Submittal Summary

Fuji Electric
e-Front runners

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

Submittal Summary Data Form – NEMA 1 Bypass Systems

Project: _____

Architect: _____ Engineer: _____

Contractor: _____

Submitted By: _____ Date: _____

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

Standard Features

- **Type 1 enclosure with "Space-saving" footprint**
- **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® N2, or APOGEE® FLN (P1), with additional communication drive options including; LonWorks®, 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**

Information subject to change without notice.

Bypass General Specifications

Environmental

Enclosure	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

UL/NEMA Type 1 Bypass

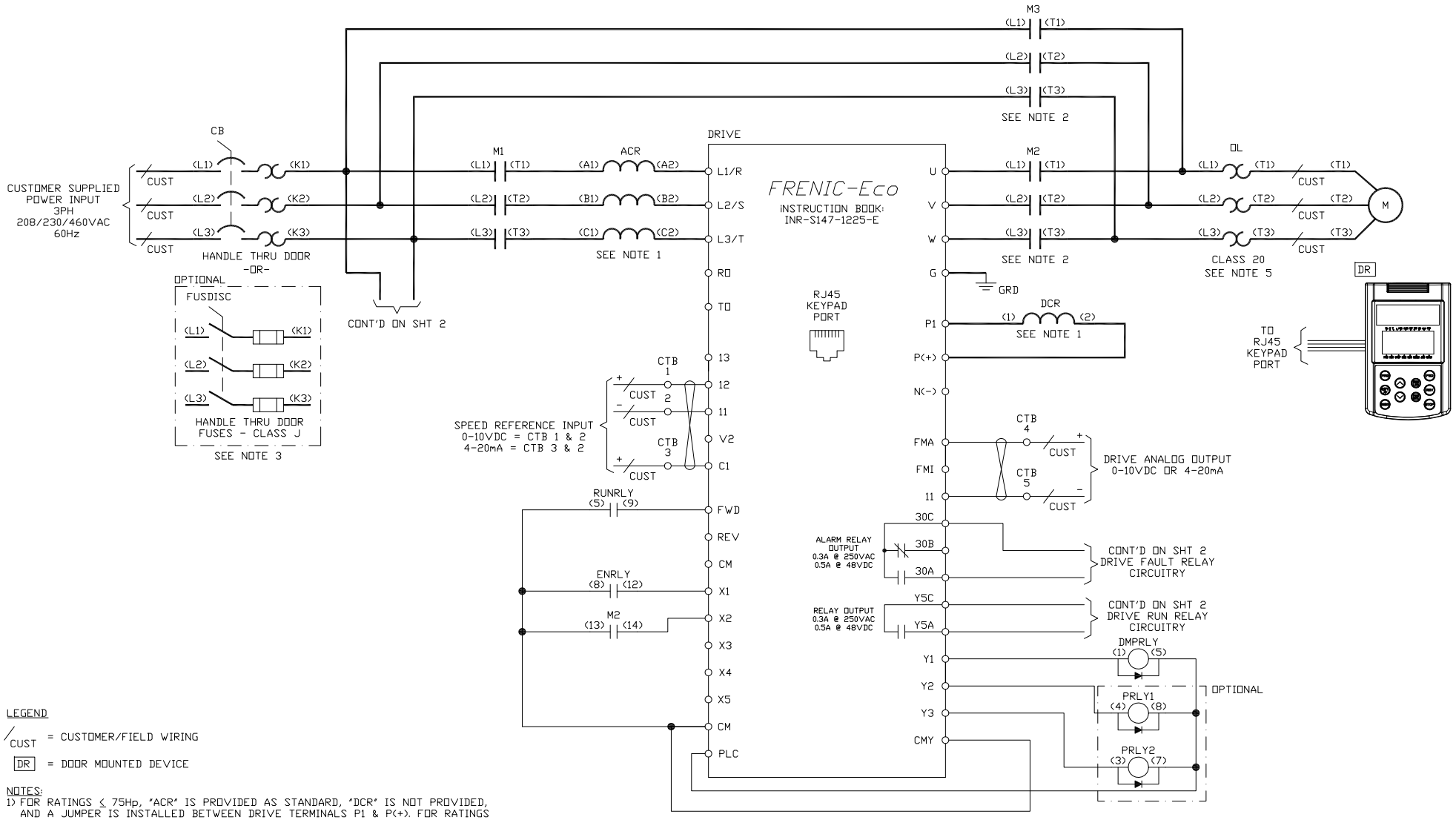
208/230V

HP	Current (A)	Electrical Drawing	Outline Drawing
2	7.5	ROA700011	ROA700003
3	10.6	ROA700011	ROA700003
5	16.7	ROA700011	ROA700003
7.5	25	ROA700011	ROA700003
10	31	ROA700011	ROA700003
15	47	ROA700011	ROA700005
20	60	ROA700011	ROA700005
25	75	ROA700011	ROA700007
30	88	ROA700011	ROA700050
40	114	ROA700011	ROA700045
50	143	ROA700011	ROA700045
60	169	ROA700011	ROA700022

460V

HP	Current (A)	Electrical Drawing	Outline Drawing
2	3.7	ROA700011	ROA700003
3	5	ROA700011	ROA700003
5	7.6	ROA700011	ROA700003
7.5	11	ROA700011	ROA700003
10	14	ROA700011	ROA700003
15	23	ROA700011	ROA700003
20	28	ROA700011	ROA700003
25	34	ROA700011	ROA700005
30	40	ROA700011	ROA700005
40	54	ROA700011	ROA700005
50	65	ROA700011	ROA700007
60	80	ROA700011	ROA700007
75	105	ROA700011	ROA700050
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

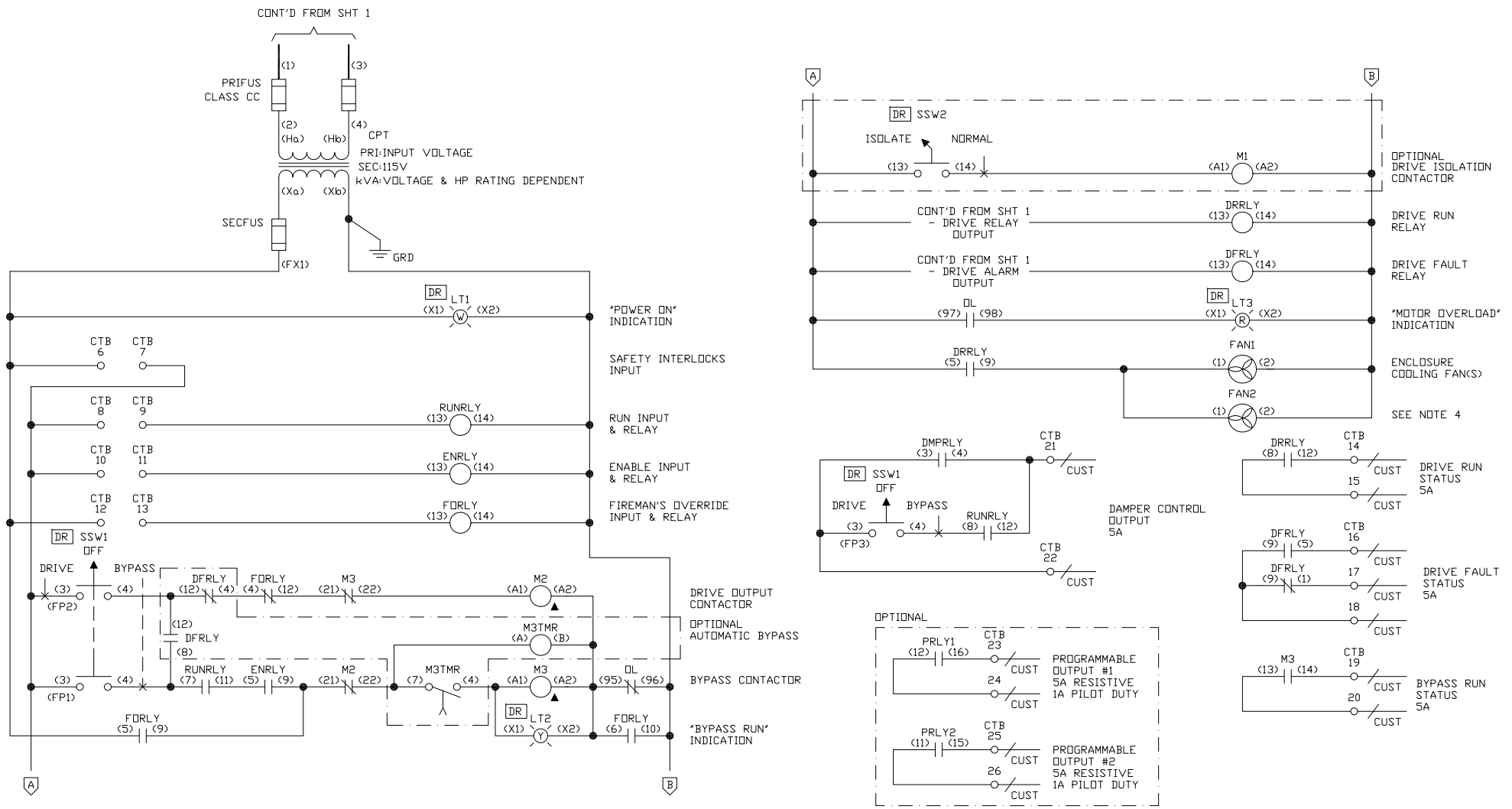
DR = DOOR MOUNTED DEVICE

NOTES:

1) FOR RATINGS ≤ 75Hp, "ACR" IS PROVIDED AS STANDARD, "DCR" IS NOT PROVIDED, AND A JUMPER IS INSTALLED BETWEEN DRIVE TERMINALS P1 & P(+). FOR RATINGS ≥ 100Hp DCR IS ALWAYS PROVIDED, AND "ACR" IS PROVIDED AS AN OPTION IN ADDITION TO "DCR".
2) "M2" & "M3" ARE ELECTRICALLY AND MECHANICALLY INTERLOCKED.
3) FUSIBLE DISCONNECT "FUSDISC" IS PROVIDED AS STANDARD FOR RATINGS 2-5HP @ 208/230VAC & 2-10HP @ 460VAC
4) "FAN2" PROVIDED AS REQUIRED
5) "OL" 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.

Fuji Electric

DESCRIPTION: FRENIC-EcoPAK, BYPASS (TYPICAL) 2 - 60Hp @ 208/230VAC 2 - 200Hp @ 460VAC INSTRUCTION BOOK: FECA-IN-105	DRN. BY: T. WEBB	DATE: 08/25/08	DWG. NO.: ROA700011
	REV.: 1	REV. DATE: 05/02/12	REV. BY: B. GAYLE
			SHT. 1 OF 2



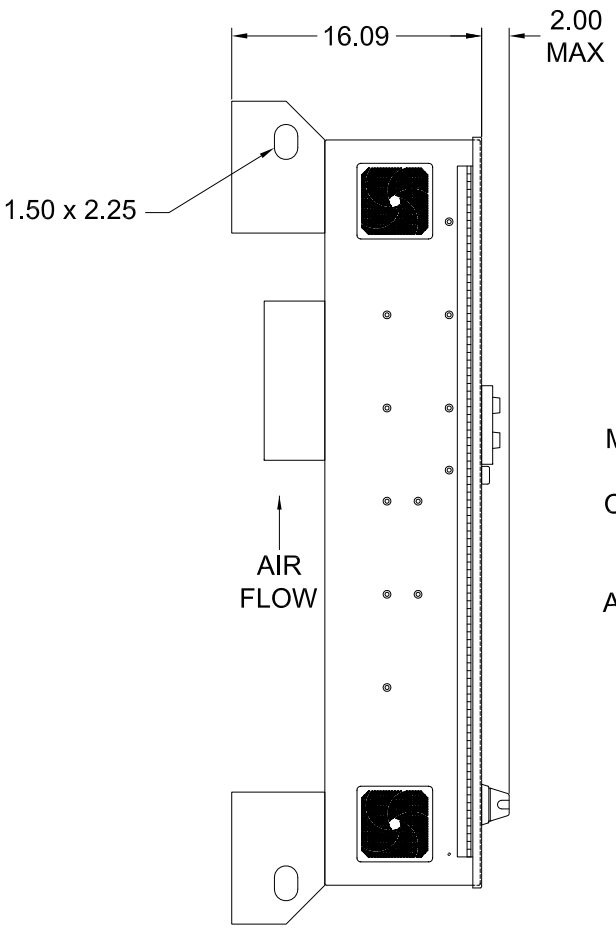
Fuji Electric

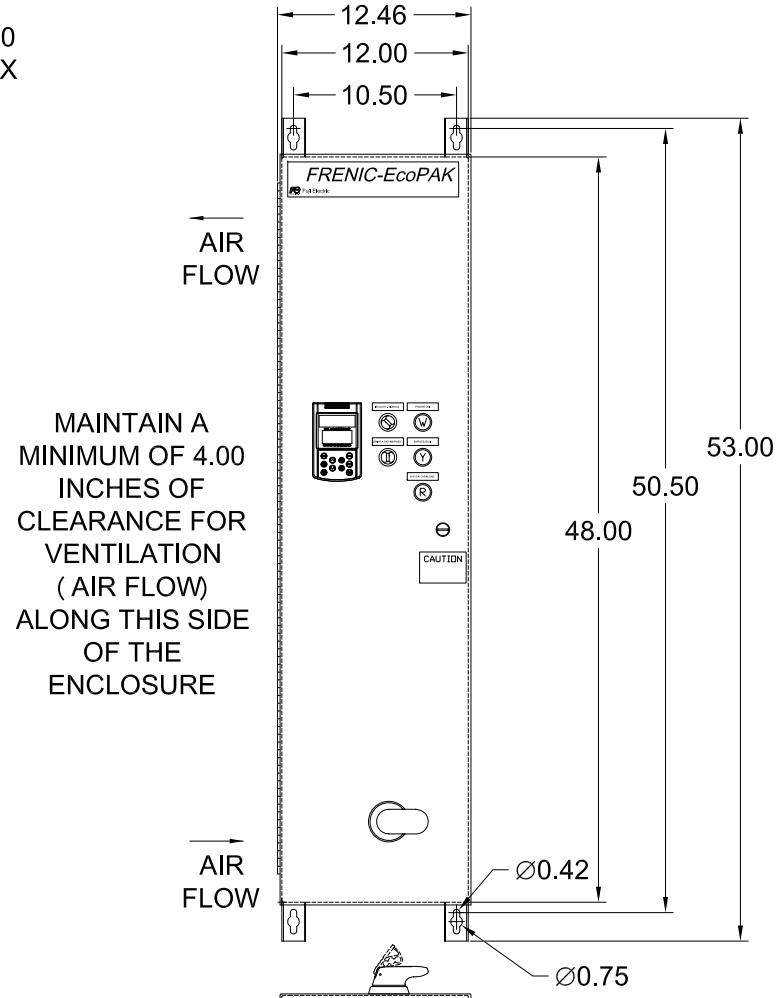
DESCRIPTION: FRENIC-EcoPAK, BYPASS (TYPICAL) 2 - 60Hp @ 208/230VAC 2 - 200Hp @ 460VAC INSTRUCTION BOOK: FECA-IN-105	DRN. BY: T. WEBB	DATE: 08/25/08	DWG. NO.: RDA700011
	REV. 1	REV. DATE: 05/02/12	REV. BY: B. GAYLE
			SHT. 2 OF 2

FRENIC-EcoPAK , UL/NEMA Type 1 Bypass - Electrical Data

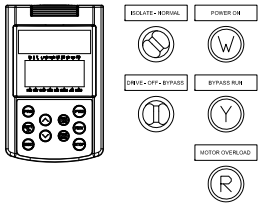
Hp Rating	Rated Output Current	Rated Input Current	Circuit Breaker (CB) Amp Rating	Circuit Breaker (CB) AIC Rating	Complete Assembly AIC Rating w/ CB	Fusible Disconnect Amp Rating	Input Fuses Amp Rating	Fusible Disc. w/ Fuses AIC Rating	Complete Assembly AIC Rating w/ Fusible Disc.	DC Reactor		3% AC Line Reactor		5% AC Line Reactor	
										Part Number	Ratings Amps / Inductance	Part Number	Ratings Amps / Inductance	Part Number	Ratings Amps / Inductance
208/230VAC, 60Hz, 3PH															
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
460VAC, 60Hz, 3PH															
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	7.6	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	KDRI2H	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

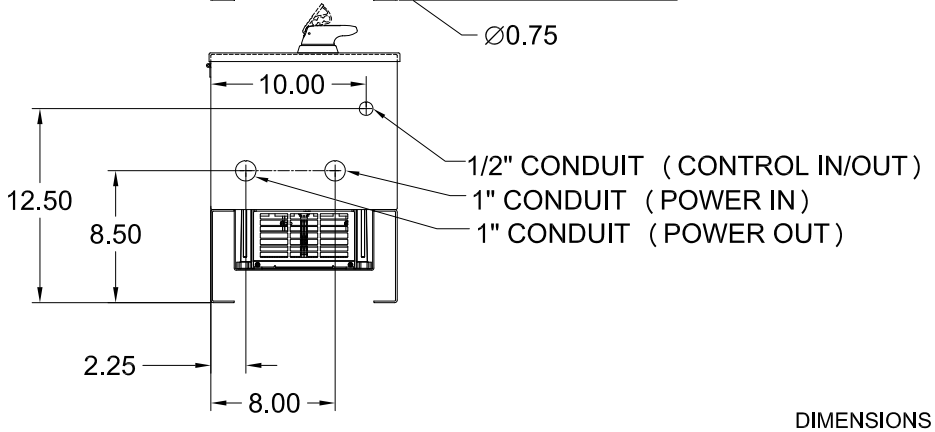
DIMENSIONS PROVIDED FOR ESTIMATING PURPOSES ONLY





ENLARGED VIEW
OF DOOR DEVICES





NOTES:

1) MAINTAIN MIN. 4.00 INCHES CLEARANCE AT TOP OF ENCLOSURE FOR VENTILATION

2) IF LARGER CONDUIT IS REQUIRED PUNCH/CUTOUT TO DESIRED SIZE MAINTAINING SPECIFIED LOCATIONS

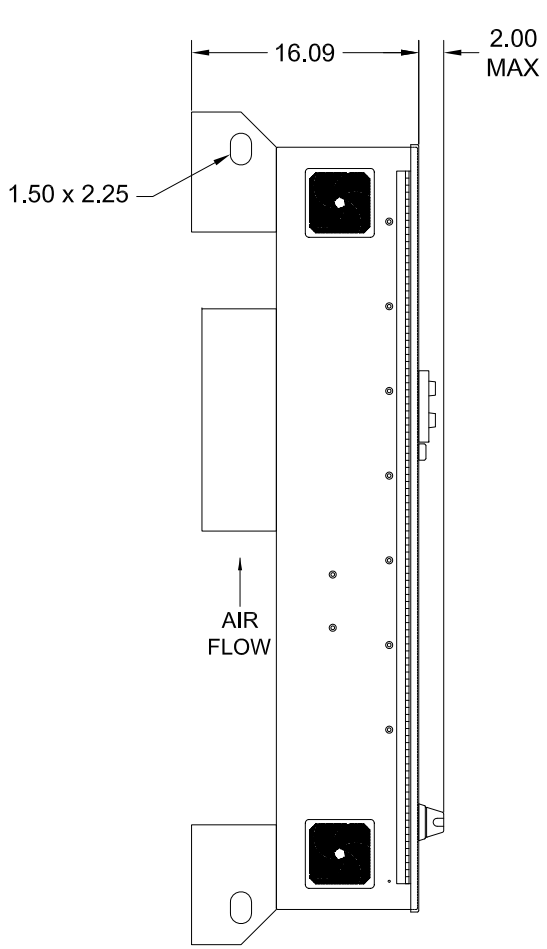
3) INSTRUCTION BOOKS: FECA-IN-105 FOR BYPASS & FECA-IN-107 FOR BASIC BYPASS.

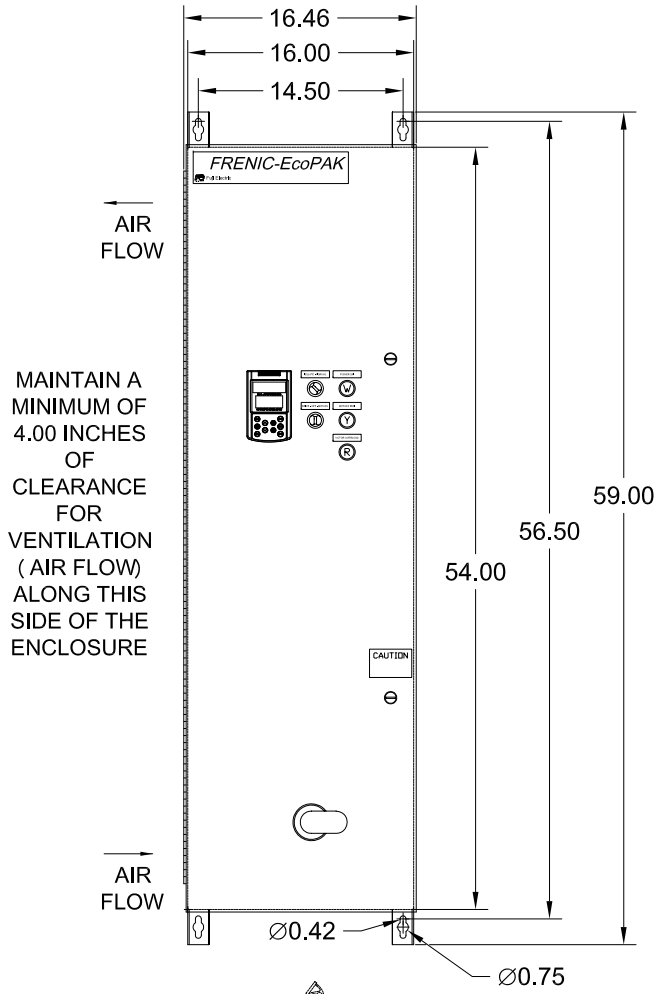
DIMENSIONS ARE IN INCHES

Fuji Electric

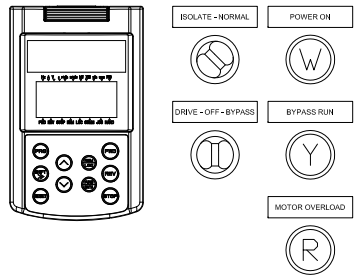
DESCRIPTION: FRENIC-EcoPAK - BYPASS 2-10Hp @ 208/230V I 2-20Hp @ 460V NEMA 1 INSTRUCTION BOOK: SEE NOTE 3	DRN. BY: T. WEBB	DATE: 07/24/08	DWG. NO.: RDA700003
	REV. 1 / REV. DATE: 12/16/10	REV. BY: T. WEBB	SHT. 1 OF 1

DIMENSIONS PROVIDED FOR ESTIMATING PURPOSES ONLY





ENLARGED VIEW
OF DOOR DEVICES



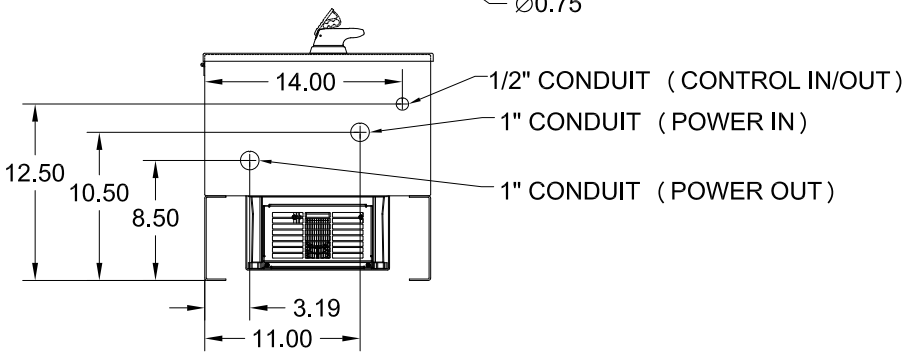
NOTES:

1) MAINTAIN MIN. 4.00 INCHES CLEARANCE AT TOP OF ENCLOSURE FOR VENTILATION

2) IF LARGER CONDUIT IS REQUIRED PUNCH/CUTOUT TO DESIRED SIZE MAINTAINING SPECIFIED LOCATIONS

3) FOR DRIVES RATED 40Hp @ 460V - WHEN AMBIENT TEMPERATURE IS 95°F (35°C) OR HIGHER, LIMIT DRIVE UNIT SWITCHING FREQUENCY TO 6KHz

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

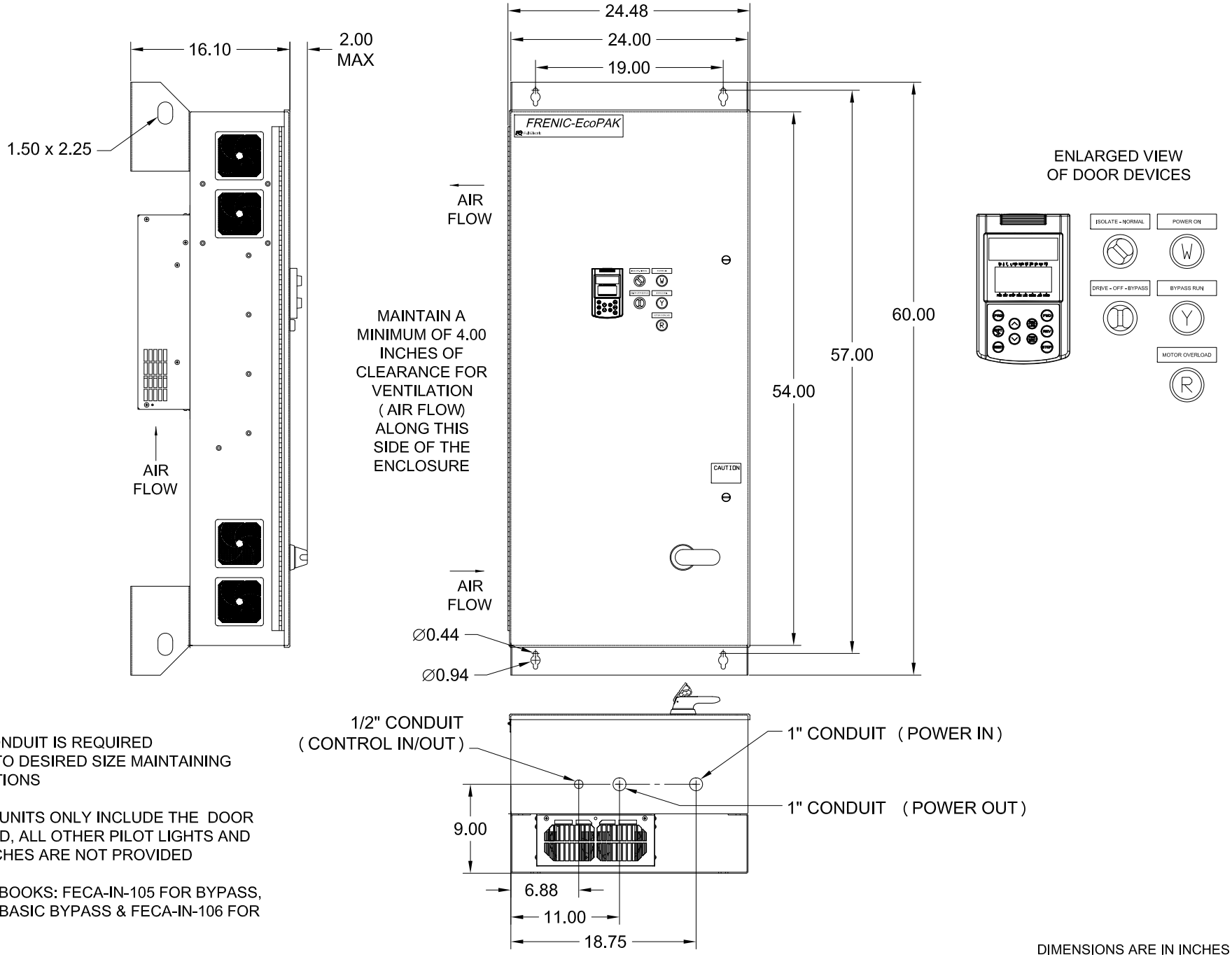


DIMENSIONS ARE IN INCHES

Fuji Electric

DESCRIPTION: FRENIC-EcoPAK - BYPASS 15-20Hp @ 208/230V I 25-40Hp @ 460V NEMA 1 INSTRUCTION BOOK: SEE NOTE 4	DRN. BY: T. WEBB	DATE: 07/28/08	DWG. NO.: ROA700005
	REV. 1	REV. DATE: 12/16/10	REV. BY: T. WEBB
			SHT. 1 OF 1

DIMENSIONS PROVIDED FOR ESTIMATING PURPOSES ONLY



NOTES:

1) IF LARGER CONDUIT IS REQUIRED PUNCH/CUTOUT TO DESIRED SIZE MAINTAINING SPECIFIED LOCATIONS

2) NON-BYPASS UNITS ONLY INCLUDE THE DOOR MOUNTED KEYPAD, ALL OTHER PILOT LIGHTS AND SELECTOR SWITCHES ARE NOT PROVIDED

3) INSTRUCTION BOOKS: FECA-IN-105 FOR BYPASS, FECA-IN-107 FOR BASIC BYPASS & FECA-IN-106 FOR NON-BYPASS

DIMENSIONS ARE IN INCHES

Fuji Electric

DESCRIPTION: FRENIC-EcoPAK - BYPASS & NON-BYPASS 25Hp @ 208/230V I 50-60Hp @ 460V NEMA 1 INSTRUCTION BOOK: SEE NOTE 3	DRN. BY: T. WEBB	DATE: 07/30/08	DWG. NO. : RDA700007
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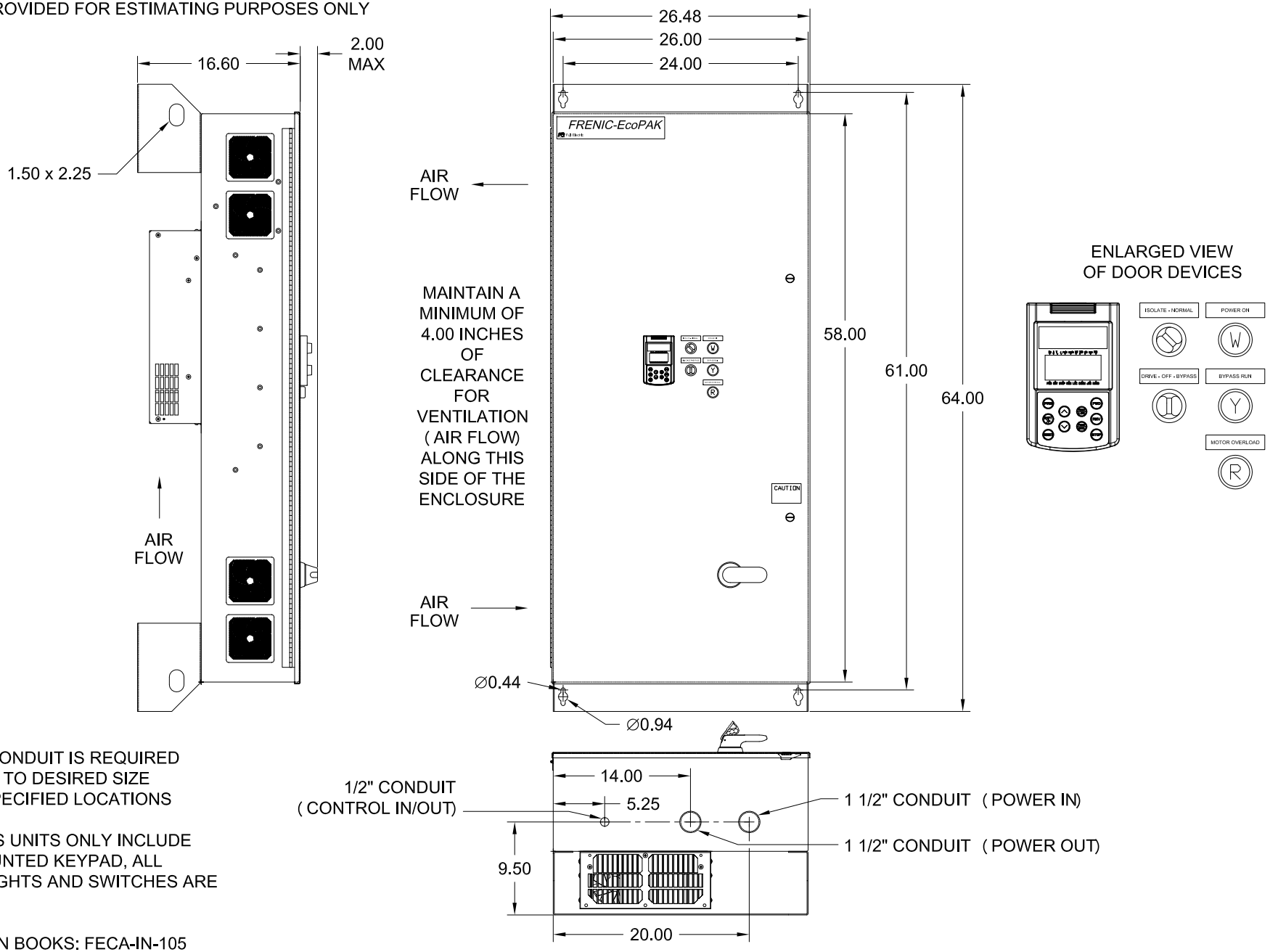
DIMENSIONS PROVIDED FOR ESTIMATING PURPOSES ONLY



NOTES:

1) IF LARGER CONDUIT IS REQUIRED PUNCH/CUTOUT TO DESIRED SIZE MAINTAINING SPECIFIED LOCATIONS

2) NON-BYPASS UNITS ONLY INCLUDE THE DOOR MOUNTED KEYPAD, ALL OTHER PILOT LIGHTS AND SWITCHES ARE NOT PROVIDED.

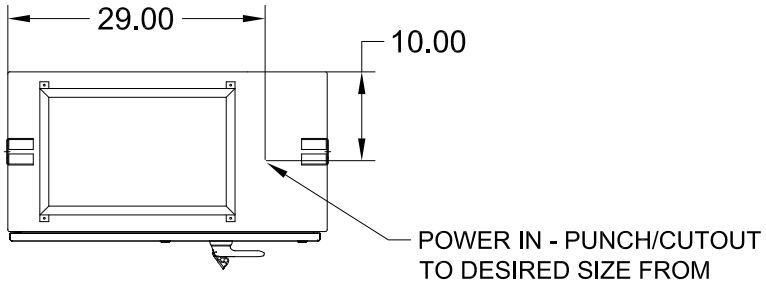
3) INSTRUCTION BOOKS: FECA-IN-105 FOR BYPASS, FECA-IN-107 FOR BASIC BYPASS, & FECA-IN-106 FOR NON-BYPASS.

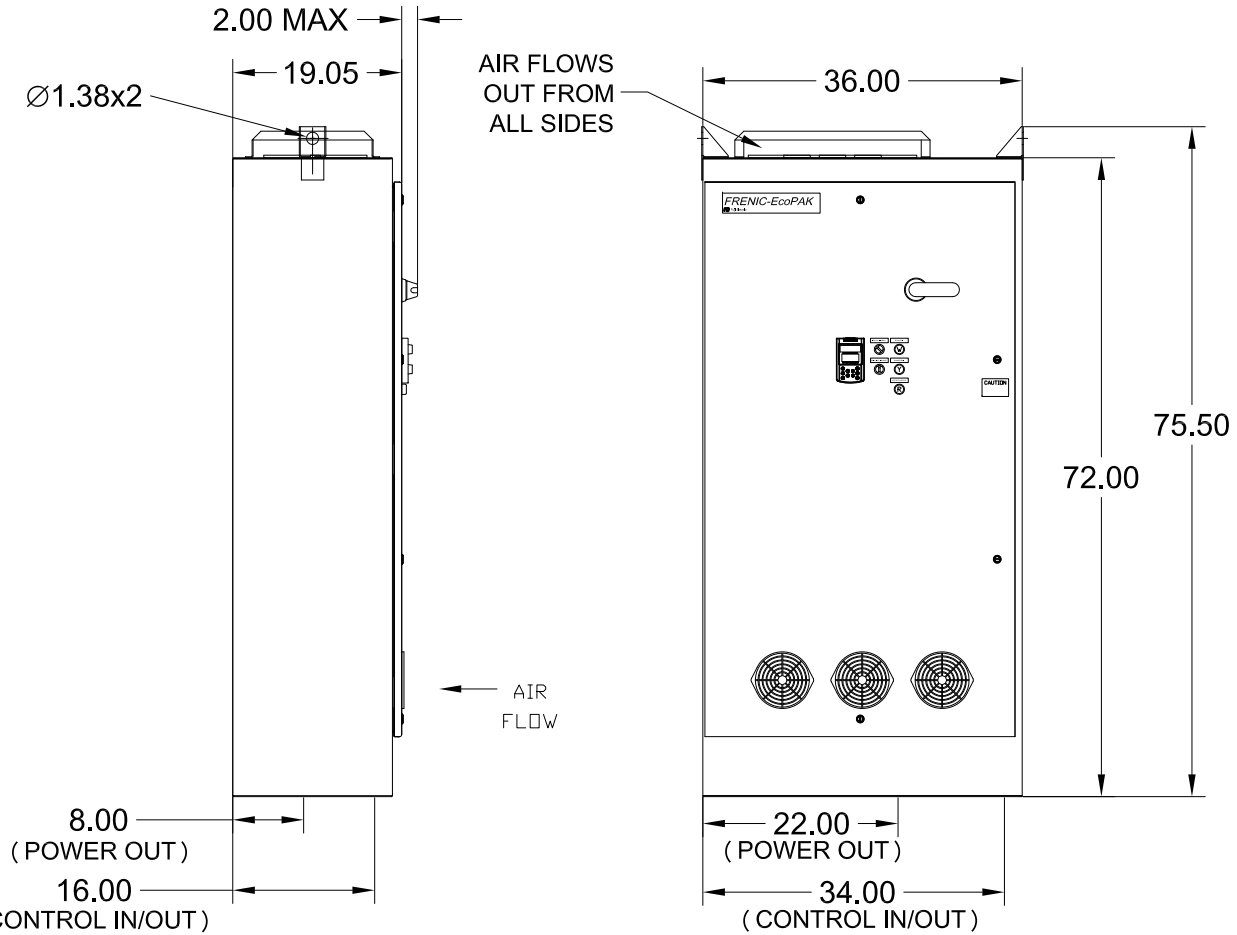
DIMENSIONS ARE IN INCHES

Fuji Electric

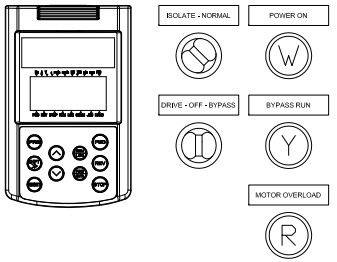
DESCRIPTION: FRENIC-EcoPAK - BYPASS & NON-BYPASS 30Hp @ 208/230V I 75Hp @ 460V NEMA 1 INSTRUCTION BOOK: SEE NOTE 3	DRN. BY: T. WEBB	DATE: 12/20/10	DWG. NO. : RDA700050
	REV. 0	REV. DATE:	REV. BY:	SHT. 1 OF 1

DIMENSIONS PROVIDED FOR ESTIMATING PURPOSES ONLY





ENLARGED VIEW OF
DOOR DEVICES



NOTES:

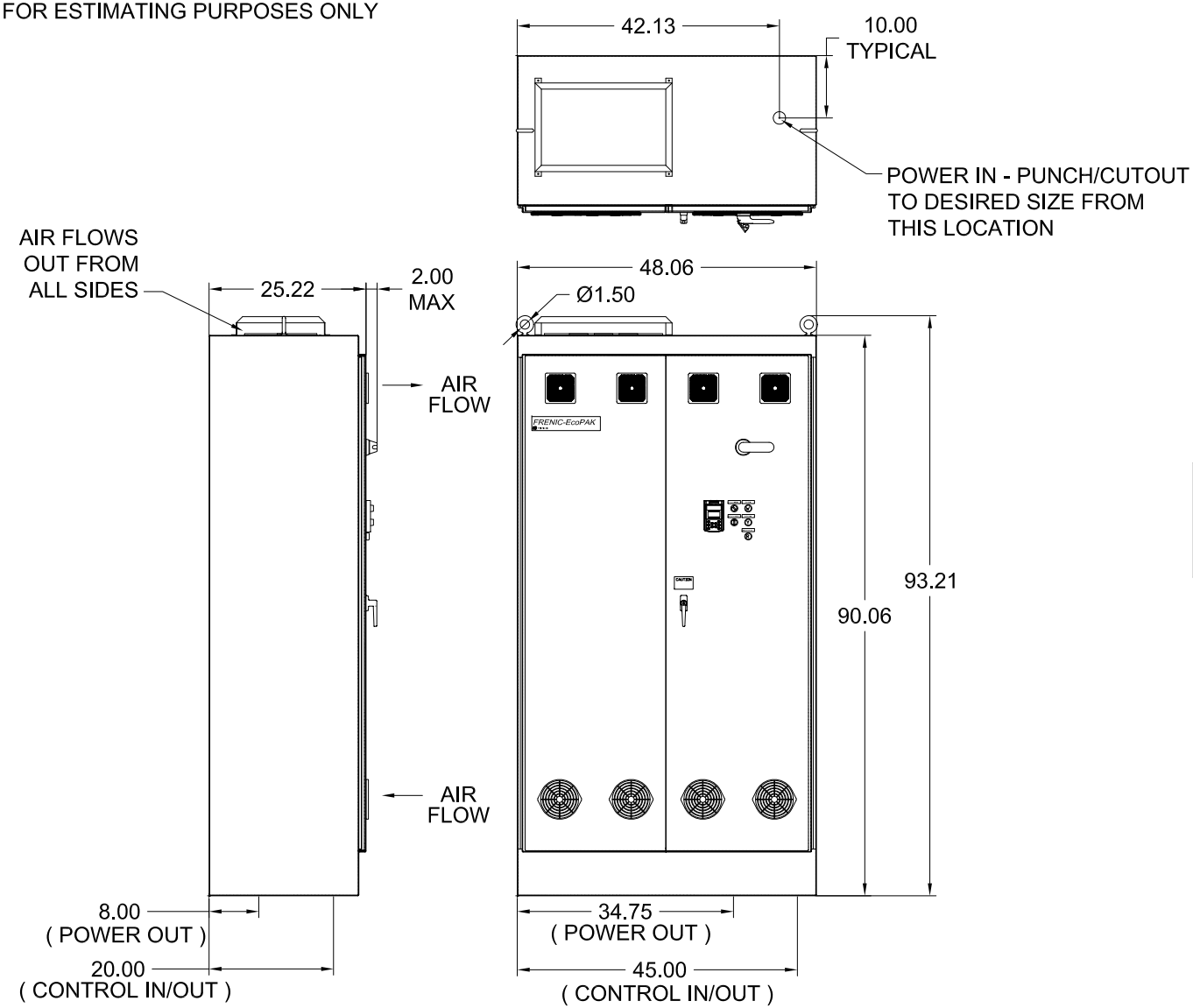
1) INSTRUCTION BOOKS: FECA-IN-105 FOR
BYPASS & FECA-IN-107 FOR BASIC BYPASS

DIMENSIONS ARE IN INCHES

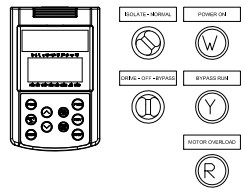
Fuji Electric

DESCRIPTION: FRENIC-EcoPAK, BYPASS 40-50Hp @ 208/230V | 100-125Hp @ 460V NEMA 1 & NEMA 12 VENTILATED INSTRUCTION BOOK: SEE NOTE 1	DRN. BY: R. MONTES	DATE: 12/09/10	DWG. NO.: RDA700045
	REV. 1 | REV. DATE: 12/16/10	REV. BY: T. WEBB	SHT. 1 OF 1

DIMENSIONS PROVIDED FOR ESTIMATING PURPOSES ONLY



ENLARGED VIEW
OF DOOR DEVICES



NOTES:

1) NON-BYPASS UNITS ONLY INCLUDE THE DOOR MOUNTED KEYPAD, ALL OTHER PILOT LIGHTS AND SELECTOR SWITCHES ARE NOT PROVIDED

2) INSTRUCTION BOOKS: FECA-IN-105 FOR BYPASS, FECA-IN-107 FOR BASIC BYPASS, & FECA-IN-106 FOR NON-BYPASS

DIMENSIONS ARE IN INCHES

Fuji Electric

DESCRIPTION: FRENIC-EcoPAK BYPASS & NON-BYPASS 60Hp @ 208/230V I 150-200Hp @ 460V NEMA 1 & NEMA 12 VENTILATED INSTRUCTION BOOK: SEE NOTE 2	DRN. BY: B. GAYLE	DATE: 06/04/09	DWG. NO.: RDA700022
	REV. 1	REV. DATE: 12/16/10	REV. BY: T. WEBB
			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
208/230VAC, 60Hz, 3PH, UL/NEMA Type 1			
2	53.00 x 12.46 x 18.09	105	229
3	53.00 x 12.46 x 18.09	105	276
5	53.00 x 12.46 x 18.09	109	361
7.5	53.00 x 12.46 x 18.09	119	548
10	53.00 x 12.46 x 18.09	124	660
15	59.00 x 16.46 x 18.09	151	877
20	59.00 x 16.46 x 18.09	163	1145
25	60.00 x 24.48 x 18.10	209	1275
30	64.00 x 26.48 x 18.60	276	1469
40	75.50 x 36.00 x 21.05	628	1934
50	75.50 x 36.00 x 21.05	679	2055
60	93.21 x 48.06 x 27.22	1256	2505
460VAC, 60Hz, 3PH, UL/NEMA Type 1			
2	53.00 x 12.46 x 18.09	105	200
3	53.00 x 12.46 x 18.09	105	258
5	53.00 x 12.46 x 18.09	105	397
7.5	53.00 x 12.46 x 18.09	108	427
10	53.00 x 12.46 x 18.09	116	632
15	53.00 x 12.46 x 18.09	119	760
20	53.00 x 12.46 x 18.09	129	918
25	59.00 x 16.46 x 18.09	159	1074
30	59.00 x 16.46 x 18.09	165	1236
40	59.00 x 16.46 x 18.09	178	1519
50	60.00 x 24.48 x 18.10	224	1805
60	60.00 x 24.48 x 18.10	228	2090
75	64.00 x 26.48 x 18.60	338	2143
100	75.50 x 36.00 x 21.05	678	2670
125	75.50 x 36.00 x 21.05	719	2909
150	93.22 x 48.06 x 27.21	1297	3481
200	93.22 x 48.06 x 27.21	1358	4217