

# Submittal Summary



## Fuji Electric Corp. of America (FECO) Variable Frequency Drives – HVAC Systems

### Submittal Summary Data Form – NEMA 12 Ventilated Bypass Systems

Project: \_\_\_\_\_

Architect: \_\_\_\_\_ Engineer: \_\_\_\_\_

Contractor: \_\_\_\_\_

Submitted By: \_\_\_\_\_ Date: \_\_\_\_\_

Tag #	Model #	Unit Ratings (Voltage, HP, Rated Current)

**Standard Features**

- NEMA 12 ventilated enclosure
- Metallic enclosures to reduce radio frequency interference (RFI)
- Integral main disconnect with branch circuit protection, including a padlockable through-the-door operator handle mechanically interlocked with the enclosure door
- 3% AC line reactor provided as standard below 100HP to minimize harmonics and provide transient voltage protection for the drive, with the option of a 5% AC line reactor. At 100HP and above, a DC link reactor is provided, with the option for adding a 3% or 5% AC line reactor
- Control power transformer with primary & secondary fusing
- Door mounted drive keypad with backlit LCD and LED displays for drive set-up, troubleshooting, local operation control, maintenance indication, and operational indication
- 0-10Vdc or 4-20mA customer supplied analog input for remote speed reference
- 0-10Vdc or 4-20mA analog output for indication (programmable)
- Safety Interlock, Run, Enable, and Fireman Override Inputs
- Damper Control Output Contacts
- Drive Run and Fault Status Outputs
- Built-in communications, user selectable between Modbus RTU, Metasys<sup>®</sup> N2, or APOGEE<sup>®</sup> FLN (P1), with additional communication drive options including; LonWorks<sup>®</sup>, BACnet, DeviceNet, Profibus DP and EtherNet
- Mechanically & electrically interlocked drive output and bypass contactors
- Class 20 overload relay for motor thermal protection in bypass mode
- Drive isolation contactor included in 3 Contactor Bypass configuration
- Control terminal strip for easy input and output control wiring
- Door mounted operator controls and indication for “Power On”, “Bypass Run” and “Motor Overload” (during bypass mode)
- Bypass Run Status Output
- UL/cUL Listed

# Bypass General Specifications

## Environmental

Enclosure	NEMA 12 Ventilated (UL Type 1)
Ambient Temperature	+14 to +104° F (-10 to +40° C)
Storage Temperature	+5 to +140° F (-15 to +60° C)
Humidity	5% to 95% with no condensation
Altitude	0 to 3,300 ft. (1,000 m) without derating, derate output current by 1% for each additional 330 ft (100m)

## Codes and Standards

UL, cUL Listed per UL508A
Conforms to applicable NEMA ICS, NFPA, & IEC standards

## Electrical

Input Voltage; Nominal - Phase	208VAC, 230VAC, 460VAC - 3 Phase
Input Voltage; Tolerance, Unbalance	+/-10%, <3%
Input Frequency	60Hz +/-5%
Displacement Power Factor	≥0.97
Output Voltage; Range - Phase	0 to maximum input voltage - 3 Phase
Output Frequency	0.1 to 120Hz
Motor Control Method	PWM drive output with V/F control, includes programmable "catch-a-spinning motor" function
PWM Switch Frequency	0.75 to 15kHz (2 to 25Hp for 208/230V and 2 to 30Hp for 460V) 0.75 to 10kHz (30 to 60Hp for 208/230V and 40 to 100Hp for 460V) 0.75 to 6kHz (125 to 200Hp for 460V)
Drive Overload Capacity	120% rated current for 1 min.
Motor Overload	Class 20 Protection (electromechanical/electronic)
Torque Boost	Programmable to provide additional starting torque if required
Speed Reference	0 to +10VDC, 4 to 20mA, or Keypad (programmable inverse operation for analog signals)
Speed Reference Resolution	Analog setting: 1/1000 of maximum frequency Keypad setting: 0.01Hz (99.99Hz or less)
Acceleration/Deceleration Time	0 to 3600 seconds, with four user selectable patterns
Jump Frequencies	Qty 3 programmable frequency set points with adjustable jump bandwidth of 0 to 30Hz
Output Signals	Qty 4: N.O. dry contacts rated 5A @ 230V max, functionality: Drive Run, Drive Fault, Bypass Run, & Damper Control Qty 1: 0 to 10VDC or 4 to 20mA, user selectable programmable analog signal

**Drawing Number Selection Matrix**  
**NEMA 12 Ventilated Bypass**

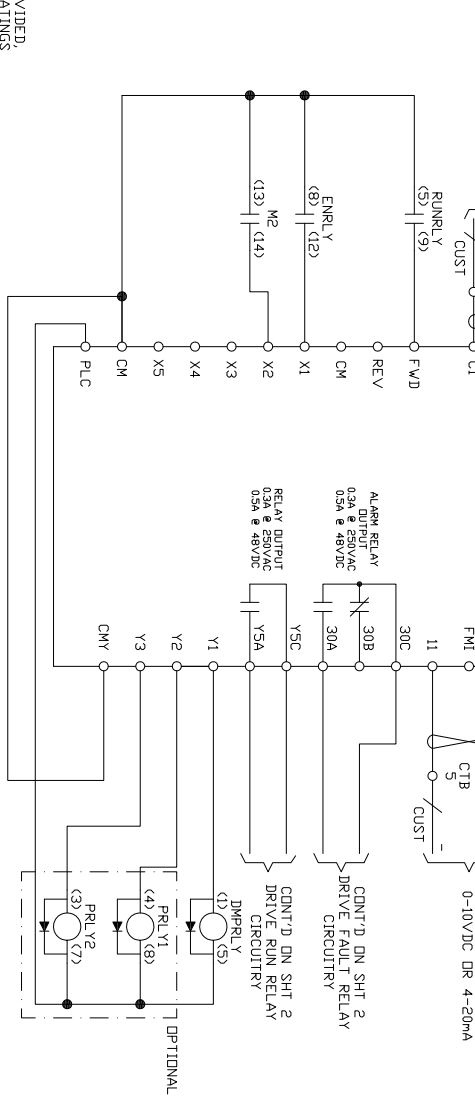
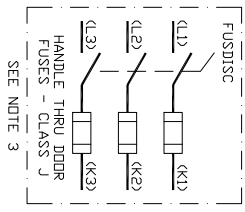
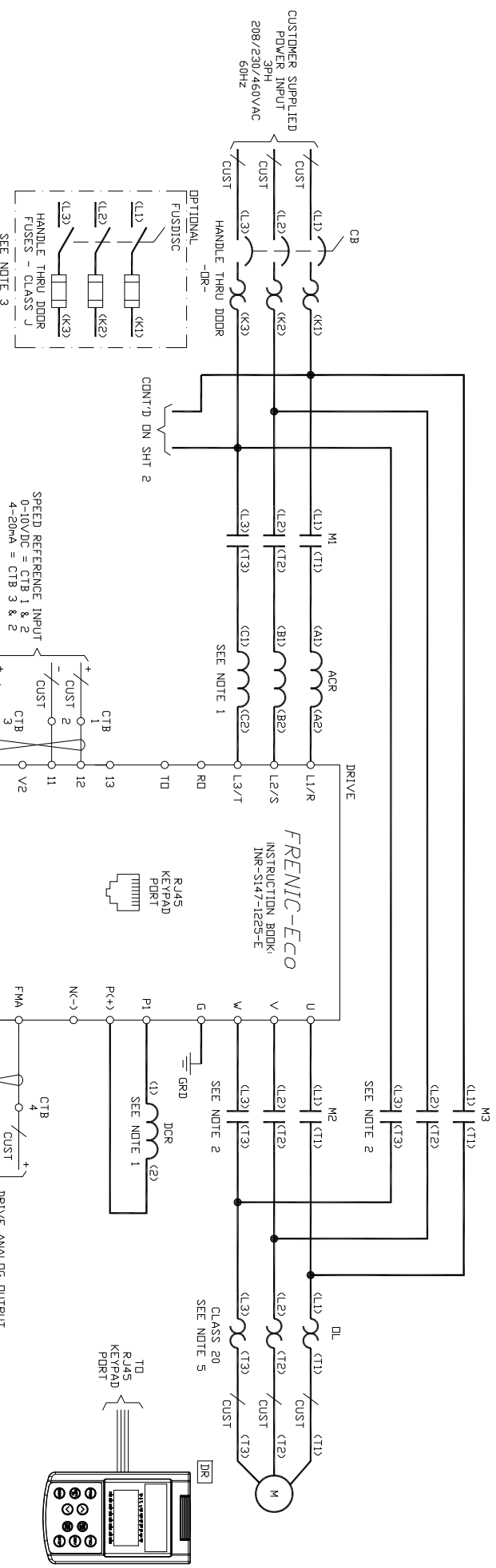
**208/230V**

HP	Current (A)	Electrical Drawing	Outline Drawing
2	7.5	ROA700011	ROA700037
3	10.6	ROA700011	ROA700037
5	16.7	ROA700011	ROA700037
7.5	25	ROA700011	ROA700038
10	31	ROA700011	ROA700038
15	47	ROA700011	ROA700038
20	60	ROA700011	ROA700039
25	75	ROA700011	ROA700039
30	88	ROA700011	ROA700040
40	114	ROA700011	ROA700045
50	143	ROA700011	ROA700045
60	169	ROA700011	ROA700022

**460V**

HP	Current (A)	Electrical Drawing	Outline Drawing
2	3.7	ROA700011	ROA700037
3	5	ROA700011	ROA700037
5	8.5	ROA700011	ROA700037
7.5	11	ROA700011	ROA700037
10	14	ROA700011	ROA700038
15	23	ROA700011	ROA700038
20	28	ROA700011	ROA700038
25	34	ROA700011	ROA700039
30	40	ROA700011	ROA700039
40	54	ROA700011	ROA700039
50	65	ROA700011	ROA700040
60	80	ROA700011	ROA700040
75	105	ROA700011	ROA700040
100	130	ROA700011	ROA700045
125	156	ROA700011	ROA700045
150	192	ROA700011	ROA700022
200	240	ROA700011	ROA700022

*Note: The electrical drawing contains two sheets, be sure to include both sheets for submittal.*



**LEGEND**  
 /CUST = CUSTOMER/FIELD WIRING  
 [DR] = DOOR MOUNTED DEVICE

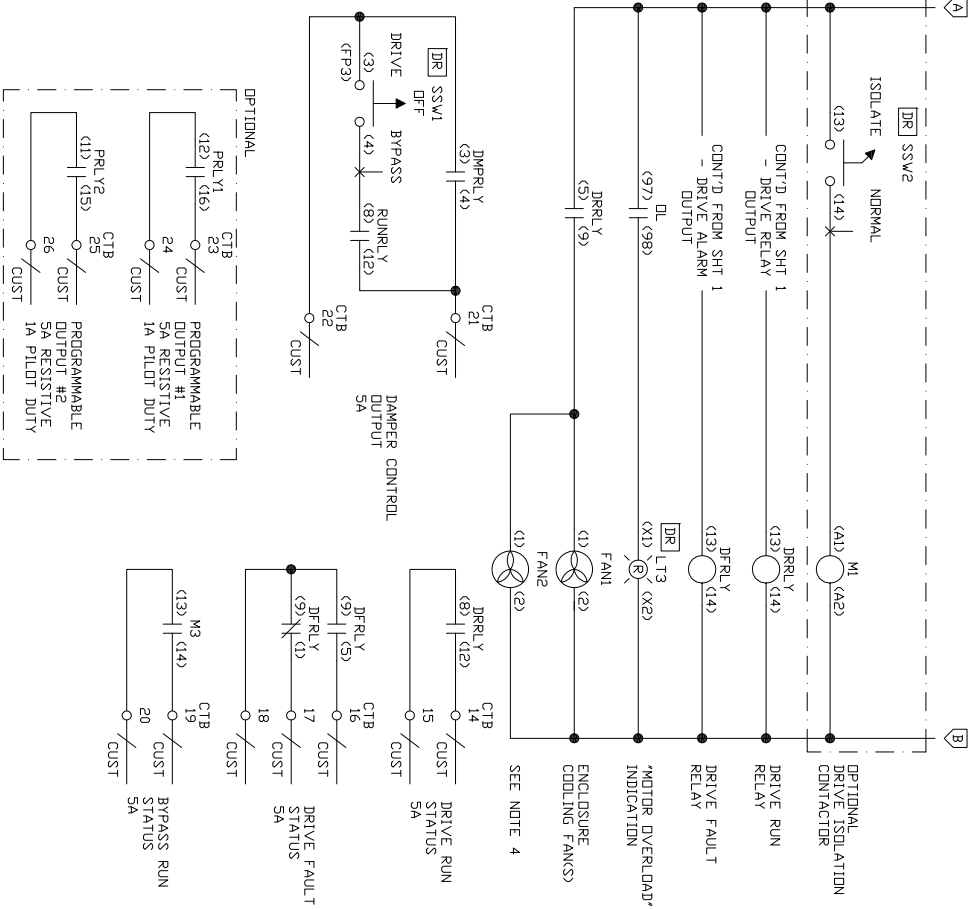
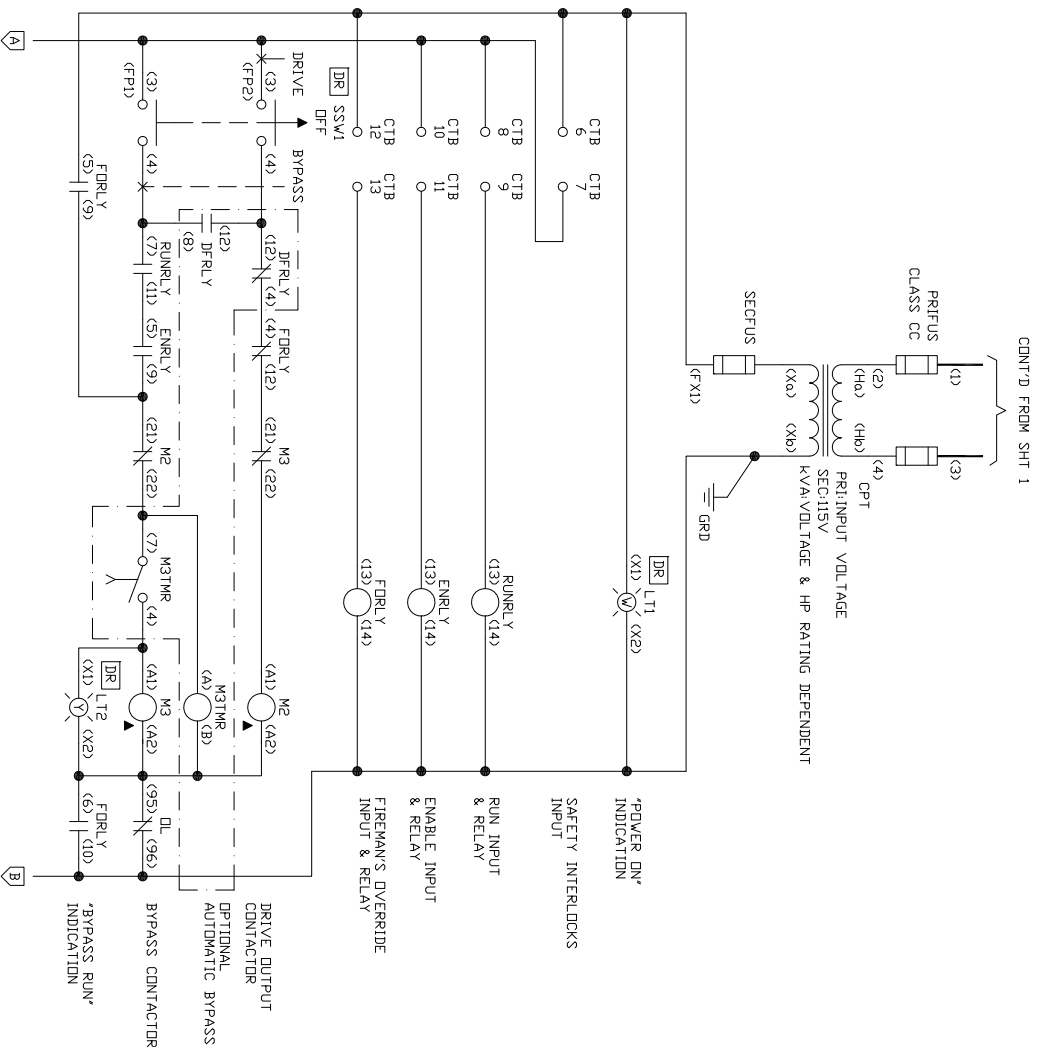
**NOTES:**  
 1) FUSE RATINGS < 75HP, \*ACR\* IS PROVIDED AS STANDARD. \*DCR\* IS NOT PROVIDED, AND A JUMPER IS INSTALLED BETWEEN DRIVE TERMINALS P1 & P(+). FUSE RATINGS ADDITION TO \*DCR\*.  
 2) \*M2\* & \*M3\* ARE ELECTRICALLY AND MECHANICALLY INTERLOCKED.  
 3) FUSIBLE DISCONNECT \*FUSDISC\* IS PROVIDED AS STANDARD FOR RATINGS 2-SHP @ 208/230VAC & 2-10HP @ 460VAC  
 4) \*FAN2\* PROVIDED AS REQUIRED  
 5) \*DL\* LOCATIONS:  
 2-25HP @ 208/230V & 2-60HP @ 460V - LOAD SIDE OF \*M2\* (AS SHOWN)  
 30HP @ 208/230V & 75HP @ 460V - LOAD SIDE OF \*M3\*  
 40-60HP @ 208/230V & 100-200HP @ 460V - LINE SIDE OF \*M3\*  
 MOTOR OVERLOAD PROTECTION PROVIDED BY THE DRIVE WHILE OPERATING IN DRIVE MODE FOR ALL RATINGS.



DESCRIPTION: FRENIC-ECCOPAK, BYPASS (TYPICAL)  
 2 - 60HP @ 208/230VAC  
 2 - 200HP @ 460VAC  
 INSTRUCTION BOOK: FECA-IN-105

DRN. BY: T. WEBB  
 REV. DATE: 05/02/12  
 DATE: 08/25/08  
 REV. BY: B. GAYLE

DWG. NO.: RDA700011  
 SHIT. 1 OF 2



DESCRIPTION: FRENIC-ECOPAK, BYPASS (TYPICAL)

2 - 60HP @ 208/230VAC  
 2 - 200HP @ 460VAC  
 INSTRUCTION BOOK: FECA-IN-105

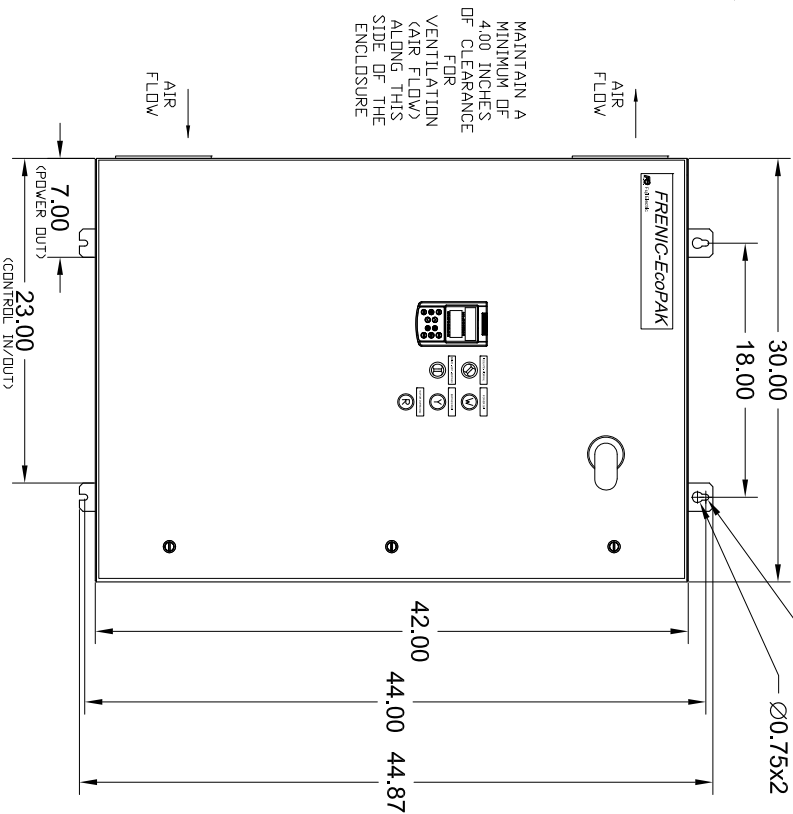
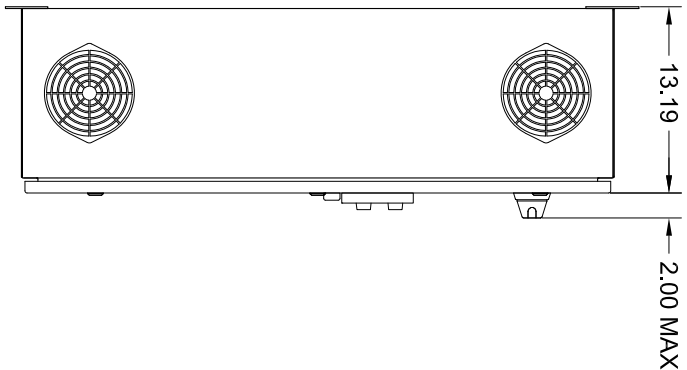
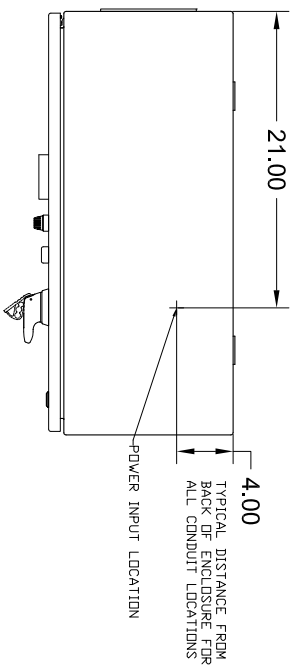
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DWG. NO.: RDA700011  
 SH'T. 2 OF 2

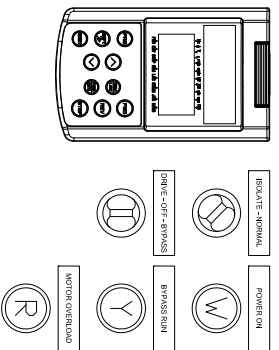
## FRENIC-EcoPAK, NEMA 12 Ventilated Bypass - Electrical Data

Hp Rating	Rated Output Current	Rated Input Current	Circuit Breaker (CB) Amp Rating	Circuit Breaker (CB) AIC Rating	Complete Assembly AIC Rating w/ CB	Fusible Disconnect Amp Rating	Input Fuses Amp Rating	Fusible Disc. w/ Fuses AIC Rating	Complete Assembly AIC Rating w/ Fusible Disc.	DC Reactor		3% AC Line Reactor		5% AC Line Reactor	
										Part Number	Ratings Amps / Inductance	Part Number	Ratings Amps / Inductance	Part Number	Ratings Amps / Inductance
<b>208/230VAC, 60Hz, 3PH</b>															
2	7.5	9.5	See Fusible Disconnect			30	15	200k	100k	See 3% AC Line Reactor	KDRA27L	10A / 1350uH	KDRA26H	10A / 2310uH	
3	10.6	12.6	See Fusible Disconnect			30	20	200k	100k	See 3% AC Line Reactor	KDRA28L	12A / 971uH	KDRA28H	11A / 1570uH	
5	16.7	18.7	See Fusible Disconnect			30	30	200k	100k	See 3% AC Line Reactor	KDRB22L	19A / 626uH	KDRB25H	17A / 1030uH	
7.5	25	27	40	22k	5k	60	45	200k	100k	See 3% AC Line Reactor	KDRB23L	25A / 434uH	KDRB26H	26A / 699uH	
10	31	33	50	22k	5k	60	50	200k	100k	See 3% AC Line Reactor	KDRD25L	34A / 342uH	KDRD21H	31A / 554uH	
15	47	49	80	22k	5k	100	80	200k	100k	See 3% AC Line Reactor	KDRD24L	48A / 220uH	KDRD22H	47A / 375uH	
20	60	62	100	22k	5k	100	100	200k	100k	See 3% AC Line Reactor	KDRD26L	62A / 172uH	KDRC22H	62A / 278uH	
25	75	78	125	25k	5k	200	125	100k	100k	See 3% AC Line Reactor	KDRC22L	80A / 138uH	KDRF28H	75A / 226uH	
30	88	91	150	35k	10k	200	150	100k	100k	See 3% AC Line Reactor	KDRF24L	100A / 116uH	KDRF25H	92A / 189uH	
40	114	117	200	35k	10k	200	200	100k	100k	See 3% AC Line Reactor	KDRF25L	118A / 88.6uH	KDRF26H	114A / 152uH	
50	143	147	250	35k	10k	400	225	200k	100k	See 3% AC Line Reactor	KDRF26L	152A / 69.9uH	KDRH24H	143A / 120uH	
60	169	173	300	35k	18k	400	300	200k	100k	See 3% AC Line Reactor	KDRH22L	180A / 62.4uH	KDRH23H	169A / 103uH	
<b>460VAC, 60Hz, 3PH</b>															
2	3.7	4.7	See Fusible Disconnect			30	8	200k	100k	See 3% AC Line Reactor	KDRA1L	6.4A / 5790uH	KDRA1H	4A / 10300uH	
3	5	6	See Fusible Disconnect			30	10	200k	100k	See 3% AC Line Reactor	KDRA2L	6A / 4270uH	KDRA2H	6A / 7290uH	
5	8.5	9.5	See Fusible Disconnect			30	15	200k	100k	See 3% AC Line Reactor	KDRA3L	9.6A / 2770uH	KDRA3H	8A / 3980uH	
7.5	11	12	See Fusible Disconnect			30	20	200k	100k	See 3% AC Line Reactor	KDRA4L	14A / 1680uH	KDRA4H	12A / 3000uH	
10	14	15	See Fusible Disconnect			30	30	200k	100k	See 3% AC Line Reactor	KDRA5L	14A / 1290uH	KDRA5H	14A / 2232uH	
15	23	24	40	22k	5k	60	40	200k	100k	See 3% AC Line Reactor	KDRB2L	30A / 912uH	KDRB2H	27A / 1690uH	
20	28	29	50	22k	5k	60	50	200k	100k	See 3% AC Line Reactor	KDRB1L	30A / 694uH	KDRC3H	27A / 1210uH	
25	34	35	60	22k	5k	60	60	200k	100k	See 3% AC Line Reactor	KDRD1L	50A / 569uH	KDRC1H	35A / 980uH	
30	40	41	70	22k	5k	100	70	200k	100k	See 3% AC Line Reactor	KDRD2L	45A / 469uH	KDRE2H	45A / 850uH	
40	54	55	90	22k	5k	100	90	200k	100k	See 3% AC Line Reactor	KDRC1L	55A / 387uH	KDRF4H	60A / 581uH	
50	65	68	100	22k	5k	200	110	100k	100k	See 3% AC Line Reactor	KDRF2L	65A / 295uH	KDRF1H	85A / 465uH	
60	80	82	125	25k	5k	200	125	100k	100k	See 3% AC Line Reactor	KDRF4L	77A / 227uH	KDRF2H	77A / 408uH	
75	105	107	200	35k	10k	200	175	100k	100k	See 3% AC Line Reactor	KDRF3L	110A / 196uH	KDRH2H	100A / 315uH	
100	130	132	200	35k	10k	200	200	100k	100k	DCR4-75C	178A / 0.231mH	KDRH3L	150A / 152uH	KDRH2H	125A / 252uH
125	156	158	250	35k	10k	400	250	200k	100k	DCR4-90C	214A / 0.2mH	KDRH2L	165A / 117uH	KDRG3H	160A / 209uH
150	192	194	300	35k	18k	400	300	200k	100k	DCR4-110C	261A / 0.166mH	KDRH1L	185A / 103uH	KDRG1H	185A / 181uH
200	240	242	400	35k	18k	400	400	200k	100k	DCR4-132C	313A / 0.148mH	KDRG3L	240A / 83.9uH	KDRJ1H	240A / 126uH





ENLARGED VIEW OF DOOR DEVICES



NOTES:

1) INSTRUCTION BOOKS: FECA-IN-105 FOR BYPASS & FECA-107 FOR BASIC BYPASS

DIMENSIONS ARE IN INCHES



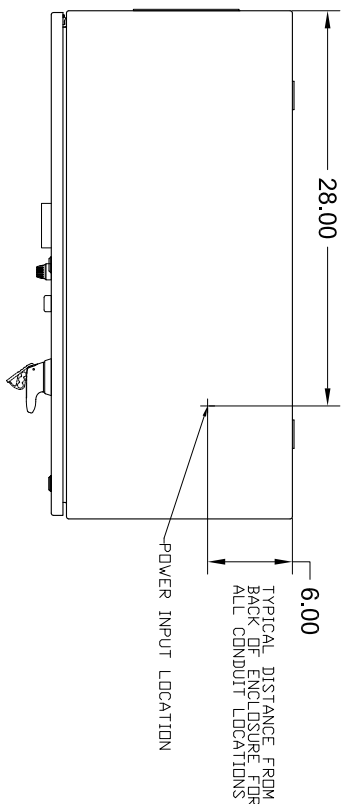
DESCRIPTION: FRENIC-EcoPAK - BYPASS - NEMA 12 VENT.  
7.5-15Hp @ 208/230V  
10-20Hp @ 460V  
INSTRUCTION BOOK: SEE NOTE 1

DRN. BY: R. MONTES  
REV. REV. DATE: REV. BY:  
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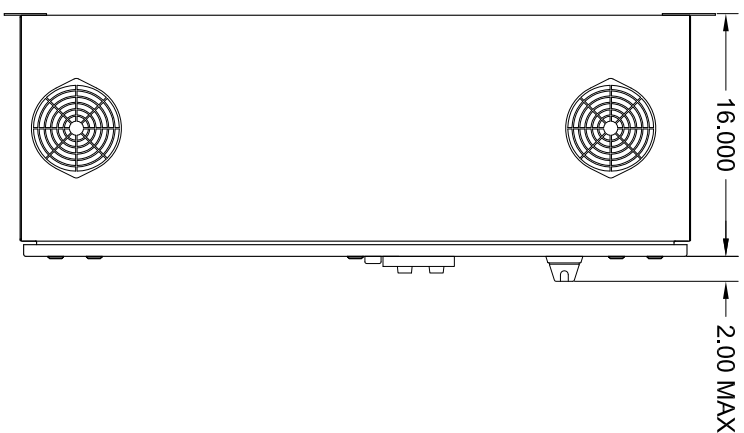
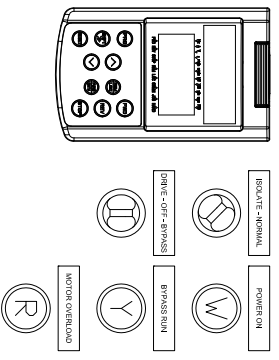
DATE: 12/06/10

DWG. NO: RDA700038  
SHT. 1 OF 1

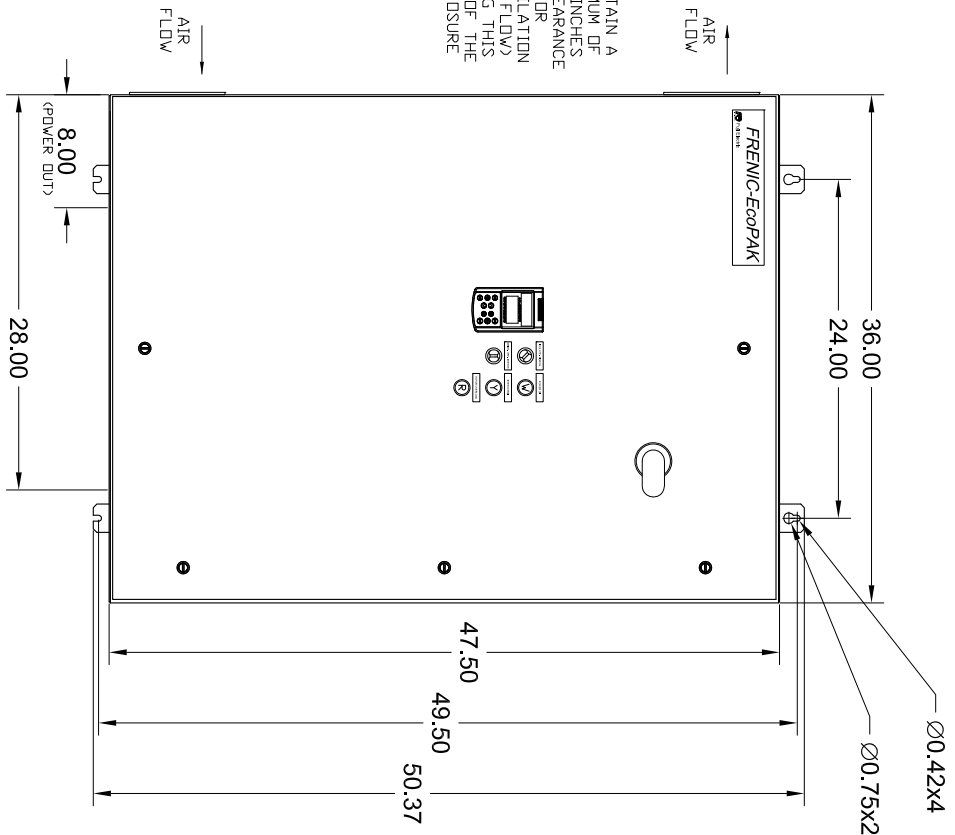




ENLARGED VIEW OF DOOR DEVICES

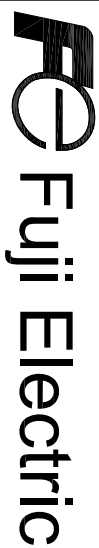


MAINTAIN A MINIMUM OF 4.00 INCHES OF CLEARANCE FOR VENTILATION (AIR FLOW) ALONG THIS SIDE OF THE ENCLOSURE



NOTES:  
 1) INSTRUCTION BOOKS: FECA1N-105 FOR BYPASS & FECA-107 FOR BASIC BYPASS

DIMENSIONS ARE IN INCHES



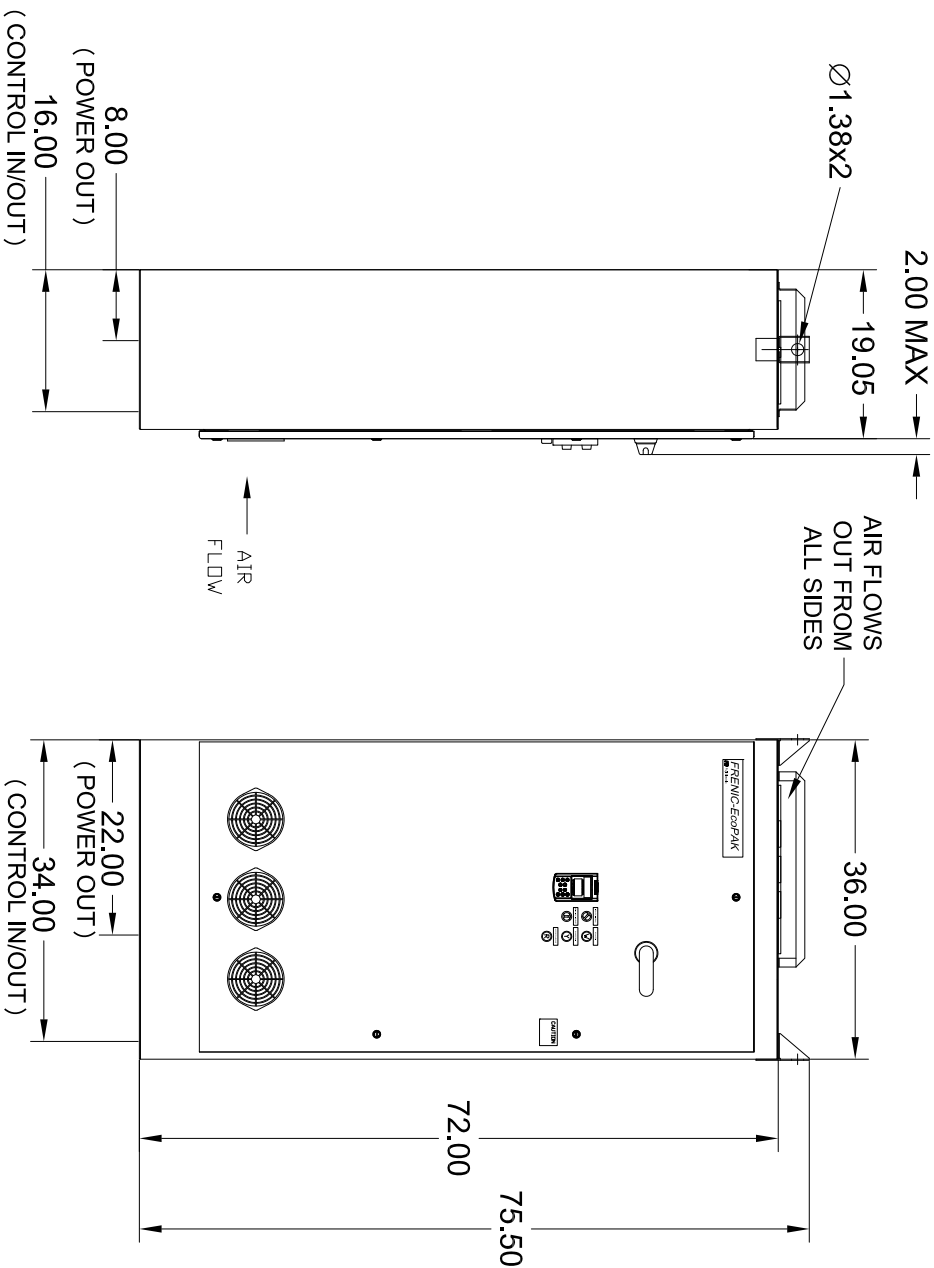
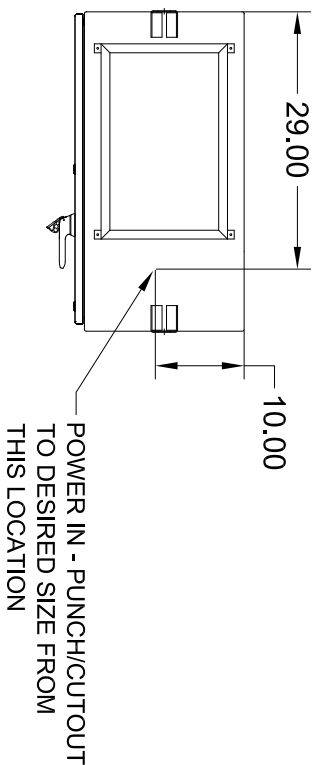
DESCRIPTION: FRENIC-EcoPAK - BYPASS - NEMA 12 VENT.  
 20-25Hp @ 208/230V  
 25-40Hp @ 460V  
 INSTRUCTION BOOK: SEE NOTE 1

DRN. BY: R. MONTES  
 DATE: 10/06/10  
 REV. REV. DATE: REV. BY:

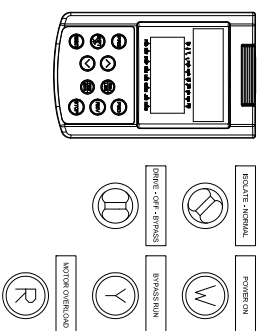
DWG. NO: RDA700039  
 SHT. 1 OF 1



DIMENSIONS PROVIDED FOR ESTIMATING PURPOSES ONLY



ENLARGED VIEW OF  
DOOR DEVICES



1) INSTRUCTION BOOKS: FECA-IN-105 FOR  
BYPASS & FECA-IN-107 FOR BASIC BYPASS

NOTES:

DIMENSIONS ARE IN INCHES

**FE** Fuji Electric

DESCRIPTION: FRENIC-ECOPAK, BYPASS

40-50Hp @ 208/230V 1 100-125Hp @ 460V  
NEMA 1 & NEMA 12 VENTILATED

INSTRUCTION BOOK: SEE NOTE 1

DRN. BY: DATE: 12/09/10

R. MONTES

REV. REV. DATE: REV. BY:

1 12/16/10 T. WEBB

DWG. NO.:

RDA700045

SHT. 1 OF 1



## FRENIC-EcoPAK, Bypass - Mechanical Data

Hp Rating	Overall Dimensions - Height x Width x Depth [inches]	Estimated Max. Weight [lbs]	Estimated Max. Watts Loss
<b><i>208/230VAC, 60Hz, 3PH, NEMA 12 Ventilated</i></b>			
2	38.87 x 24.00 x 15.19	142	229
3	38.87 x 24.00 x 15.19	142	276
5	38.87 x 24.00 x 15.19	147	361
7.5	44.87 x 30.00 x 15.19	156	548
10	44.87 x 30.00 x 15.19	161	660
15	44.87 x 30.00 x 15.19	170	877
20	50.37 x 36.00 x 19.19	278	1145
25	50.37 x 36.00 x 19.19	306	1275
30	62.37 x 36.00 x 19.19	366	1469
40	75.50 x 36.00 x 21.05	644	1934
50	75.50 x 36.00 x 21.05	694	2055
60	93.21 x 48.06 x 27.22	1156	2505
<b><i>460VAC, 60Hz, 3PH, NEMA 12 Ventilated</i></b>			
2	38.87 x 24.00 x 15.19	142	200
3	38.87 x 24.00 x 15.19	142	258
5	38.87 x 24.00 x 15.19	143	397
7.5	38.87 x 24.00 x 15.19	146	427
10	44.87 x 30.00 x 15.19	193	632
15	44.87 x 30.00 x 15.19	196	760
20	44.87 x 30.00 x 15.19	206	918
25	50.37 x 36.00 x 19.19	275	1074
30	50.37 x 36.00 x 19.19	281	1236
40	50.37 x 36.00 x 19.19	294	1297
50	62.37 x 36.00 x 19.19	375	1805
60	62.37 x 36.00 x 19.19	380	2090
75	62.37 x 36.00 x 19.19	439	2143
100	75.50 x 36.00 x 21.05	693	2670
125	75.50 x 36.00 x 21.05	735	2909
150	93.21 x 48.06 x 27.22	1194	3481
200	93.21 x 48.06 x 27.22	1255	4217