA	60	45	J	200kA	DCA003201	32A, 0.85mH	RLW-002801	28A, 0.4mH	RLW-003503	35A, 0.7mH	MT-32/3D27	18.0-26.0A	24.2A
10	80	50kA	60	60	J	200kA	DCA004002	40A, 0.75mH	RLW-003501	35A, 0.4mH	RLW-004603	28A, 0.4mH	MT-32/3D34	24.0-34.0A	30.8
15	100	50kA	100	90	J	200kA	DCA006201	62A, 0.32mH	RLW-005501	55A, 0.27mH	RLW-005603	46A, 0.3mH	MT-63/3D55S	43-65A	46.2A
20	150	50kA	200	110	J	200kA	80RB001	80A, 0.31mH	RLW-008301	83A, 0.17mH	RLW-008303	83A, 0.29mH	MT95/3D65S	54-80A	59.4A
25	175	50kA	200	150	J	200kA	110RB001	110A, 0.25mH	RLW-010401	104A, 0.12mH	RLW-010403	104A, 0.23mH	MT-150/3D74S	65-100A	74.8A
30	225	50kA	200	175	J	200kA	110RB001	110A, 0.25mH	RLW-010401	104A, 0.12mH	RLW-008301	83A, 0.17mH	MT-150/3D93S	85-125A	88A
40	300	50kA	200	200	J	200kA	DCA012502	125A, 0.22mH	RLW-013001	130A, 0.095mH	RLW-010401	104A, 0.12mH	MT-225/3D153S	85-125A	114A
50	400	50kA	400	300	J	200kA	150RB001	150A, 0.15mH	RLW-016001	160A, 0.08mH	RLW-013001	130A, 0.095mH	MT- 225/3D130	100-150A	143A
60	500	50kA	400	300	J	200kA	200RB001	200A, 0.12mH	RLW-020001	200A, 0.06mH	RLW-025003	250A, 0.095mH	MT- 400/3D153	120-180A	169A
75	600	50kA	400	400	J	200kA	240RB001	240A, 0.09mH	RLW-025001	250A, 0.05mH	RLW-020001	200A, 0.06mH	MT- 400/3D200	140-220A	211A
100	700	50kA	600	500	J	200kA	300RB001	300A, 0.08mH	RLW-041401	414A, 0.033mH	RLW-032201	322A, 0.05mH	MT-800/3D350	260-400A	273A
125	1000	50kA	600	601	J	200kA	450RB002	450A, 0.11mH	RLW-041401	414A, 0.033mH	RLW-032201	322A, 0.05mH	MT-800/3D350	260-400A	343A
150	1000	50kA	800	700	J	200kA	450RB001	450A, 0.055mH	RLW-051501	515A, 0.025mH	RLW-041401	414A, 0.033mH	MT-800/3D350	260-400A	396A

Mitsubishi Electric US, Industrial Automation PowerGate Electrical Data (380V – 480V)

System hp	Circuit Breaker		Fused Disconnect				DC Choke (MTE or Equivalent)		3% Reactor (MTE or Equivalent)		5% Reactor (MTE or Equivalent)		Overload (Mitsubishi or Equivalent)	O/L	O/L
	Amps	AIC	Switch Max Amps	Fuse Amps	Fuse Class	AIC								Range	Preset
1	15	25kA	30	6	J	200kA	DCA001203	12A, 5mH	RLW-02P103	2.1A, 11mH	RLW-02P105	2.1A, 18mH	MT-32/3D2.1	1.7-2.5A	2.1A
2	15	25kA	30	6	J	200kA	DCA001203	12A, 5mH	RLW-03P403	3.4A, 6.8mH	RLW-03P405	3.4A, 11mH	MT-32/3D3.3	2.8-4.4A	3.4A
3	15	25kA	30	10	J	200kA	DCA001203	12A, 5mH	RLW-04P803	4.8A, 4.8mH	RLW-04P805	4.8A, 7.7mH	MT-32/3D5	4.0-6.0A	4.8A
5	20	25kA	30	15	J	200kA	DCA001203	12A, 5mH	RLW-07P603	7.6A, 3mH	RLW-07P605	7.6A, 4.8mH	MT-32/3D7.5	5.2-8.0A	7.6A
7.5	30	25kA	30	20	J	200kA	DCA001803	18A, 2.75mH	RLW-001103	11A, 2.1mH	RLW-001105	11A, 3.3mH	MT-32/3D11	9.0-13.0A	11A
10	35	25kA	30	25	J	200kA	DCA001803	18A, 2.75mH	RLW-001403	14A, 1.6mH	RLW-001405	14A, 2.6mH	MT-32/3D15	12.0-18.0A	14A
15	60	25kA	60	40	J	200kA	DCA002503	25A, 1.275mH	RLW-002103	21A, 1.1mH	RLW-002105	21A, 1.8mH	MT-32/3D21.5	18.0-26.0A	21A
20	70	25kA	60	50	J	200kA	DCA003202	32A, 1.62mH	RLW-002803	28A, 0.8mH	RLW-002805	28A, 1.3mH	MT-32/3D27	24.0-34.0A	27A
25	90	25kA	60	60	J	200kA	DCA004003	40A, 1mH	RLW-003503	35A, 0.7mH	RLW-003505	35A, 1.2mH	MT-32/3D34	24-34A	34A
30	100	25kA	100	70	J	200kA	50RB002	50A, 0.97mH	RLW-004603	46A, 0.6mH	RLW-004605	46A, 1mH	MT-63/3D42S	34-50A	40A
40	150	25kA	100	100	J	200kA	62RB004	62A, 1.2mH	RLW-006503	65A, 0.4mH	RLW-005505	55A, 0.8mH	MT-63/3D55S	43-65A	52A
50	175	25kA	200	125	J	200kA	DCA008005	80A, 1.25mH	RLW-006503	65A, 0.4mH	RLW-006505	65A, 0.6mH	MT-150/3D74S	54-80A	65A
60	200	25kA	200	150	J	200kA	DCA009202	92A, 0.60mH	RLW-008303	83A, 0.3mH	RLW-008305	83A, 0.5mH	MT-225/3D107	65-100A	77A
75	250	25kA	200	175	J	200kA	125RB003	125A, 0.50mH	RLW-010403	104A,0.2mH	RLW-010405	104A, 0.4mH	MT-225/3D153	85-125A	96A
100	350	25kA	400	225	J	200kA	125RB003	125A, 0.50mH	RLW-013003	130A, 0.2mH	RLW-013005	130A, 0.3mH	MT-225/3D130	85-125A	124A
125	400	25kA	400	300	J	200kA	200RB003	200A, 0.4mH	RLW-016003	160A, 0.155mH	RLW-016005	160A, 0.26mH	MT-225/3D130	120-180A	156A
150	450	25kA	400	350	J	200kA	200RB003	200A, 0.4mH	RLW-020003	200A, 0.1mH	RLW-020005	200A, 0.2mH	MT-400/3D200	120-180A	180A
200	600	25kA	600	450	J	200kA	240RB002	240A, 0.25mH	RLW-025003	250A, 0.095mH	RLW-025005	250A, 0.16mH	MT-400/3D200	140-220A	240A
250	800	25kA	600	600	J	200kA	450RB003	450A, 0.14mH	RLW-032203	322A, 0.07mH	RLW-032205	322A, 0.13mH	MT-800/3D350	260-400A	302A

Mitsubishi Electric US, Industrial Automation PowerGate Electrical Data (472V – 660V)

System hp	Circuit Breaker		Fused Disconnect				DC Choke (MTE or Equivalent)		3% Reactor (MTE or Equivalent)		5% Reactor (MTE or Equivalent)		Overload (Mitsubishi or equivalent)	O/L	
	Amps	AIC	Switch Max Amps	Fuse Amps	Fuse Class	AIC								Range	Preset
1	15	14kA	30	3	J	200kA	DCA000204	2A, 50mH	RLW-02P105	2.1A, 18mH	RLW-02P106	2.1A, 22mH	MT-32/3D2.1	1.4-2A	1.7A
2	15	14kA	30	4.5	J	200kA	DCA000404	4A, 25mH	RLW-04P806	4.8A, 10mH	RLW-03P406	3.4A, 14mH	MT-32/3D3.3	2-3A	2.7A
3	15	14kA	30	6	J	200kA	DCA000403	4A, 15mH	RLW-04P805	4.8A, 7.7mH	RLW-04P806	4.8A, 10mH	MT-32/3D5	2.8-4.4A	3.9A
5	20	14kA	30	10	J	200kA	DCA000904	9A, 11.5mH	RLW-07P605	7.6A, 4.8mH	RLW-07P606	7.6A, 6mH	MT-32/3D7.5	5.2-8.0A	6.1A
7.5	25	14kA	30	15	J	200kA	DCA000903	9A, 7.5mH	RLW-001105	11A, 3.3mH	RLW-001106	11A, 4.2mH	MT-32/3D11	7-11A	9.0A
10	30	14kA	30	20	J	200kA	DCA001204	12A, 6mH	RLW-001103	11A, 1.3mH	RLW-001106	11A, 4.2mH	MT-32/3D11	9.0-13.0A	11A
15	45	14kA	60	30	J	200kA	DCA001804	18A, 3.75mH	RLW-002105	21A, 1.8mH	RLW-002106	21A, 2.2mH	MT-32/3D19	12.0-18.0A	17A
20	60	14kA	60	40	J	200kA	DCA002505	25A, 4mH	RLW-002805	28A, 1.3mH	RLW-002806	28A, 1.6mH	MT-32/3D21.5	18.0-26.0A	22A
25	70	14kA	60	50	J	200kA	DCA003203	32A, 2.68mH	RLW-002803	28A, 0.82mH	RLW-002806	28A, 1.6mH	MT-32/3D27	24.0-34.0A	27A
30	80	14kA	60	50	J	200kA	DCA003203	32A, 2.68mH	RLW-003503	35A, 0.71mH	RLW-003505	35A, 1.2mH	MT-32/3D34	24-34A	32A
40	100	14kA	100	60	J	200kA	DCA005003	50A, 1.35mH	RLW-004603	46A, 0.55mH	RLW-004605	46A, 0.98mH	MT-63/3D42S	34-50A	41A
50	150	14kA	100	70	J	200kA	DCA62RB004	62A, 1.2mH	RLW-005503	55A, 0.48mH	RLW-005505	55A, 0.75mH	MT-63/3D55S	54-80A	52A
60	175	14kA	200	80	J	200kA	DCA62RB004	62A, 1.2mH	RLW-006503	65A, 0.38mH	RLW-006505	65A, 0.64mH	MT-95/3D74S	54-80A	62A
75	200	14kA	200	90	J	200kA	80RB004	80A, 0.75mH	RLW-008303	83A, 0.29mH	RLW-008305	83A, 0.51mH	MT-95/3D83S	65-100A	77A
100	250	14kA	200	200	J	200kA	DCA011003	110A, 0.45mH	RLW-010403	104A, 0.23mH	RLW-010405	104A, 0.375mH	MT-225/3D80	65-100A	99A
125	350	14kA	400	225	J	200kA	125RB003	125A, 0.50mH	RLW-013003	130A, 0.18mH	RLW-013005	130A, 0.3mH	MT-225/3D130	100-150A	125A
150	400	14kA	400	300	J	200kA	150RB003	150A, 0.32mH	RLW-016003	160A, 0.155mH	RLW-016005	160A, 0.26mH	MT-225/3D130	120-180A	144A
200	500	14kA	400	350	J	200kA	200RB003	200A, 0.4mH	RLW-020003	200A, 0.115mH	RLW-020005	200A, 0.2mH	MT-400/3D200	140-220A	192A
250	700	14kA	600	450	J	200kA	300RB003	300A, 0.32mH	RLW-025003	250A, 0.095mH	RLW-025005	250A, 0.16mH	MT-800/3D265	260-400A	242A

PowerGate 'E' Series Economical Solution for Pump and Fan Control – NEMA 1

The PowerGate Economy series is a standard bypass solution for commercial pump and fan applications with limited options to fit application needs.

STANDARD FEATURES and OPTIONS

The Mitsubishi Electric US, Industrial Automation PowerGate 'E' variable torque VFD system consists of the following features:

Standard Features:

- 2 contactor bypass allowing for positive disconnect of power to the VFD when in bypass and sequencing of output power based on operator selection
- Selectable standard miniature circuit breaker (230V and 480V up to 10 hp) Molded case circuit breaker above 10 hp, rated at 5kA SCCR
- Selectable standard fused disconnect rated at 100kA SCCR
- 5% impedance AC line reactor
- HOA keypad for parameter entry and operating values display
- VFD with V/Hz control, RS-485 / Modbus® RTU and BACnet® MS/TP communications
- The VFD includes EMC/RFI filter, 3 sets of user adjustable skip frequencies, PID, dual PID and choice of 0-5Vdc, 0-10Vdc or 4-20mA speed reference
- Class 20 equivalent motor overload protection
- Catch a spinning load / windmill start activated
- Class 2 control transformer
- Convenient power entry and exit from bottom of the panel with generous contractor wiring area

Bypass Alpha controller with LCD display of operation status display includes, but not limited to:

- VFD Mode
- Current Date
- System Off
- Run Open
- Bypass Mode
- I/O Screen
- Test Mode
- VFD Fault
- Fireman Mode
- Real-time Clock
- Bypass Type
- Run Closed
- Run Hours
- Bypass Fault
- Forced Run
- Bypass Hours
- Version Control

Options:

- Damper Vane Actuator Relay
- Extended analog output
- Communication networks: Lonworks®, Metasys® N2, Siemens FLN, Ethernet IP™, Modbus® TCP/IP, Bacnet® IP, and Profinet®

Part Number Structure

E □□ □ □ □ □ □ □

Symbol	Horsepower Rating
001 – 025	1 – 25 HP* NEMA

*Maximum HP varies according to voltage and enclosure type.

Symbol	Input Voltage
2	208 – 240V
4	380 – 480V
6	472 – 660V*

*600V not available in initial release of PowerGate E. Planned second phase.

Symbol	Disconnect Type
C	UL 489 circuit breaker (5kA SCCR)
F	Fused disconnect (100kA SCCR)

Symbol	Enclosure Type
1	NEMA 1

Symbol	Network Type
R	Enhanced RS-485 capability Siemens FLN, Metasys N2 (Modbus RTU and BACnet, MS/TP are standard)
L	LonWorks
E	Ethernet communications (Ethernet/IP, Modbus TCP/IP, BACnet IP, PROFINET)

Select one option if required, otherwise leave blank

Symbol	Bypass Type
S	Standard bypass

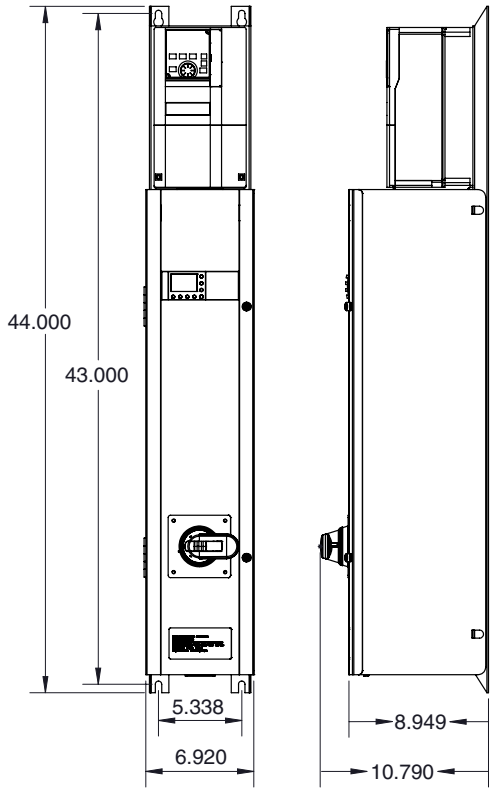
Symbol	Reactor Type
5	5% input reactor

Symbol	Options
A	Damper vane actuator relay fitted
C	Extended analog output

Standard Product with Fused Disconnect & 2 Contactor Standard Bypass VFD System		208V–240V Based VFD System		Panel Size	460V Based VFD System		Panel Size
hp	KW	Model Number	Amps		Model Number	Amps	
1	1	**E1F2001S**	4.6	A	**E1F4001S**	2.1	A
2	1.5	**E1F2002S**	7.5		**E1F4002S**	3.4	
3	2.2	**E1F2003S**	10.6		**E1F4003S**	4.8	
5	3.7	**E1F2005S**	16.7		**E1F4005S**	7.6	
7.5	5.5	**E1F2007S**	24.2	B	**E1F4007S**	11	
10	7.5	**E1F2010S**	30.8		**E1F4010S**	14	B
15	11	**E1F2015S**	46.2		**E1F4015S**	21	
20	15	**E1F2020S**	59.4		**E1F4020S**	27	
25	20	N/A	N/A		**E1F4025S**	34	

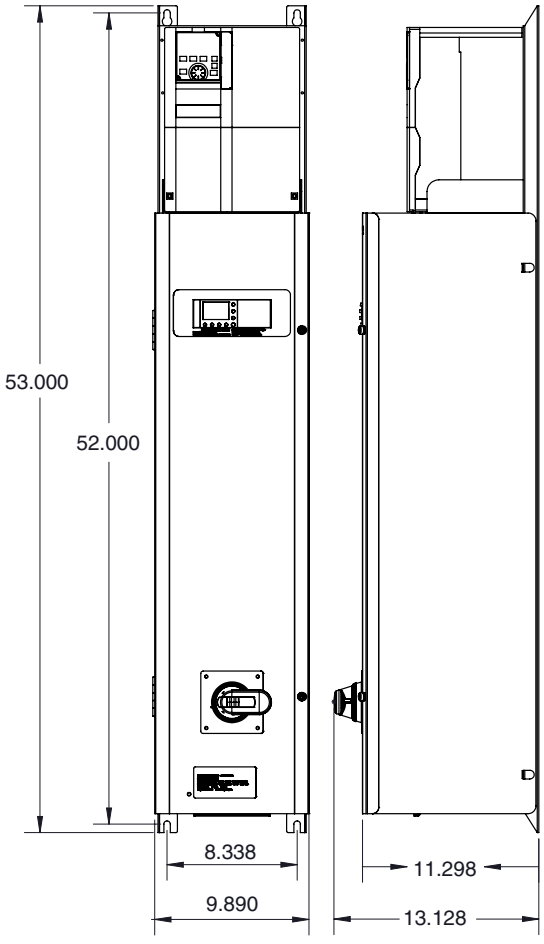
Standard Product with Fused Disconnect & 2 Contactor Standard Bypass VFD System		208V–240V Based VFD System		Panel Size	460V Based VFD System		Panel Size
hp	KW	Model Number	Amps		Model Number	Amps	
1	1	**E1C2001S**	4.6	A	**E1C4001S**	2.1	A
2	1.5	**E1C2002S**	7.5		**E1C4002S**	3.4	
3	2.2	**E1C2003S**	10.6		**E1C4003S**	4.8	
5	3.7	**E1C2005S**	16.7		**E1C4005S**	7.6	
7.5	5.5	**E1C2007S**	24.2	B	**E1C4007S**	11	
10	7.5	**E1C2010S**	30.8		**E1C4010S**	14	B
15	11	**E1C2015S**	46.2		**E1C4015S**	21	
20	15	**E1C2020S**	59.4		**E1C4020S**	27	
25	20	N/A	N/A		**E1C4025S**	34	

System Dimensions
240V: 1, 2, 3, & 5 HP
480V: 1, 2, 3, 5, & 7.5 HP



Panel A

System Dimensions
240V: 7.5, 10, 15, & 20 HP
480V: 10, 15, 20, & 25 HP



Panel B

PowerGate 'E' Electrical Data

Mitsubishi Electric US, Industrial Automation PowerGate Electrical Data (208V – 240V)

Controller Type					Type E1Cxxx(S)5		Type E1xxxxx(5)	Type E1xxxxx(5)
Voltage	hp	Metal Frame Size	CKT Breaker Size (A)	Fuse Size (A)	L503 Line Reactor (5%) Model Number	T511 Control XFMR Size (VA)	M608A/M606 Reversing Contactors P/N	OL503 Overload Relay Model Number
208V	1	A	8	2	RLW-07P603	75	S-T21AC24V2A2B	TH-T25KP5A
208V	2		13	12	RLW-001103	75	S-T21AC24V2A2B	TH-T25KP6.6A
208V	3		16	17.5	RLW-001403	75	S-T21AC24V2A2B	TH-T25KP11A
208V	5		25	25	RLW-002803	75	S-T21AC24V2A2B	TH-T25KP15A
208V	7.5	B	40	40	RLW-003503	96	S-T50AC24V2A2B	TH-T50KP22A
208V	10		60	70	RLW-004603	96	S-T50AC24V2A2B	TH-T50KP29A
208V	15		80	70	RLW-006503	96	S-T50AC24V2A2B	TH-T50KP35A
208V	20		100	80	RLW-008303	96	S-T65AC24V2A2B	TH-T65KP54A

Mitsubishi Electric US, Industrial Automation PowerGate Electrical Data (460V)

Controller Type					Type E1Cxxx(S)5		Type E1xxxxx(5)	Type E1xxxxx(5)
Voltage	hp	Metal Frame Size	CKT Breaker Size (A)	Fuse Size (A)	L503 Line Reactor (5%) Model Number	T511 Control XFMR Size (VA)	M608A/M606 Reversing Contactors Model Number	OL503 Overload Relay Model Number
460V	1	A	4	3.5	RLW-02P105	75	S-T21AC24V2A2B	TH-T25KP2.1A
460V	2		8	5	RLW-03P405	75	S-T21AC24V2A2B	TH-T25KP3.6A
460V	3		10	6	RLW-04P805	75	S-T21AC24V2A2B	TH-T25KP5A
460V	5		15	12	RLW-07P605	75	S-T21AC24V2A2B	TH-T25KP6.6A
460V	7.5		20	17.5	RLW-001105	75	S-T21AC24V2A2B	TH-T25KP11A
460V	10	B	30	20	RLW-001405	96	S-T21AC24V2A2B	TH-T25KP15A
460V	15		40	40	RLW-002105	96	S-T50AC24V2A2B	TH-T50KP29A
460V	20		50	40	RLW-002805	96	S-T50AC24V2A2B	TH-T50KP29A
460V	25		60	70	RLW-003505	96	S-T50AC24V2A2B	TH-50KP42A