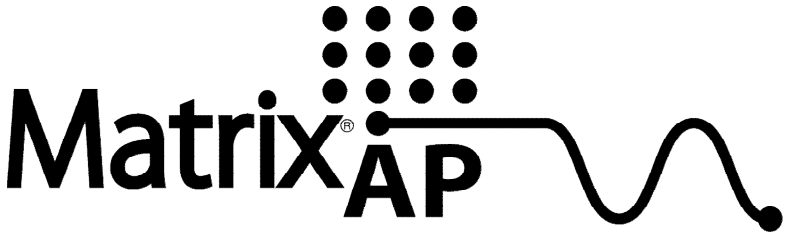
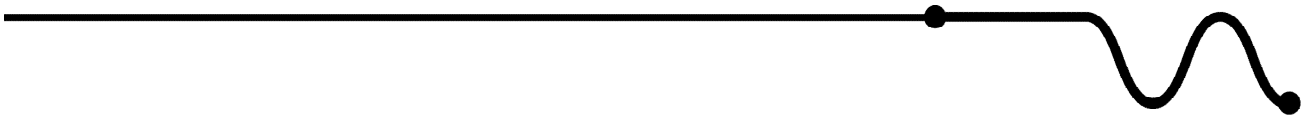
MTE
AN SL INDUSTRIES COMPANY



400 Volts, 50HZ
480 Volts, 60HZ
600 Volts, 60HZ

TECHNICAL REFERENCE MANUAL

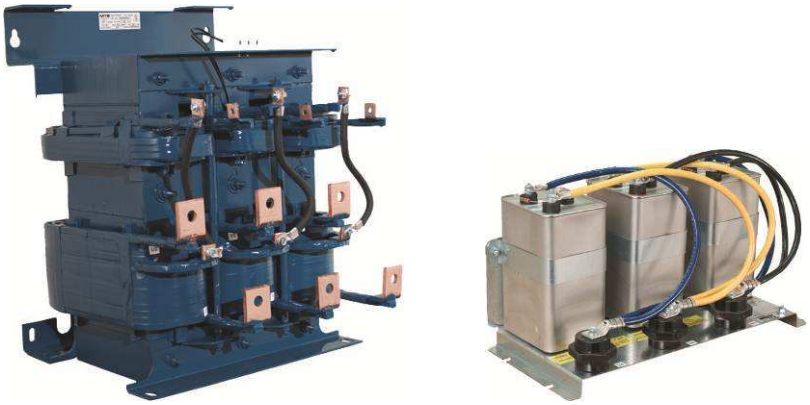


FORM: MAP-TRM-E
REL. July 2013
REV. 015

IMPORTANT USER INFORMATION

NOTICE

The MTE Corporation Matrix® AP Harmonic Filter is designed for harmonic mitigation of 6-pulse inverter drives supplying variable torque loads in a wide variety of applications. The suitability of this filter for a specific application must therefore be determined by the customer. In no event will MTE Corporation assume responsibility or liability for any direct or consequential damages resulting from the use or application of this filter. Nor will MTE Corporation assume patent liability with respect to the use of information, circuits or equipment described in this instruction manual. The Matrix AP Harmonic Filter uses a patent pending Adaptive Passive Harmonic Mitigating Reactor (AP HMR) technology to limit full load current distortion to less than 5% THID and 8% at 30% load.



MAPP0320D

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Selection Guide Lines

The Matrix® AP harmonic filter uses patented Harmonics Mitigating Reactor (HMR) technology to limit full load current distortion to less than 5% THID.

Filters for variable torque AC drives rated 7.5 Hp and above should be selected for a filter output current rating greater than or equal to the motor current rating. If the motor current rating is not available, use the NEC motor current rating.

Filters for variable torque AC drives rated 2 – 5 Hp should be selected for a filter output current rating greater than or equal to 105% of the motor current rating. If the motor current rating is not available, select on the basis of 105% of the NEC motor current rating.

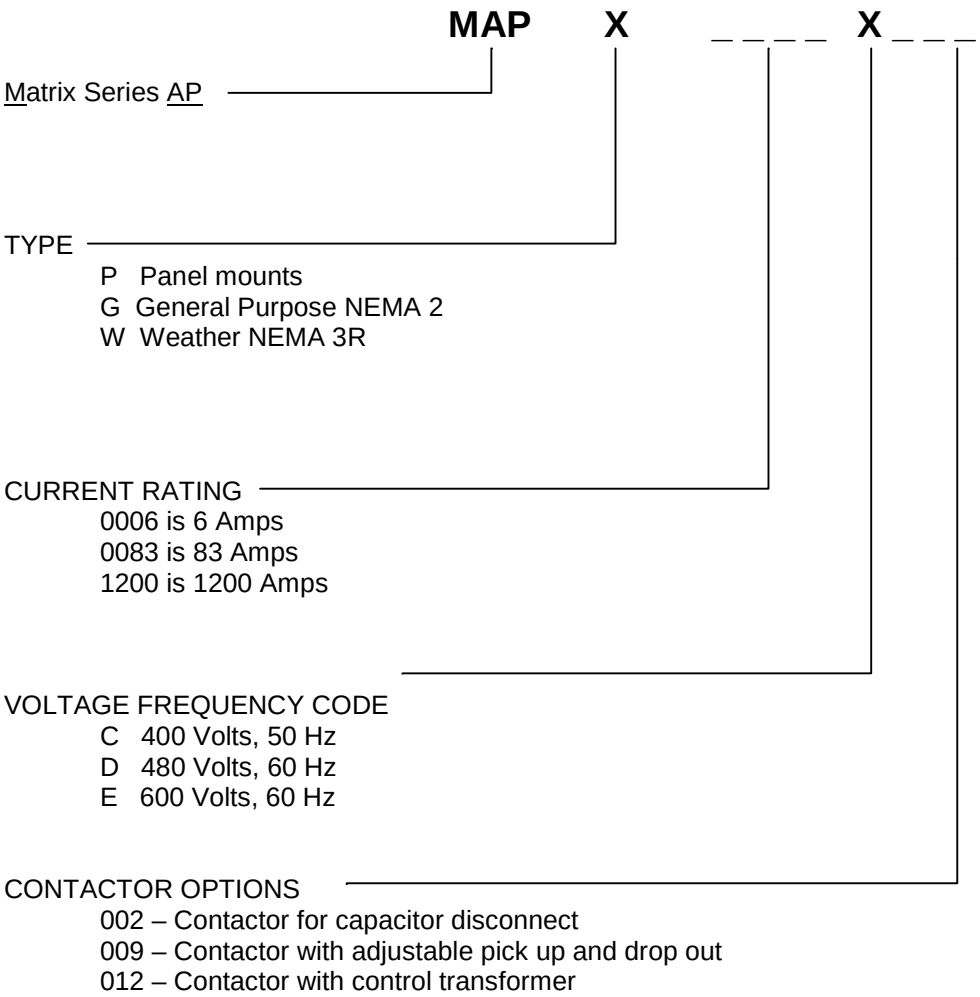
Filters for variable torque AC drives rated less than 1.5 Hp should be selected for an output current rating greater than or equal to 110% of the motor current rating or 110% of the NEC motor current rating.

For constant torque, determine the maximum current through the filter and size accordingly. For phase controlled DC drive applications, select filter current rating per application note “Matrix Filter with Phase Controlled DC Driver.”

Where a single filter is used to feed multiple drives, the output current rating of the filter should be selected to equal the total current rating plus 10% of the individual drives when calculated according to the instructions above. Note: THID may exceed 5% at light loading; see Figure 1 for the THID performance details.

This document incorporates advance search and view features compatible with Adobe Acrobat 4 and above PDF reader software.

PART NUMBER CODES



ENCLOSURE OPTION

Option -400**
Standard NEMA 3R enclosure with optional rodent / serpent screen
Option 400 provides intake exhaust air screens with (¼ X ¼) mesh openings.

Change above listed catalog number from **MAPWxxxxx** to **MAPWxxxx400** and add **$400.00** to the list price.

**** Note: Call factory for availability. Option may result in extended lead times.**

Matrix AP Specifications:

Generator sizing note: *Generator sizing is best completed by sizing programs or help from a generator manufacturing representative. Identify every load type and size that will be powered from the generator. If non-linear loads are present the generator may need to be oversized.*

Generator rated KVA minimum load >= Matrix rated current x √ 3 generator voltage
FLA load current <= Matrix filter rated current

Service Conditions

Load: 6-pulse variable torque rectifier only

Input voltage(s): 480V Version (PN#'s MAPxxxxxD) - 480 VAC +/- 10%, 60 ± 0.75 Hz, 3 phase
400V Version (PN#'s MAPxxxxxC) - 400 VAC +/- 10%. 50 ± 0.75 Hz. 3 phase
600V Version (PN#'s MAPxxxxxE) - 600 VAC +/- 10%. 60 ± 0.75 Hz. 3 phase

Input voltage line unbalance: 1% maximum to ensure performance guarantee.

Maximum source impedance: 6.00% to ensure performance guarantee.
Matrix AP works with Gensets that have source impedance of ~ 15%

Minimum source impedance: 1.5%

Service Factor: 1.00

Overload: 150% for 1 minute duration with 10% output voltage reduction of nominal of voltage.

Ambient Temperature (Operating): Refer to figure 5 for temperature de-rating.

Enclosed Filters:	320A and above:	-40 to +45 degrees C
	Below 320A:	-40 to +40 degrees C
Open Panel Filters:	-40 to +50 degrees C	
Storage Temperature:	-40 to +90 degrees C	

Altitude: 0 to 3300 Feet above sea level. Refer to figure 4 for altitude de-rating.

Relative Humidity: 0 to 95% non-condensing

Over Voltage: Category II

Agency Approvals

UL and cUL listed to UL508 Type MX and CSA-C22.2 No 14-95
File E180243 (3 – 1000 HP, 120VAC through 600VAC 50, 50/60, 60 Hz Three Phase)
CE Marked, 400VAC 50 Hz

Notes (SCCR):

The Short Circuit Current Rating (SCCR) is not required under Exception No.1 of UL508A SB4.2.1 effective 4/25/06. This exception also applies to all the Contactor Options (002, 009, 012, and similar), where the Contactors are separated from the Main Power path by exempt components (such as Reactors) of sufficient Impedance, which is assured in case of the Reactors that are integral components of our Filter.

Performance

Total Harmonic Current Distortion:

8% MAX at 30% load, 5% MAX at FULL LOAD

Enclosures

MTE enclosures are designed to provide a degree of protection for electrical components and prevent incidental personnel contact with the enclosed equipment. Depending on the enclosure selected, these enclosures meet the requirements of NEMA 1, 2 or 3R.

An approximate cross reference guide between NEMA, UL, CSA and IEC enclosure follows.

Type 1 NEMA / IEC IP20 enclosure**:**

Are designed for indoor use and will provide protection against contact with the enclosed equipment.

Type 2 NEMA / IEC IP20 enclosure:

Are designed for indoor use and will provide protection against contact with the enclosed equipment and provide a degree of protection against limited amounts of falling water and dirt.

Type 3R NEMA / IEC IP21 enclosure:

Are designed for outdoor use primarily to provide protection against contact with the enclosed equipment and provide a degree of protection against falling rain, sleet and external ice formation.

Warranty

Three years from the date of shipment.

Over Temperature Switch Ratings

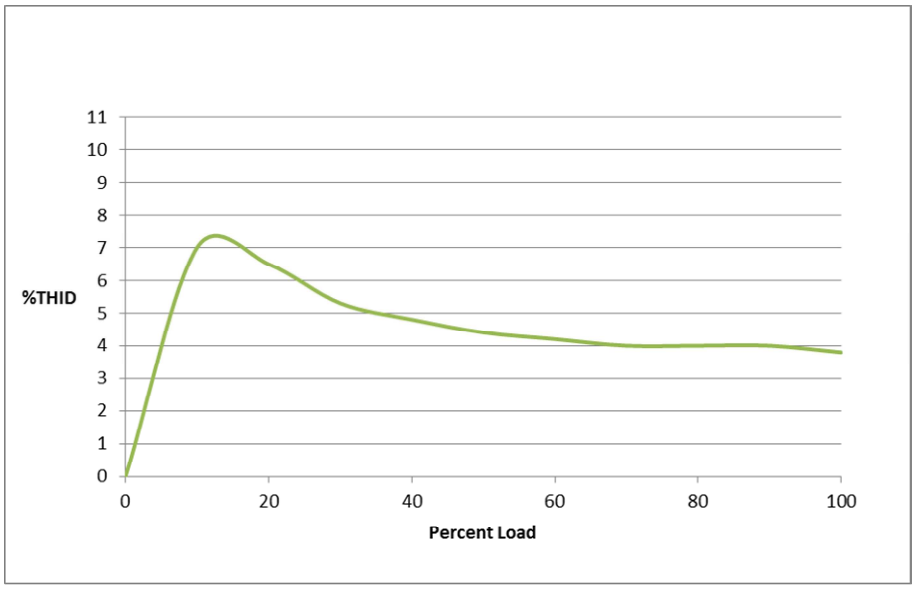
Table 1

NC Switch opens at 180 Deg. +/- 5 deg C		
Current Amps	**Voltage**	**Contact Load**
6	120 AC	Resistive Loads
3	120 AC	Inductive Loads
3	240 AC	Resistive Loads
2.5	240 AC	Inductive Loads
8	12 VDC	Resistive Loads
4	24 VDC	Resistive Loads

Typical Performance Data

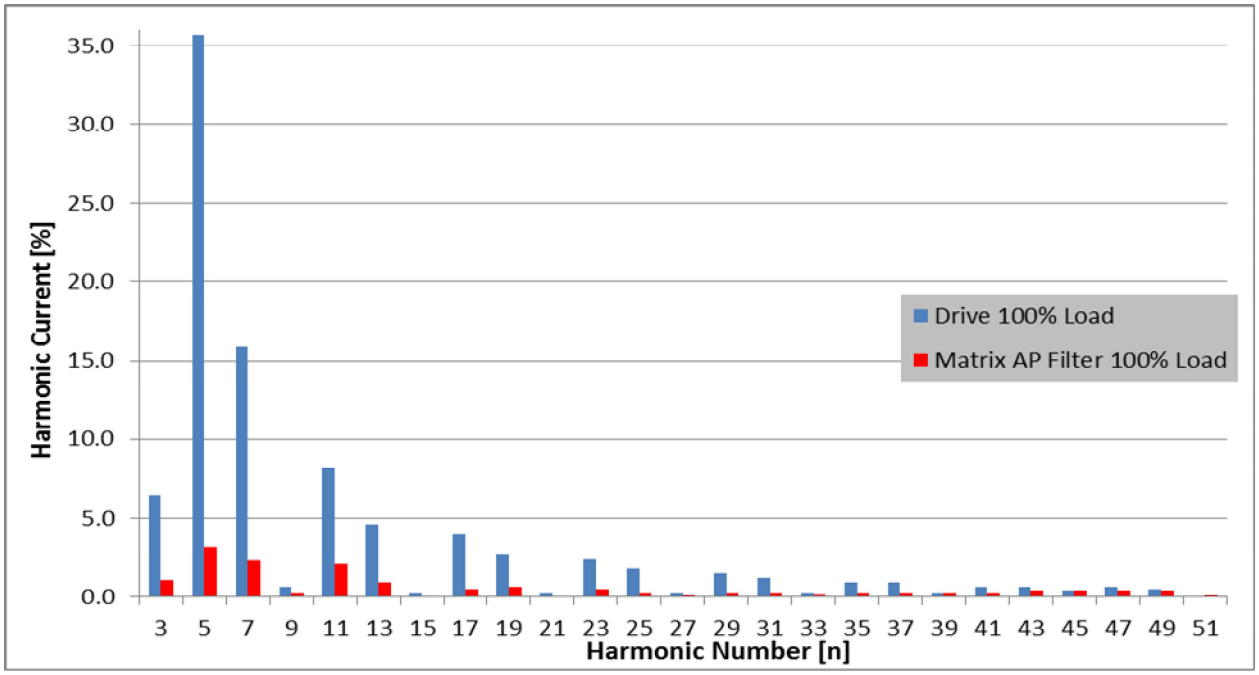
Load effect on THID

Figure 1



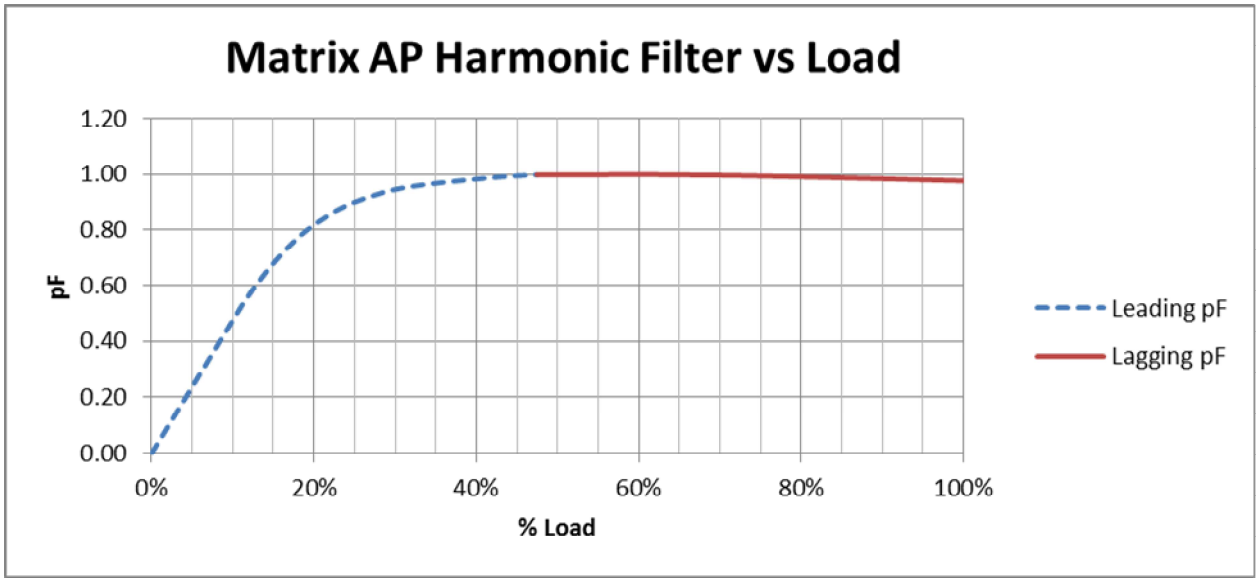
Typical Harmonic Spectrum With and Without Matrix AP Harmonic Filter

Figure 2



Power Factor

Figure 3



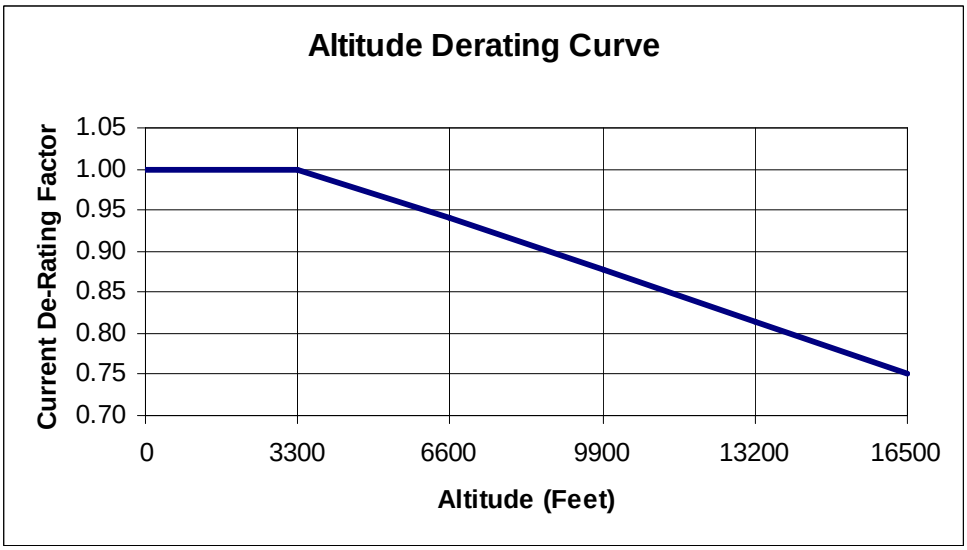
Performance with Unbalanced Line Voltage (Typical)

Table 2

All Components at Nominal Values and Worse Case Service Conditions	
100% Load	
Nominal THID	4.2%
1% Unbalance	4.4%
2% Unbalance	4.8%
3% Unbalance	5.4%
30% Load	
Nominal THID	7.0%
1% Unbalance	7.3%
2% Unbalance	7.9%
3% Unbalance	8.8%

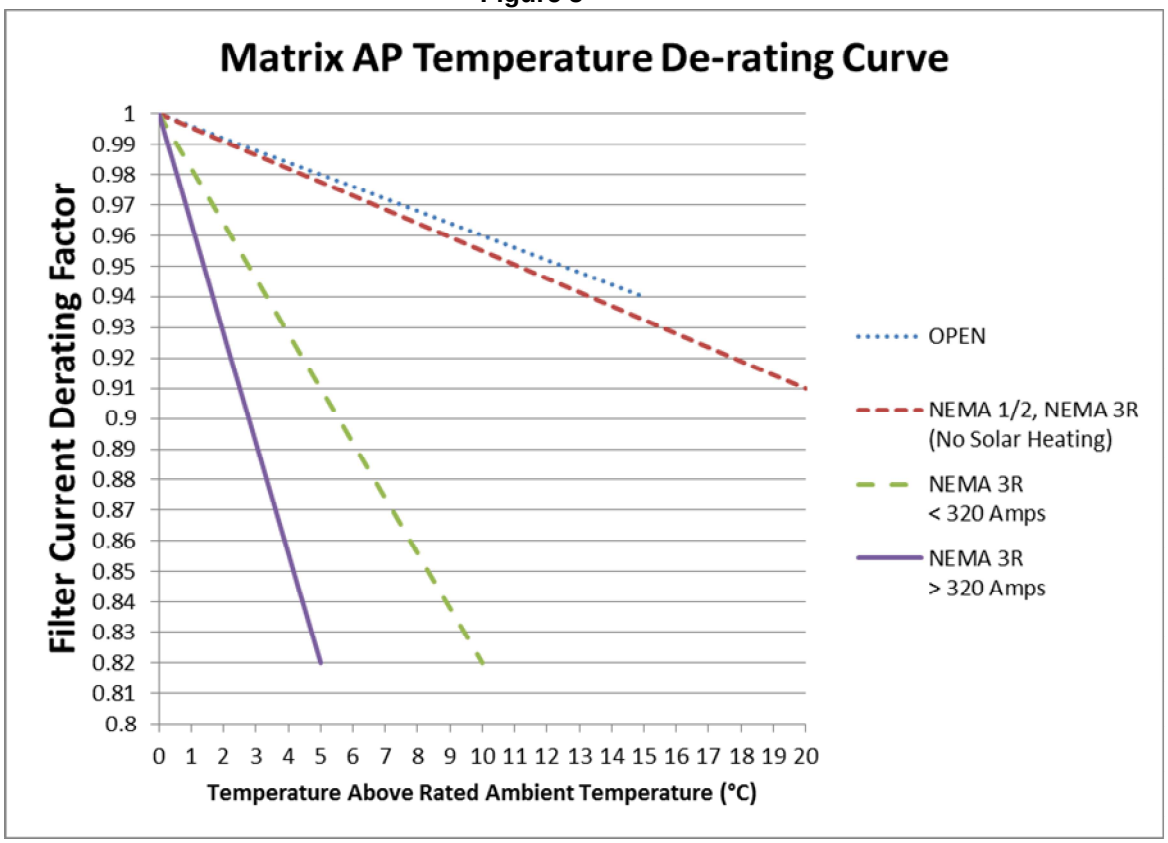
Altitude De-rating Curve

Figure 4



Temperature De-rating Curve

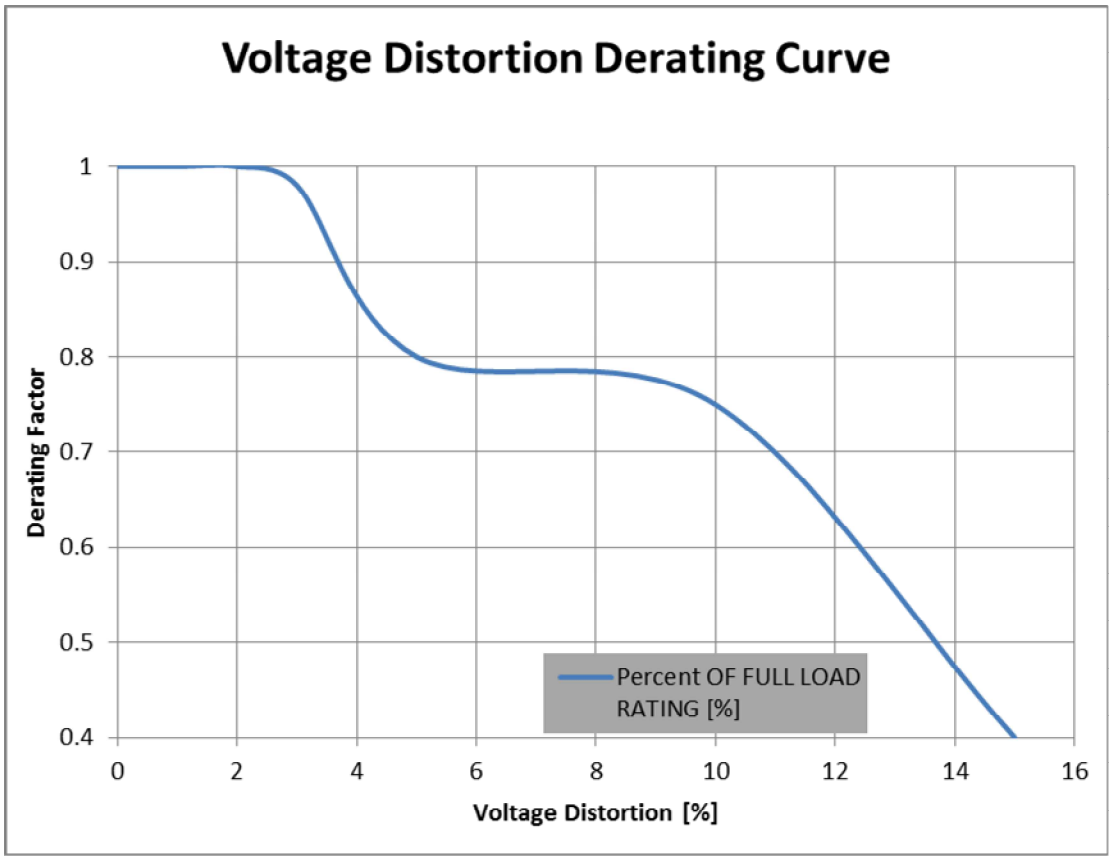
Figure 5



Note: Contact factory if Ambient is 20 °C above temperature rating.
See or click Specifications for temperature ratings

Voltage Distortion De-rating Curve

Figure 6



This plot assists in proper de-rating of a Matrix AP Harmonic Filter in environments with a given voltage distortion. Example: In a system with 10% voltage distortion, a Matrix filter will need to be oversized by 25% to obtain the same performance as an appropriate filter in a 0% distortion environment.

MATRIX AP 400 VOLTS, 50Hz

Selection Tables

OPEN PANEL & GENERAL PURPOSE NEMA 1/2

Filter Max Load Amps	Motor KW	NEC Motor Amps	Filter Style	
			OPEN PANEL	GEN'L PURPOSE NEMA 2
			Cat. No.	Cat. No.
6	2.2	4.8	MAPP0006C	MAPG0006C
8	3.7	7.6	MAPP0008C	MAPG0008C
11	5.5	11	MAPP0011C	MAPG0011C
14	7.5	14	MAPP0014C	MAPG0014C
21	11	21	MAPP0021C	MAPG0021C
27	15	27	MAPP0027C	MAPG0027C
34	18.5	34	MAPP0034C	MAPG0034C
44	22	40	MAPP0044C	MAPG0044C
52	30	52	MAPP0052C	MAPG0052C
66	37	65	MAPP0066C	MAPG0066C
83	45	77	MAPP0083C	MAPG0083C
103	55	96	MAPP0103C	MAPG0103C
128	75	124	MAPP0128C	MAPG0128C
165	90	156	MAPP0165C	MAPG0165C
208	110	180	MAPP0208C	MAPG0208C
240	150	240	MAPP0240C	MAPG0240C
320	185	302	MAPP0320C	MAPG0320C
403	220	361	MAPP0403C	MAPG0403C
482	280	477	MAPP0482C	MAPG0482C
636	375	590	MAPP0636C	MAPG0636C
786	450	708	MAPP0786C	MAPG0786C
850	525	840	MAPP0850C	MAPG0850C
1000	630	1000	MAPP1000C	MAPG1000C
1200	750	1160	MAPP1200C	MAPG1200C

MATRIX AP 400 VOLTS, 50Hz

Selection Tables

NEMA 3R Enclosures

Filter Max Load Amps	Motor KW	NEC Motor Amps	GEN'L PURPOSE NEMA 3R
			Cat. No.
6	2.2	4.8	MAPW0006C
8	3.7	7.6	MAPW0008C
11	5.5	11	MAPW0011C
14	7.5	14	MAPW0014C
21	11	21	MAPW0021C
27	15	27	MAPW0027C
34	18.5	34	MAPW0034C
44	22	40	MAPW0044C
52	30	52	MAPW0052C
66	37	65	MAPW0066C
83	45	77	MAPW0083C
103	55	96	MAPW0103C
128	75	124	MAPW0128C
165	90	156	MAPW0165C
208	110	180	MAPW0208C
240	150	240	MAPW0240C
320	185	302	MAPW0320C
403	220	361	MAPW0403C
482	280	477	MAPW0482C
636	375	590	MAPW0636C
786	450	708	MAPW0786C
850	525	840	MAPW0850C
1000	630	1050	MAPW1000C
1200	750	1160	MAPW1200C

MATRIX AP 400 VOLTS, 50Hz

Ratings

Watts loss

Table 10

Maximum Output Amps RMS	Efficiency (Typical) (%)	400V Power Dissipation @ Rated Current (Typical) (Watts)
6	97.5%	114
8	97.6%	149
11	97.9%	180
14	98.1%	206
21	98.6%	235
27	98.7%	266
34	98.8%	298
44	98.9%	356
52	99.0%	388
66	99.1%	459
83	99.1%	565
103	99.2%	660
128	99.0%	973
165	99.2%	1,030
208	99.2%	1,263
240	99.2%	1,423
320	99.4%	1,450
403	99.4%	1,816
482	99.5%	2,008
636	99.5%	2,359
786	99.6%	2,604
850	99.6%	2,974
1000	99.5%	3,954
1200	99.6%	4,136

MATRIX AP 400 VOLTS, 50Hz

Regulation table

Table 11

FILTER VOLTAGE REGULATION		400 VAC
MAXIMUM OUTPUT VOLTAGE AT NO LOAD	RMS PEAK	418 591
MINIMUM OUTPUT VOLTAGE AT FULL LOAD	RMS PEAK	384 543
* MAXIMUM PCC VOLTAGE WITH 6% SOURCE IMPEDANCE	RMS PEAK	408 577

* Note: PCC is the point of common coupling with the power distribution system

MATRIX AP 400 VOLTS, 50Hz

Capacitor Currents

Table 12

Filter Current Rating Amps RMS	Capacitor Current 400V (Typical) Amps RMS
6	2.145
8	3.52
11	4.84
14	5.39
21	7.48
27	10.23
34	13.145
44	15.983
52	19.25
66	24.904
83	31.196
103	38.071
128	43.978
165	55.033
208	72.666
240	80.63
320	104.709
403	138.82
482	157.553
636	218.581
786	271.865
850	299.255
1000	341.11
1200	420

Note: Ratings are based on IEC AC-3 specifications.

MATRIX AP 400 VOLTS, 50Hz

Open Style Size and Weights

Table 13

Amps rating	Catalog Part Number	Total Weight Lbs.	HMR Size Inches	HMR Ref. Figure	Cap-Panel P.N.	Capacitor / Capacitor assemblies size Inches	Cap Ref. Figure
6	MAPP0006C	16	8.7"H X 8"W X 5.5"D	Figure 10	CAP-350TP	7.5"H X 2.9"D	Figure 20
8	MAPP0008C	17	8.7"H X 8"W X 5.5"D	Figure 10	CAP-351TP	7.5"H X 2.9"D	Figure 20
11	MAPP0011C	26	9.9"H X 9"W X 4.8"D	Figure 10	CAP-352TP	7.5"H X 2.9"D	Figure 20
14	MAPP0014C	30	9.8"H X 9"W X 5.25"D	Figure 10	CAP-353TP	7.5"H X 3.9"D	Figure 20
21	MAPP0021C	47	11.7"H X 10.5"W X 6.6"D	Figure 10	CAP-342TP	7.5"H X 3.9"D	Figure 20
27	MAPP0027C	52	11.7"H X 10.5"W X 7"D	Figure 10	CAP-354TP	7.5"H X 4.6"D	Figure 20
34	MAPP0034C	62	11.7"H X 10.5"W X 7.6"D	Figure 10	CAP-355TP	9.1"H X 4.6"D	Figure 20
44	MAPP0044C	74	11.7"H X 10.5"W X 8"D	Figure 10	CAP-356TP	9.1"H X 4.6"D	Figure 20
52	MAPP0052C	94	14"H X 12"W X 9"D	Figure 11	CAP-357TP	10.6"H X 4.6"D	Figure 20
66	MAPP0066C	107	14"H X 12"W X 9"D	Figure 11	CAP-358TP	10.6"H X 4.6"D	Figure 20
83	MAPP0083C	135	14"H X 12"W X 10.9"D	Figure 11	CAP-359TP	10.6"H X 4.6"D	Figure 20
103	MAPP0103C	145	14"H X 12"W X 10.82"D	Figure 11	CAP-360TP	10.6"H X 4.6"D	Figure 20
128	MAPP0128C	165	20"H X 15.25"W X 10.7"D	Figure 12	594	6.9"H X 16.3"W X 7.6"D	Figure 21
165	MAPP0165C	223	20"H X15.25"W X 11.75"D	Figure 12	544	7.9"H X 16.3"W X 7.6"D	Figure 21
208	MAPP0208C	237	20"H X 15.25"W X 11.85"D	Figure 12	543	8.9"H X 16.3"W X7.6"D	Figure 21
240	MAPP0240C	327	20"H X 15.25"W X 12.75"D	Figure 12	595	7.9"H X 16.3"W X 7.6"D	Figure 21
320	MAPP0320C	390	20"H X 15.25"W X 14.8"D	Figure 12	596	10.7" X 16.3"W X 7.6"D	Figure 21
403	MAPP0403C	433	23.25"H X 15.25"W X13.86"D	Figure 13	597	11.5"H X 16.3" X 7.6"D	Figure 21
482	MAPP0482C	483	23.25"H X 15.25"W X14.77"D	Figure 13	595	7.9"H X 16.3"W X 7.6"D	Figure 21
					595	7.9"H X 16.3"W X 7.6"D	Figure 21
636	MAPP0636C	736	26"H X 24"W X 16.5"D	Figure 15	596	10.7" X 16.3"W X 7.6"D	Figure 21
					596	10.7" X 16.3"W X 7.6"D	Figure 21
786	MAPP0786C	911	26"H X 24"W X 17.8"D	Figure 15	597	11.5H" X 16.3" X 7.6"D	Figure 21
					597	11.5H" X 16.3" X 7.6"D	Figure 21
850	MAPP0850C	983	26"H X 24"W X 20.3"D	Figure 15	596	10.7" X 16.3"W X 7.6"D	Figure 21
					596	10.7" X 16.3"W X 7.6"D	Figure 21
					595	7.9"H X 16.3"W X 7.6"D	Figure 21
1000	MAPP1000C	1137	26"H X 24"W X 21.7"D	Figure 15	598	10.7H" X 16.3" X 7.6"D	Figure 21
					598	10.7H" X 16.3" X 7.6"D	Figure 21
					598	10.7H" X 16.3" X 7.6"D	Figure 21
1200	MAPP1200C	1297	26"H X 24"W X 22.2"D	Figure 15	597	11.5H" X 16.3" X 7.6"D	Figure 21
					597	11.5H" X 16.3" X 7.6"D	Figure 21
					597	11.5H" X 16.3" X 7.6"D	Figure 21

MATRIX AP 400 VOLTS, 50Hz

Enclosed Unit Size and Weights

Table 14

Filter Amps	NEMA 2	Enclosure	Weight	NEMA 3R	Enclosure	Weight	Figure
6	MAPG0006C	CAB-12AP2	65	MAPW0006C	CAB-12AP3	73	Figure 30
8	MAPG0008C	CAB-12AP2	65	MAPW0008C	CAB-12AP3	73	Figure 30
11	MAPG0011C	CAB-12AP2	75	MAPW0011C	CAB-12AP3	82	Figure 30
14	MAPG0014C	CAB-12AP2	81	MAPW0014C	CAB-12AP3	88	Figure 30
21	MAPG0021C	CAB-12AP2	97	MAPW0021C	CAB-12AP3	105	Figure 30
27	MAPG0027C	CAB-12AP2	104	MAPW0027C	CAB-12AP3	111	Figure 30
34	MAPG0034C	CAB-12AP2	115	MAPW0034C	CAB-12AP3	123	Figure 30
44	MAPG0044C	CAB-12AP2	127	MAPW0044C	CAB-12AP3	135	Figure 30
52	MAPG0052C	CAB-17AP2	174	MAPW0052C	CAB-17AP3	181	Figure 31
66	MAPG0066C	CAB-17AP2	186	MAPW0066C	CAB-17AP3	194	Figure 31
83	MAPG0083C	CAB-17AP2	210	MAPW0083C	CAB-17AP3	217	Figure 31
103	MAPG0103C	CAB-17AP2	221	MAPW0103C	CAB-17AP3	228	Figure 31
128	MAPG0128C	CAB-26AP2	361	MAPW0128C	CAB-26AP3	374	Figure 32
165	MAPG0165C	CAB-26AP2	429	MAPW0165C	CAB-26AP3	442	Figure 32
208	MAPG0208C	CAB-26AP2	444	MAPW0208C	CAB-26AP3	457	Figure 32
240	MAPG0240C	CAB-26AP2	476	MAPW0240C	CAB-26AP3	489	Figure 32
320	MAPG0320C	CAB-26APD2	643	MAPW0320C	CAB-26APD3	675	Figure 33
403	MAPG0403C	CAB-26APD2	637	MAPW0403C	CAB-26APD3	669	Figure 33
482	MAPG0482C	CAB-42AP2	734	MAPW0482C	CAB-42AP3	739	Figure 34
636	MAPG0636C	CAB-42AP2	1111	MAPW0636C	CAB-42AP3	1116	Figure 34
786	MAPG0786C	CAB-42AP2	1260	MAPW0786C	CAB-42AP3	1264	Figure 34
850	MAPG0850C	CAB48AP2	1685	MAPW0850C	CAB-48AP3	1726	Figure 35
1000	MAPG1000C	CAB48AP2	1837	MAPW1000C	CAB-48AP3	1878	Figure 35
1200	MAPG1200C	CAB48AP2	1883	MAPW1200C	CAB-48AP3	1924	Figure 35

Note: Weight is shown in pounds

MATRIX AP 400 VOLTS, 50Hz

MOUNTING PATTERNS

AP HMR Bolt Hole Mounting Patterns

Table 15

Part Number	Lbs.	Overall Size	Rear Mount Centerline	Base Mount Centerline	Mounting Holes	Figure
MAPP0006C	16	8.7”H X 8”W X 5.5”D	7”A X 7.2”B	2.8”C X 7.2”E	.28” DIA	Figure 10
MAPP0008C	17	8.7”H X 8”W X 5.5”D	7”A X 7.2”B	2.8”C X 7.2”E	.28” DIA	Figure 10
MAPP0011C	26	9.9”H X 9”W X 4.8”D	8.2”A X 8.2”B	2.75”C X 8.2”E	.28” DIA	Figure 10
MAPP0014C	30	9.8”H X 9”W X 5.25”D	8.15”A X 8.2”B	3.25”C X 8.2”E	.28” DIA	Figure 10
MAPP0021C	47	11.7”H X 10.5”W X 6.6”D	9.8”A X 9.7”B	3.5”C X 9.7”E	.28” DIA	Figure 10
MAPP0027C	52	11.7”H X 10.5”W X 7”D	9.9”A X 9.7”B	4”C X 9.7”E	.28” DIA	Figure 10
MAPP0034C	62	11.7”H X 10.5”W X 7.6”D	9.8”A X 9.7”B	4.5”C X 9.7”E	.28” DIA	Figure 10
MAPP0044C	74	11.7”H X 10.5”W X 8”D	9.8”A X 9.7”B	5”C X 9.7”E	.28” DIA	Figure 10
MAPP0052C	94	14”H X 12”W X 9”D	12”A X 11”B	5.4”C X 11”E	.340” DIA	Figure 11
MAPP0066C	107	14”H X 12”W X 9”D	12”A X 11”B	5.9”C X 11”E	.340” DIA	Figure 11
MAPP0083C	133	14”H X 12”W X 10.9”D	11.96''A x 11''B	6.5”C X 11”E	.340” DIA	Figure 11
MAPP0103C	144	14”H X 12”W X 10.8”D	12.05'A x 11''B	6.5”C X 11”E	.340” DIA	Figure 11
MAPP0128C	149	20”H X 15.25”W X 10.7”D	17.37”A X 14”B	6”C X 14”E	.413” DIA	Figure 12
MAPP0165C	257	20”H X15.25”W X 11.75”D	17.32”A X 14”B	7”C X 14”E	.413” DIA	Figure 12
MAPP0208C	270	20”H X 15.25”W X 11.85”D	17.47”A X 14”B	7”C X 14”E	.413” DIA	Figure 12
MAPP0240C	310	20”H X 15.25”W X 12.75”D	17.51”A X 14”B	8”C X 14”E	.413” DIA	Figure 12
MAPP0320C	397	20”H X 15.25”W X 14.8”D	17.55”A X 14”B	10”C x 14”E	.413” DIA	Figure 12
MAPP0403C	433	23.25”H X 15.25”W X13.86”D	20.64”A X 14”B	9.2”C x 14”E	.413” DIA	Figure 13
MAPP0482C	483	23.3”H X 15.25”W X14.77”D	20.60”A X 14”B	10.06”C X 14”E	.413” DIA	Figure 13
MAPP0636C	793	26”H X 24”W X 16.5”D	N/A	9.15”C X 22”E	1” DIA	Figure 15
MAPP0786C	970	26”H X 24”W X 17.8”D	N/A	10.65”C X 22”E	1” DIA	Figure 15
MAPP0850C	1070	26”H X 24”W X 20.03”D	N/A	10.65”C X 22”E	1” DIA	Figure 15
MAPP1000C	1213	26”H X 24”W X 21.7”D	N/A	12.15”C X 22”E	1” DIA	Figure 15
MAPP1200C	1365	26”H X 24”W X 22.2”D	N/A	13.65”C X 22”E	1” DIA	Figure 15

Use the above table and referenced figures to establish suitable reactor mounting.

MATRIX AP 400 VOLTS, 50Hz

Capacitor and Cap-panel Bolt Hole Mounting Patterns

Table 16

Part Number	CAP P.N.	Weight Lbs.	Overall Size	Rear Mount Centerline	Mounting Holes	Figure
MAPP0006C	CAP-350TP	1.8	7.5”H X 2.9”D	N/A	M12 STUD	Figure 20
MAPP0008C	CAP-351TP	2.2	7.5”H X 2.9”D	N/A	M12 STUD	Figure 20
MAPP0011C	CAP-352TP	2.3	7.5”H X 2.9”D	N/A	M12 STUD	Figure 20
MAPP0014C	CAP-353TP	2.64	7.5”H X 3.9”D	N/A	M12 STUD	Figure 20
MAPP0021C	CAP-342TP	3.2	7.5”H X 3.9”D	N/A	M12 STUD	Figure 20
MAPP0027C	CAP-354TP	4.0	7.5”H X 4.6”D	N/A	M12 STUD	Figure 20
MAPP0034C	CAP-355TP	4.1	9.1”H X 4.6”D	N/A	M12 STUD	Figure 20
MAPP0044C	CAP-356TP	5.0	9.1”H X 4.6”D	N/A	M12 STUD	Figure 20
MAPP0052C	CAP-357TP	6.0	10.6”H X 4.6”D	N/A	M12 STUD	Figure 20
MAPP0066C	CAP-358TP	6.0	10.6”H X 4.6”D	N/A	M12 STUD	Figure 20
MAPP0083C	CAP-359TP	6.45	10.6”H X 4.6”D	N/A	M12 STUD	Figure 20
MAPP0103C	CAP-360TP	6.45	10.6”H X 4.6”D	N/A	M12 STUD	Figure 20
MAPP0128C	594	16	6.9”H X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0165C	544	18	7.9”H X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0208C	543	20	8.9”H X 16.3”W X7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0240C	595	18	7.9”H X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0320C	596	23	10.7” X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0403C	597	23	11.5” X 16.3” X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0482C	595	18	7.9”H X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
	595	18	7.9”H X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0636C	596	23	10.7” X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
	596	23	10.7” X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0786C	597	23	11.5” X 16.3” X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
	597	23	11.5” X 16.3” X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0850C	596	23	10.7” X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
	596	23	10.7” X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
	595	18	7.9”H X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP1000C	598	23	10.7” X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
	598	23	10.7” X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
	598	23	10.7” X 16.3” X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP1200C	597	23	11.5” X 16.3” X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
	597	23	11.5” X 16.3” X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
	597	23	11.5” X 16.3” X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21

Note: Units above 403 amps require multiple parallel cap panels.
Use the above table and referenced figures to establish suitable Cap-panel mounting.

MATRIX AP 480 VOLTS, 60Hz

Selection Tables

OPEN PANEL & GENERAL PURPOSE NEMA 1/2

Filter Max Load Amps	Motor HP	NEC Motor Amps	Filter Style	
			OPEN PANEL	GEN'L PURPOSE NEMA 2
			Cat. No.	Cat. No.
6	3	4.8	MAPP0006D	MAPG0006D
8	5	7.6	MAPP0008D	MAPG0008D
11	7.5	11	MAPP0011D	MAPG0011D
14	10	14	MAPP0014D	MAPG0014D
21	15	21	MAPP0021D	MAPG0021D
27	20	27	MAPP0027D	MAPG0027D
34	25	34	MAPP0034D	MAPG0034D
44	30	40	MAPP0044D	MAPG0044D
52	40	52	MAPP0052D	MAPG0052D
66	50	65	MAPP0066D	MAPG0066D
83	60	77	MAPP0083D	MAPG0083D
103	75	96	MAPP0103D	MAPG0103D
128	100	124	MAPP0128D	MAPG0128D
165	125	156	MAPP0165D	MAPG0165D
208	150	180	MAPP0208D	MAPG0208D
240	200	240	MAPP0240D	MAPG0240D
320	250	302	MAPP0320D	MAPG0320D
403	300	361	MAPP0403D	MAPG0403D
482	400	477	MAPP0482D	MAPG0482D
636	500	590	MAPP0636D	MAPG0636D
786	600	708	MAPP0786D	MAPG0786D
850	700	840	MAPP0850D	MAPG0850D
1000	850	1000	MAPP1000D	MAPG1000D
1200	1000	1160	MAPP1200D	MAPG1200D

MATRIX AP 480 VOLTS, 60Hz

Selection Tables

NEMA 3R Enclosures

Filter Max Load Amps	Motor HP	NEC Motor Amps	GEN'L PURPOSE NEMA 3R
			Cat. No.
6	3	4.8	MAPW0006D
8	5	7.6	MAPW0008D
11	7.5	11	MAPW0011D
14	10	14	MAPW0014D
21	15	21	MAPW0021D
27	20	27	MAPW0027D
34	25	34	MAPW0034D
44	30	40	MAPW0044D
52	40	52	MAPW0052D
66	50	65	MAPW0066D
83	60	77	MAPW0083D
103	75	96	MAPW0103D
128	100	124	MAPW0128D
165	125	156	MAPW0165D
208	150	180	MAPW0208D
240	200	240	MAPW0240D
320	250	302	MAPW0320D
403	300	361	MAPW0403D
482	400	477	MAPW0482D
636	500	590	MAPW0636D
786	600	708	MAPW0786D
850	700	840	MAPW0850D
1000	850	1000	MAPW1000D
1200	1000	1160	MAPW1200D

MATRIX AP 480 VOLTS, 60Hz

Ratings

Watts loss

Table 20

Maximum Output Amps RMS	Efficiency (Typical) (%)	480V Power Dissipation @ Rated Current (Typical) (Watts)
6	97.5%	122
8	97.6%	158
11	97.9%	192
14	98.1%	220
21	98.6%	251
27	98.7%	283
34	98.8%	318
44	98.9%	379
52	99.0%	413
66	99.1%	488
83	99.1%	600
103	99.2%	702
128	99.0%	1,035
165	99.2%	1,096
208	99.2%	1,343
240	99.2%	1,514
320	99.4%	1,543
403	99.4%	1,932
482	99.5%	2,137
636	99.5%	2,509
786	99.6%	2,771
850	99.6%	3,163
1000	99.5%	4,206
1200	99.6%	4,400

MATRIX AP 480 VOLTS, 60Hz

Regulation table

Table 21

FILTER VOLTAGE REGULATION		480 VAC
MAXIMUM OUTPUT VOLTAGE AT NO LOAD	RMS PEAK	502 710
MINIMUM OUTPUT VOLTAGE AT FULL LOAD	RMS PEAK	460 600
*MAXIMUM PCC VOLTAGE WITH 6% SOURCE IMPEDANCE	RMS PEAK	490 693

* Note: PCC is the point of common coupling with the power distribution system

MATRIX AP 480 VOLTS, 60Hz

Capacitor Currents

Table 22

Filter Current Rating Amps RMS	Capacitor Current **480V** (Typical) Amps RMS
6	1.98
8	2.64
11	3.7
14	4.62
21	6.93
27	9.24
34	11.8
44	14.52
52	17.16
66	22.16
83	29.2
103	34.7
128	39.8
165	53.2
208	64.8
240	72.7
320	94.5
403	132.3
482	141.8
636	195.6
786	245.0
850	265.9
1000	308.6
1200	355.2

Note: Ratings are based on IEC AC-3 specifications.

MATRIX AP 480 VOLTS, 60Hz

Open Style Size and Weights

Table 23

Amps rating	Catalog Part Number	Total Weight Lbs.	HMR Size Inches	HMR Ref. Figure	Cap-Panel P.N.	Capacitor / Capacitor assemblies size Inches	Cap Ref. Figure
6	MAPP0006D	16	8.7"H X 8"W X 5.5"D	Figure 10	CAP-338TP	7.5"H X 2.9"D	Figure 20
8	MAPP0008D	17	8.7"H X 8"W X 5.5"D	Figure 10	CAP-339TP	7.5"H X 2.9"D	Figure 20
11	MAPP0011D	26	9.9"H X 9"W X 4.8"D	Figure 10	CAP-349TP	7.5"H X 2.9"D	Figure 20
14	MAPP0014D	30	9.8"H X 9"W X 5.25"D	Figure 10	CAP-340TP	7.5"H X 2.9"D	Figure 20
21	MAPP0021D	47	11.7"H X 10.5"W X 6.6"D	Figure 10	CAP-341TP	7.5"H X 3.9"D	Figure 20
27	MAPP0027D	52	11.7"H X 10.5"W X 7"D	Figure 10	CAP-342TP	7.5"H X 3.9"D	Figure 20
34	MAPP0034D	62	11.7"H X 10.5"W X 7.6"D	Figure 10	CAP-343TP	7.5"H X 3.9"D	Figure 20
44	MAPP0044D	74	11.7"H X 10.5"W X 8"D	Figure 10	CAP-344TP	7.5"H X 4.6"D	Figure 20
52	MAPP0052D	94	14"H X 12"W X 9"D	Figure 11	CAP-345TP	9.2"H X 4.6"D	Figure 20
66	MAPP0066D	107	14"H X 12"W X 9"D	Figure 11	CAP-346TP	9.2"H X 4.6"D	Figure 20
83	MAPP0083D	135	14"H X 12"W X 10.9"D	Figure 11	CAP-347TP	10.6"H X 4.6"D	Figure 20
103	MAPP0103D	145	14"H X 12"W X 10.82"D	Figure 11	CAP-348TP	10.6"H X 4.6"D	Figure 20
128	MAPP0128D	165	20"H X 15.25"W X 10.7"D	Figure 12	555	6.9"H X 16.3"W X 7.6"D	Figure 21
165	MAPP0165D	223	20"H X15.25"W X 11.75"D	Figure 12	557	6.9"H X 16.3"W X 7.6"D	Figure 21
208	MAPP0208D	237	20"H X 15.25"W X 11.85"D	Figure 12	545	7.9"H X 16.3"W X7.6"D	Figure 21
240	MAPP0240D	327	20"H X 15.25"W X 12.75"D	Figure 12	544	7.9"H X 16.3"W X 7.6"D	Figure 21
320	MAPP0320D	390	20"H X 15.25"W X 14.8"D	Figure 12	543	8.9" X 16.3"W X 7.6"D	Figure 21
403	MAPP0403D	433	23.25"H X 15.25"W X13.86"D	Figure 13	562	10.7" X 16.3" X 7.6"D	Figure 21
482	MAPP0482D	483	23.25"H X 15.25"W X14.77"D	Figure 13	544	7.9"H X 16.3"W X 7.6"D	Figure 21
					544	7.9"H X 16.3"W X 7.6"D	Figure 21
636	MAPP0636D	736	26"H X 24"W X 16.5"D	Figure 15	543	8.9" X 16.3"W X 7.6"D	Figure 21
					543	8.9" X 16.3"W X 7.6"D	Figure 21
786	MAPP0786D	911	26"H X 24"W X 17.8"D	Figure 15	562	10.7" X 16.3" X 7.6"D	Figure 21
					562	10.7" X 16.3" X 7.6"D	Figure 21
850	MAPP0850D	983	26"H X 24"W X 20.3"D	Figure 15	543	8.9" X 16.3"W X 7.6"D	Figure 21
					543	8.9" X 16.3"W X 7.6"D	Figure 21
					544	7.9"H X 16.3"W X 7.6"D	Figure 21
1000	MAPP1000D	1137	26"H X 24"W X 21.7"D	Figure 15	543	8.9" X 16.3"W X 7.6"D	Figure 21
					543	8.9" X 16.3"W X 7.6"D	Figure 21
					561	10.7" X 16.3" X 7.6"D	Figure 21
1200	MAPP1200D	1297	26"H X 24"W X 22.2"D	Figure 15	562	10.7" X 16.3" X 7.6"D	Figure 21
					562	10.7" X 16.3" X 7.6"D	Figure 21
					562	10.7" X 16.3" X 7.6"D	Figure 21

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Enclosed Unit Size and Weights

Table 24

Filter Amps	NEMA 2	Enclosure	Weight	NEMA 3R	Enclosure	Weight	Figure
6	MAPG0006D	CAB-12AP2	64	MAPW0006D	CAB-12AP3	72	Figure 30
8	MAPG0008D	CAB-12AP2	65	MAPW0008D	CAB-12AP3	73	Figure 30
11	MAPG0011D	CAB-12AP2	74	MAPW0011D	CAB-12AP3	82	Figure 30
14	MAPG0014D	CAB-12AP2	79	MAPW0014D	CAB-12AP3	87	Figure 30
21	MAPG0021D	CAB-12AP2	97	MAPW0021D	CAB-12AP3	105	Figure 30
27	MAPG0027D	CAB-12AP2	101	MAPW0027D	CAB-12AP3	109	Figure 30
34	MAPG0034D	CAB-12AP2	112	MAPW0034D	CAB-12AP3	120	Figure 30
44	MAPG0044D	CAB-12AP2	125	MAPW0044D	CAB-12AP3	133	Figure 30
52	MAPG0052D	CAB-17AP2	172	MAPW0052D	CAB-17AP3	179	Figure 31
66	MAPG0066D	CAB-17AP2	185	MAPW0066D	CAB-17AP3	192	Figure 31
83	MAPG0083D	CAB-17AP2	209	MAPW0083D	CAB-17AP3	217	Figure 31
103	MAPG0103D	CAB-17AP2	313	MAPW0103D	CAB-17AP3	321	Figure 31
128	MAPG0128D	CAB-26AP2	333	MAPW0128D	CAB-26AP3	347	Figure 32
165	MAPG0165D	CAB-26AP2	392	MAPW0165D	CAB-26AP3	406	Figure 32
208	MAPG0208D	CAB-26AP2	405	MAPW0208D	CAB-26AP3	419	Figure 32
240	MAPG0240D	CAB-26AP2	489	MAPW0240D	CAB-26AP3	503	Figure 32
320	MAPG0320D	CAB-26APD2	630	MAPW0320D	CAB-26APD3	656	Figure 33
403	MAPG0403D	CAB-26APD2	673	MAPW0403D	CAB-26APD3	700	Figure 33
482	MAPG0482D	CAB-42AP2	702	MAPW0482D	CAB-42AP3	710	Figure 34
636	MAPG0636D	CAB-42AP2	1077	MAPW0636D	CAB-42AP3	1084	Figure 34
786	MAPG0786D	CAB-42AP2	1252	MAPW0786D	CAB-42AP3	1260	Figure 34
850	MAPG0850D	CAB48AP2	1386	MAPW0850D	CAB-48AP3	1393	Figure 35
1000	MAPG1000D	CAB48AP2	1640	MAPW1000D	CAB-48AP3	1647	Figure 35
1200	MAPG1200D	CAB48AP2	1700	MAPW1200D	CAB-48AP3	1707	Figure 35

Note: Weight is shown in pounds

MATRIX AP 480 VOLTS, 60Hz

MOUNTING PATTERNS

AP HMR Bolt Hole Mounting Patterns

Table 25

Part Number	Lbs.	Overall Size	Rear Mount Centerline	Base Mount Centerline	Mounting Holes	Figure
MAPP0006D	16	8.7”H X 8”W X 5.5”D	7”A X 7.2”B	2.8”C X 7.2”E	.28” DIA	Figure 10
MAPP0008D	17	8.7”H X 8”W X 5.5”D	7”A X 7.2”B	2.8”C X 7.2”E	.28” DIA	Figure 10
MAPP0011D	26	9.9”H X 9”W X 4.8”D	8.2”A X 8.2”B	2.75”C X 8.2”E	.28” DIA	Figure 10
MAPP0014D	30	9.8”H X 9”W X 5.25”D	8.15”A X 8.2”B	3.25”C X 8.2”E	.28” DIA	Figure 10
MAPP0021D	47	11.7”H X 10.5”W X 6.6”D	9.8”A X 9.7”B	3.5”C X 9.7”E	.28” DIA	Figure 10
MAPP0027D	52	11.7”H X 10.5”W X 7”D	9.9”A X 9.7”B	4”C X 9.7”E	.28” DIA	Figure 10
MAPP0034D	62	11.7”H X 10.5”W X 7.6”D	9.8”A X 9.7”B	4.5”C X 9.7”E	.28” DIA	Figure 10
MAPP0044D	74	11.7”H X 10.5”W X 8”D	9.8”A X 9.7”B	5”C X 9.7”E	.28” DIA	Figure 10
MAPP0052D	94	14”H X 12”W X 9”D	12”A X 11”B	5.4”C X 11”E	.340” DIA	Figure 11
MAPP0066D	107	14”H X 12”W X 9”D	12”A X 11”B	5.9”C X 11”E	.340” DIA	Figure 11
MAPP0083D	133	15.7”H X 12”W X 10.7”D	11.96"A x 11"B	6.5”C X 11”E	.340” DIA	Figure 11
MAPP0103D	144	15.7”H X 12”W X 11.1”D	12.05'A x 11"B	6.5”C X 11”E	.340” DIA	Figure 11
MAPP0128D	149	20”H X 15.25”W X 10.7”D	17.37”A X 14”B	6”C X 14”E	.413” DIA	Figure 12
MAPP0165D	257	20”H X15.25”W X 11.75”D	17.32”A X 14”B	7”C X 14”E	.413” DIA	Figure 12
MAPP0208D	270	20”H X 15.25”W X 11.85”D	17.47”A X 14”B	7”C X 14”E	.413” DIA	Figure 12
MAPP0240D	310	20”H X 15.25”W X 12.75”D	17.51”A X 14”B	8”C X 14”E	.413” DIA	Figure 12
MAPP0320D	397	20”H X 15.25”W X 14.8”D	17.55”A X 14”B	10”C x 14”E	.413” DIA	Figure 12
MAPP0403D	433	23.25”H X 15.25”W X13.86”D	20.64”A X 14”B	9.2”C x 14”E	.413” DIA	Figure 13
MAPP0482D	483	23.3”H X 15.25”W X14.37”D	20.60”A X 14”B	10.06”C X 14”E	.413” DIA	Figure 13
MAPP0636D	793	26”H X 24”W X 16.5”D	N/A	9.15”C X 22”E	1” DIA	Figure 15
MAPP0786D	970	26”H X 24”W X 17.8”D	N/A	10.65”C X 22”E	1” DIA	Figure 15
MAPP0850D	1070	26”H X 24”W X 20.3”D	N/A	10.65”C X 22”E	1” DIA	Figure 15
MAPP1000D	1213	26”H X 24”W X 21.7”D	N/A	12.15”C X 22”E	1” DIA	Figure 15
MAPP1200D	1365	26”H X 24”W X 22.2”D	N/A	13.65”C X 22”E	1” DIA	Figure 15

Use the above table and referenced figures to establish suitable reactor mounting.

MATRIX AP 480 VOLTS, 60Hz

Capacitor and Cap-panel Bolt Hole Mounting Patterns

Table 26

Part Number	CAP P.N.	Weight Lbs.	Overall Size	Rear Mount Centerline	Mounting Holes	Figure
MAPP0006D	CAP-338TP	1.8	7.5"H X 2.9"D	N/A	M12 STUD	Figure 20
MAPP0008D	CAP-339TP	1.95	7.5"H X 2.9"D	N/A	M12 STUD	Figure 20
MAPP0011D	CAP-349TP	2.1	7.5"H X 2.9"D	N/A	M12 STUD	Figure 20
MAPP0014D	CAP-340TP	2.3	7.5"H X 2.9"D	N/A	M12 STUD	Figure 20
MAPP0021D	CAP-341TP	2.65	7.5"H X 3.9"D	N/A	M12 STUD	Figure 20
MAPP0027D	CAP-342TP	3.2	7.5"H X 3.9"D	N/A	M12 STUD	Figure 20
MAPP0034D	CAP-343TP	3.7	7.5"H X 3.9"D	N/A	M12 STUD	Figure 20
MAPP0044D	CAP-344TP	4.0	7.5"H X 4.6"D	N/A	M12 STUD	Figure 20
MAPP0052D	CAP-345TP	4.1	9.2"H X 4.6"D	N/A	M12 STUD	Figure 20
MAPP0066D	CAP-346TP	5.0	9.2"H X 4.6"D	N/A	M12 STUD	Figure 20
MAPP0083D	CAP-347TP	6.0	10.6"H X 4.6"D	N/A	M12 STUD	Figure 20
MAPP0103D	CAP-348TP	6.45	10.6"H X 4.6"D	N/A	M12 STUD	Figure 20
MAPP0128D	555	16	6.9"H X 16.3"W X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
MAPP0165D	557	16	6.9"H X 16.3"W X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
MAPP0208D	545	18	7.9"H X 16.3"W X7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
MAPP0240D	544	18	7.9"H X 16.3"W X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
MAPP0320D	543	20	8.9" X 16.3"W X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
MAPP0403D	562	23	10.7" X 16.3" X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
MAPP0482D	544	18	7.9"H X 16.3"W X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
	544	18	7.9"H X 16.3"W X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
MAPP0636D	543	20	8.9" X 16.3"W X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
	543	20	8.9" X 16.3"W X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
MAPP0786D	562	23	10.7" X 16.3" X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
	562	23	10.7" X 16.3" X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
MAPP0850D	543	20	8.9" X 16.3"W X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
	543	20	8.9" X 16.3"W X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
	544	18	7.9"H X 16.3"W X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
MAPP1000D	543	20	8.9" X 16.3"W X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
	543	20	8.9" X 16.3"W X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
	561	23	10.7" X 16.3" X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
MAPP1200D	562	23	10.7" X 16.3" X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
	562	23	10.7" X 16.3" X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21
	562	23	10.7" X 16.3" X 7.6"D	3.77"A x 15.81"B	.280" DIA	Figure 21

Note: Units above 403 amps require multiple parallel cap panels.
Use the above table and referenced figures to establish suitable Cap-panel mounting.

MATRIX AP 600 VOLTS, 60Hz

Selection Tables

OPEN PANEL & GENERAL PURPOSE NEMA 1/2

Filter Max Load Amps	Motor HP	NEC Motor Amps	Filter Style	
			OPEN PANEL	GEN'L PURPOSE NEMA 2
			Cat. No.	Cat. No.
6	5	6.1*	MAPP0006E	MAPG0006E
8			MAPP0008E	MAPG0008E
11	10	11	MAPP0011E	MAPG0011E
14			MAPP0014E	MAPG0014E
21	15	17	MAPP0021E	MAPG0021E
27	25	27	MAPP0027E	MAPG0027E
34	30	32	MAPP0034E	MAPG0034E
44	40	41	MAPP0044E	MAPG0044E
52	50	52	MAPP0052E	MAPG0052E
66	60	62	MAPP0066E	MAPG0066E
83	75	77	MAPP0083E	MAPG0083E
103	100	99	MAPP0103E	MAPG0103E
128	125	125	MAPP0128E	MAPG0128E
165	150	144	MAPP0165E	MAPG0165E
208	200	192	MAPP0208E	MAPG0208E
240	250	242*	MAPP0240E	MAPG0240E
320	300	289	MAPP0320E	MAPG0320E
403	400	382	MAPP0403E	MAPG0403E
482	500	472	MAPP0482E	MAPG0482E
636	600	567	MAPP0636E	MAPG0636E
786	800	755	MAPP0786E	MAPG0786E

MATRIX AP 600 VOLTS, 60Hz

Selection Tables

NEMA 3R Enclosures

Filter Max Load Amps	Motor HP	NEC Motor Amps	GEN'L PURPOSE NEMA 3R
			Cat. No.
6	5	6.1*	MAPW0006E
8			MAPW0008E
11	10	11	MAPW0011E
14			MAPW0014E
21	15	17	MAPW0021E
27	25	27	MAPW0027E
34	30	32	MAPW0034E
44	40	41	MAPW0044E
52	50	52	MAPW0052E
66	60	62	MAPW0066E
83	75	77	MAPW0083E
103	100	99	MAPW0103E
128	125	125	MAPW0128E
165	150	144	MAPW0165E
208	200	192	MAPW0208E
240	250	242*	MAPW0240E
320	300	289	MAPW0320E
403	400	382	MAPW0403E
482	500	472	MAPW0482E
636	600	567	MAPW0636E
786	800	755	MAPW0786E

MATRIX AP 600 VOLTS, 60Hz

Ratings

Watts loss

Table 30

Maximum Output Amps RMS	Efficiency (Typical) (%)	600V Power Dissipation @ Rated Current (Typical) (Watts)
6	97.6%	150
8	97.8%	183
11	98.2%	205
14	98.3%	250
21	98.7%	285
27	98.9%	304
34	99.0%	366
44	99.1%	395
52	99.1%	494
66	99.0%	655
83	99.1%	718
103	99.0%	1085
128	99.2%	1090
165	99.3%	1285
208	99.3%	1431
240	99.3%	1624
320	99.4%	2021
403	99.5%	2208
482	99.5%	2481
636	99.6%	2884
786	99.6%	3368

MATRIX AP 600 VOLTS, 60Hz

Regulation table

Table 31

FILTER VOLTAGE REGULATION		600 VAC
MAXIMUM OUTPUT VOLTAGE AT NO LOAD	RMS PEAK	627 885
MINIMUM OUTPUT VOLTAGE AT FULL LOAD	RMS PEAK	575 750
*MAXIMUM PCC VOLTAGE WITH 6% SOURCE IMPEDANCE	RMS PEAK	612 864

Note: PCC is the point of common coupling with the power distribution system

MATRIX AP 600 VOLTS, 60Hz

Capacitor Currents

Table 32

Filter Current Rating Amps RMS	Capacitor Current **600V** (Typical) Amps RMS
6	1.98
8	2.64
11	3.7
14	4.62
21	6.93
27	9.24
34	11.8
44	14.52
52	17.16
66	22.16
83	29.2
103	34.7
128	39.8
165	53.2
208	64.8
240	72.7
320	94.5
403	132.3
482	141.8
636	195.6
786	245.0

Note: Ratings are based on IEC AC-3 specifications.

MATRIX AP 600 VOLTS, 60Hz

Open Style Size and Weights

Table 33

Amps rating	Catalog Part Number	Total Weight Lbs.	HMR Size Inches	HMR Ref. Figure	Cap-Panel P.N.	Capacitor / Capacitor assemblies size Inches	Cap Ref. Figure
6	MAPP0006E	17	8.7"H X 8"W X 5.5"D	Figure 10	CAP-361TP	7.5"H X 2.9"D	Figure 20
8	MAPP0008E	26	9.8"H X 9"W X 4.8"D	Figure 10	CAP-362TP	7.5"H X 2.9"D	Figure 20
11	MAPP0011E	30	9.8"H X 9"W X 5.3"D	Figure 10	CAP-363TP	7.5"H X 2.9"D	Figure 20
14	MAPP0014E	47	11.7"H X 10.5"W X 6.6"D	Figure 10	CAP-364TP	7.5"H X 3.9"D	Figure 20
21	MAPP0021E	52	11.7"H X 10.5"W X 7.1"D	Figure 10	CAP-365TP	7.5"H X 3.9"D	Figure 20
27	MAPP0027E	62	11.7"H X 10.5"W X 7.6"D	Figure 10	CAP-366TP	7.5"H X 4.6D	Figure 20
34	MAPP0034E	74	11.7"H X 10.5"W X 8.1"D	Figure 10	CAP-367TP	7.5"H X 4.6"D	Figure 20
44	MAPP0044E	94	14"H X 12"W X 9.89"D	Figure 11	CAP-368TP	9.14"H X 4.6"D	Figure 20
52	MAPP0052E	107	14"H X 12"W X 10.3"D	Figure 11	CAP-369TP	9.14"H X 4.6"D	Figure 20
66	MAPP0066E	135	14"H X 12"W X 11"D	Figure 11	CAP-370TP	10.6"H X 4.6"D	Figure 20
83	MAPP0083E	140	14.1"H X 12"W X 11"D	Figure 11	CAP-371TP	10.6"H X 4.6"D	Figure 20
103	MAPP0103E	165	20"H X 15.3"W X 10.7"D	Figure 12	567	6.9"H X 16.3"W X 7.6"D	Figure 21
128	MAPP0128E	223	20"H X 15.3"W X 11.7"D	Figure 12	568	6.9"H X 16.3"W X 7.6"D	Figure 21
165	MAPP0165E	237	20.1"H X15.3"W X 11.9"D	Figure 12	570	6.9"H X 16.3"W X 7.6"D	Figure 21
208	MAPP0208E	337	20.1"H X 15.3"W X 13.4"D	Figure 12	572	7.9"H X 16.3"W X7.6"D	Figure 21
240	MAPP0240E	433	20"H X 15.3"W X 16.1"D	Figure 14	574	8.9"H X 16.3"W X 7.6"D	Figure 21
320	MAPP0320E	477	23.3"H X 15.3"W X 15.7"D	Figure 14	576	10.7" X 16.3"W X 7.6"D	Figure 21
403	MAPP0403E	483	23.3"H X 15.3"W X16.1"D	Figure 14	578	11.5" X 16.3" X 7.6"D	Figure 21
482	MAPP0482E	736	25.8"H X 24"W X16.7"D	Figure 16	574	8.9"H X 16.3"W X 7.6"D	Figure 21
					574	8.9"H X 16.3"W X 7.6"D	Figure 21
636	MAPP0636E	911	25.9"H X 24"W X 18.2"D	Figure 16	576	10.7" X 16.3"W X 7.6"D	Figure 21
					576	10.7" X 16.3"W X 7.6"D	Figure 21
786	MAPP0786E	1137	25"H X 24"W X 19.5"D	Figure 16	578	11.5" X 16.3" X 7.6"D	Figure 21
					578	11.5" X 16.3" X 7.6"D	Figure 21

MATRIX AP 600 VOLTS, 60Hz

Enclosed Unit Size and Weights

Table 34

Filter Amps	NEMA 2	Enclosure	Weight	NEMA 3R	Enclosure	Weight	Figure
6	MAPG0006E	CAB-12AP2	65	MAPW0006E	CAB-12AP3	73	Figure 30
8	MAPG0008E	CAB-12AP2	74	MAPW0008E	CAB-12AP3	82	Figure 30
11	MAPG0011E	CAB-12AP2	79	MAPW0011E	CAB-12AP3	87	Figure 30
14	MAPG0014E	CAB-12AP2	97	MAPW0014E	CAB-12AP3	105	Figure 30
21	MAPG0021E	CAB-12AP2	101	MAPW0021E	CAB-12AP3	109	Figure 30
27	MAPG0027E	CAB-12AP2	112	MAPW0027E	CAB-12AP3	120	Figure 30
34	MAPG0034E	CAB-12AP2	125	MAPW0034E	CAB-12AP3	133	Figure 30
44	MAPG0044E	CAB-17AP2	172	MAPW0044E	CAB-17AP3	179	Figure 31
52	MAPG0052E	CAB-17AP2	185	MAPW0052E	CAB-17AP3	192	Figure 31
66	MAPG0066E	CAB-17AP2	209	MAPW0066E	CAB-17AP3	217	Figure 31
83	MAPG0083E	CAB-17AP2	313	MAPW0083E	CAB-17AP3	338	Figure 31
103	MAPG0103E	CAB-26AP2	333	MAPW0103E	CAB-26AP3	358	Figure 32
128	MAPG0128E	CAB-26AP2	392	MAPW0128E	CAB-26AP3	417	Figure 32
165	MAPG0165E	CAB-26AP2	405	MAPW0165E	CAB-26AP3	430	Figure 32
208	MAPG0208E	CAB-26AP2	489	MAPW0208E	CAB-26AP3	514	Figure 32
240	MAPG0240E	CAB-26APD2	630	MAPW0240E	CAB-26APD3	656	Figure 33
320	MAPG0320E	CAB-26APD2	673	MAPW0320E	CAB-26APD3	700	Figure 33
403	MAPG0403E	CAB-42AP2	702	MAPW0403E	CAB-42AP3	710	Figure 34
482	MAPG0482E	CAB-42AP2	1077	MAPW0482E	CAB-42AP3	1085	Figure 34
636	MAPG0636E	CAB-42AP2	1252	MAPW0636E	CAB-42AP3	1260	Figure 34
786	MAPG0786E	CAB-48AP2	1640	MAPW0786E	CAB-48AP3	1647	Figure 35

Note: Weight is shown in pounds

MATRIX AP 600 VOLTS, 60Hz

MOUNTING PATTERNS

AP HMR Bolt Hole Mounting Patterns

Table 35

Part Number	Lbs.	Overall Size	Rear Mount Centerline	Base Mount Centerline	Mounting Holes	Figure
MAPP0006E	17	8.7”H X 8”W X 5.5”D	7”A X 7.2”B	2.8”C X 7.2”E	.28” DIA	Figure 10
MAPP0008E	26	8.7”H X 8”W X 5.5”D	8.2”A X 8.2”B	2.8”C X 8.2”E	.28” DIA	Figure 10
MAPP0011E	30	9.9”H X 9”W X 4.8”D	8.1”A X 8.2”B	3.3”C X 8.2”E	.28” DIA	Figure 10
MAPP0014E	47	9.8”H X 9”W X 5.25”D	9.9”A X 9.7”B	3.5”C X 9.7”E	.28” DIA	Figure 10
MAPP0021E	52	11.7”H X 10.5”W X 6.6”D	9.9”A X 9.7”B	4”C X 9.7”E	.28” DIA	Figure 10
MAPP0027E	62	11.7”H X 10.5”W X 7”D	9.9”A X 9.7”B	4.5”C X 9.7”E	.28” DIA	Figure 10
MAPP0034E	74	11.7”H X 10.5”W X 7.6”D	9.9”A X 9.7”B	5”C X 9.7”E	.28” DIA	Figure 10
MAPP0044E	94	11.7”H X 10.5”W X 8”D	12”A X 11”B	5.9”C X 11”E	.28” DIA	Figure 11
MAPP0052E	107	14”H X 12”W X 9”D	11.6”A X 11”B	6.4”C X 11”E	.340” DIA	Figure 11
MAPP0066E	135	14”H X 12”W X 9”D	11.8”A X 11”B	6.9”C X 11”E	.340” DIA	Figure 11
MAPP0083E	140	15.7”H X 12”W X 10.7”D	11.6"A x 11"B	6.9”C X 11”E	.340” DIA	Figure 11
MAPP0103E	165	15.7”H X 12”W X 11.1”D	17.1 x 14"B	6”C X 14”E	.340” DIA	Figure 12
MAPP0128E	223	20”H X 15.25”W X 10.7”D	17”A X 14”B	7”C X 14”E	.413” DIA	Figure 12
MAPP0165E	237	20”H X15.25”W X 11.75”D	17.4”A X 14”B	7”C X 14”E	.413” DIA	Figure 12
MAPP0208E	337	20”H X 15.25”W X 11.85”D	17.2”A X 14”B	8”C X 14”E	.413” DIA	Figure 12
MAPP0240E	433	20”H X 15.25”W X 12.75”D	17.3”A X 14”B	10”C X 14”E	.413” DIA	Figure 14
MAPP0320E	477	20”H X 15.25”W X 14.8”D	20.4”A X 14”B	10”C x 14”E	.413” DIA	Figure 14
MAPP0403E	483	23.25”H X 15.25”W X13.86”D	20.9”A X 14”B	10”C x 14”E	.413” DIA	Figure 14
MAPP0482E	736	23.3”H X 15.25”W X14.37”D	N/A	9.2”C X 22”E	.413” DIA	Figure 16
MAPP0636E	911	26”H X 24”W X 16.5”D	N/A	10.7”C X 22”E	1” DIA	Figure 16
MAPP0786E	1137	26”H X 24”W X 17.8”D	N/A	12.2”C X 22”E	1” DIA	Figure 16

Use the above table and referenced figures to establish suitable reactor mounting.

MATRIX AP 600 VOLTS, 60Hz

Capacitor and Cap-panel Bolt Hole Mounting Patterns

Table 36

Part Number	CAP P.N.	Weight Lbs.	Overall Size	Rear Mount Centerline	Mounting Holes	Figure
MAPP0006E	CAP-361TP	1.8	7.5”H X 2.9”D	N/A	M12 STUD	Figure 20
MAPP0008E	CAP-362TP	1.95	7.5”H X 2.9”D	N/A	M12 STUD	Figure 20
MAPP0011E	CAP-363TP	1.95	7.5”H X 2.9”D	N/A	M12 STUD	Figure 20
MAPP0014E	CAP-364TP	3.35	7.5”H X 2.9”D	N/A	M12 STUD	Figure 20
MAPP0021E	CAP-365TP	3.4	7.5”H X 3.9”D	N/A	M12 STUD	Figure 20
MAPP0027E	CAP-366TP	4.6	7.5”H X 3.9”D	N/A	M12 STUD	Figure 20
MAPP0034E	CAP-367TP	4.8	7.5”H X 3.9”D	N/A	M12 STUD	Figure 20
MAPP0044E	CAP-368TP	5.4	7.5”H X 4.6”D	N/A	M12 STUD	Figure 20
MAPP0052E	CAP-369TP	5.5	9.2”H X 4.6”D	N/A	M12 STUD	Figure 20
MAPP0066E	CAP-370TP	6.2	9.2”H X 4.6”D	N/A	M12 STUD	Figure 20
MAPP0083E	CAP-371TP	6.5	10.6”H X 4.6”D	N/A	M12 STUD	Figure 20
MAPP0103E	567	16	6.9”H X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0128E	568	16	6.9”H X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0165E	570	16	6.9”H X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0208E	572	18	7.9”H X 16.3”W X7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0240E	574	20	7.9”H X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0320E	576	23	8.9” X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0403E	578	25	10.7” X 16.3” X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0482E	574	20	7.9”H X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
	574	20	7.9”H X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0636E	576	23	8.9” X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
	576	23	8.9” X 16.3”W X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
MAPP0786E	578	25	10.7” X 16.3” X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21
	578	25	10.7” X 16.3” X 7.6”D	3.77”A x 15.81”B	.280” DIA	Figure 21

Note: Units above 403 amps require multiple parallel cap panels.
Use the above table and referenced figures to establish suitable Cap-panel mounting.

AP HMR MOUNTING & TERMINAL LOCATIONS

AP HMR 6 – 44 Amp (400V & 480V)

AP HMR 6 – 34 Amp (600V)

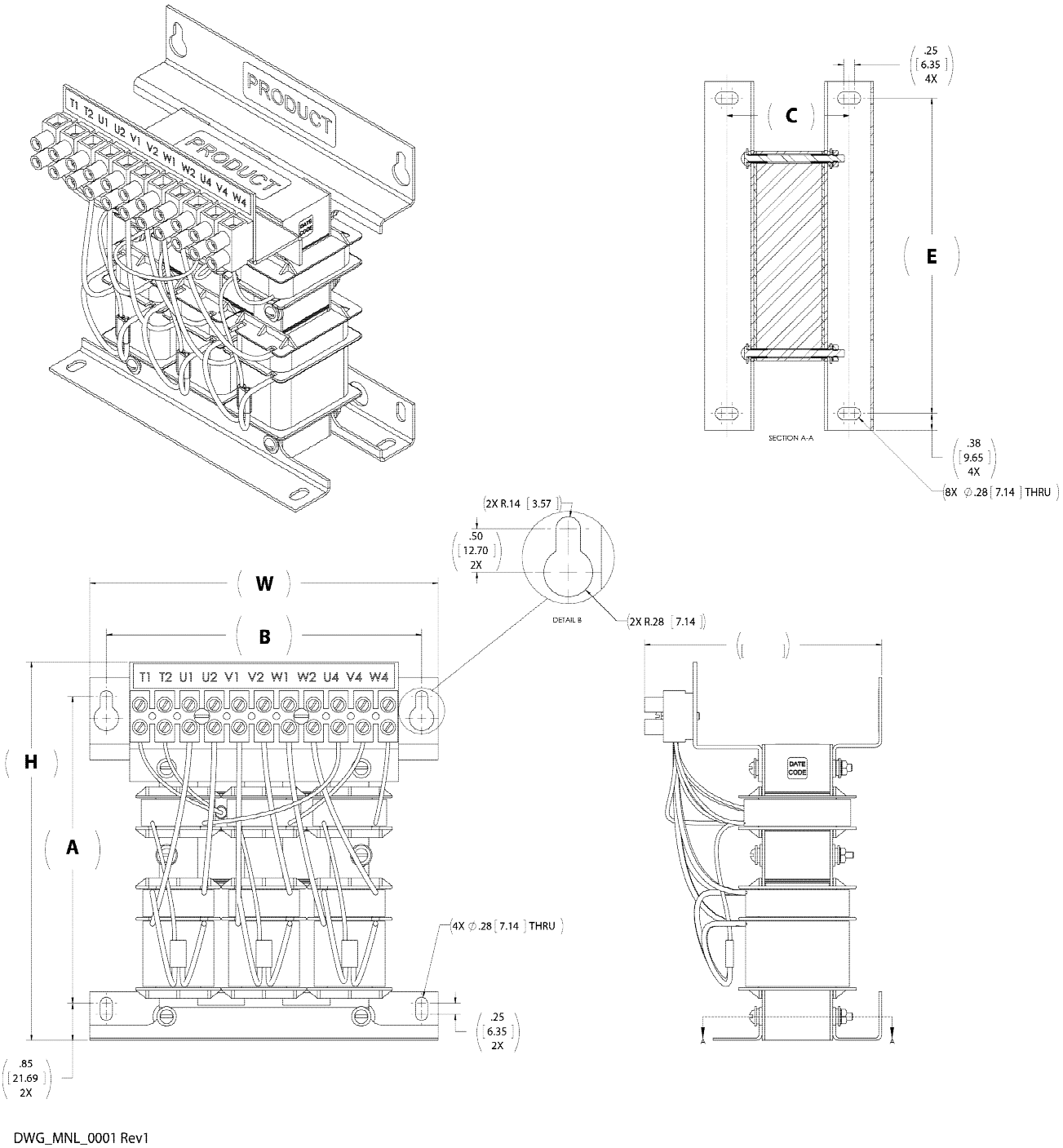


Figure 10

Refer to the MTE website, www.mtecorp.com, for Detailed Specifications.

AP HMR MOUNTING & TERMINAL LOCATIONS

AP HMR 52 – 103 Amp (400V & 480V)
AP HMR 44 – 83 Amp (600V)

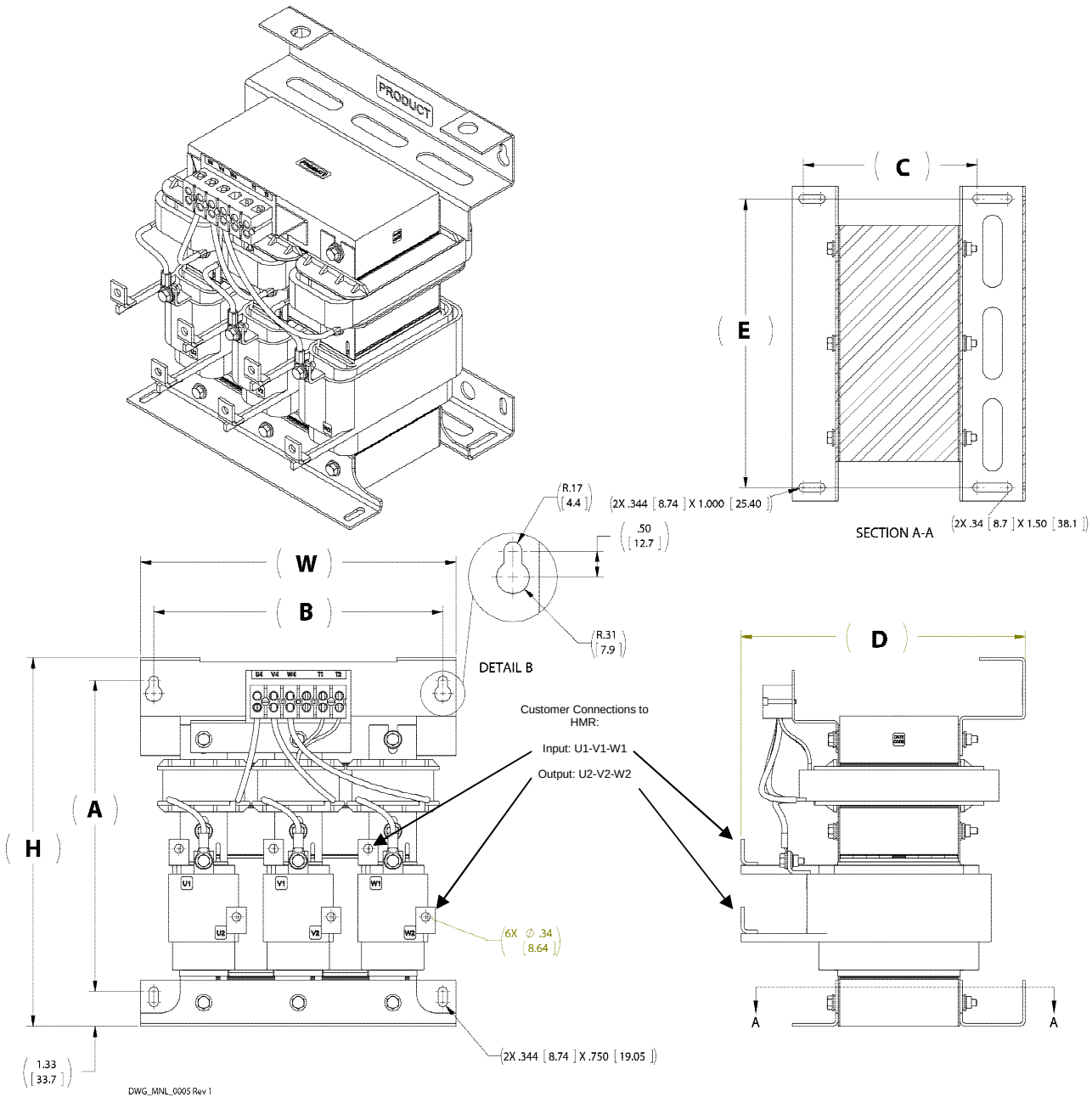


Figure 11

Refer to the MTE website, www.mtecorp.com, for Detailed Specifications.

AP HMR MOUNTING & TERMINAL LOCATIONS

AP HMR 128 – 320 Amp (400V & 480V)
AP HMR 103 – 208 Amp (600V)

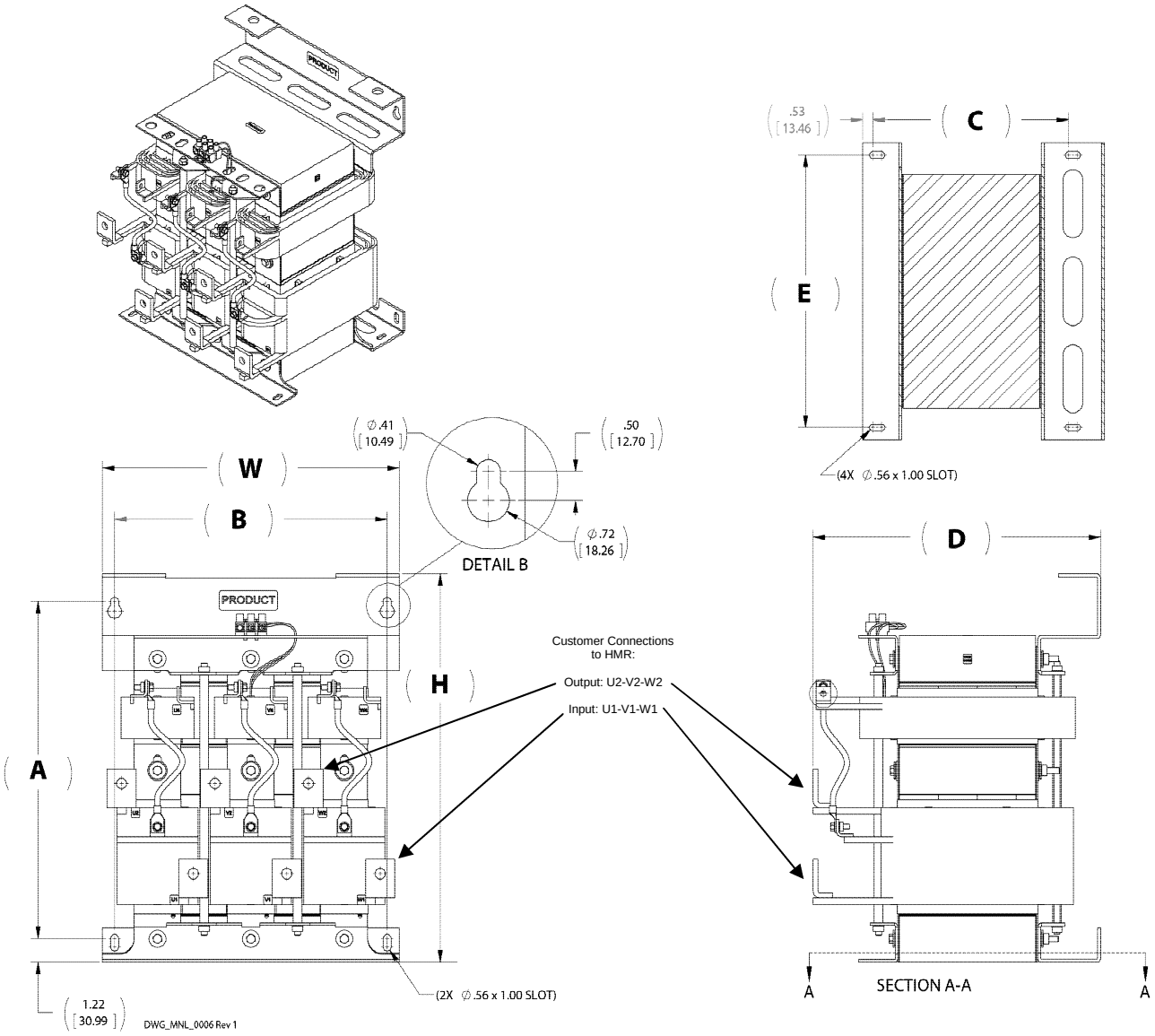


Figure 12

Refer to the MTE website, www.mtecorp.com, for Detailed Specifications.

AP HMR MOUNTING & TERMINAL LOCATIONS

AP HMR 403 – 482 Amp (400V & 480V)

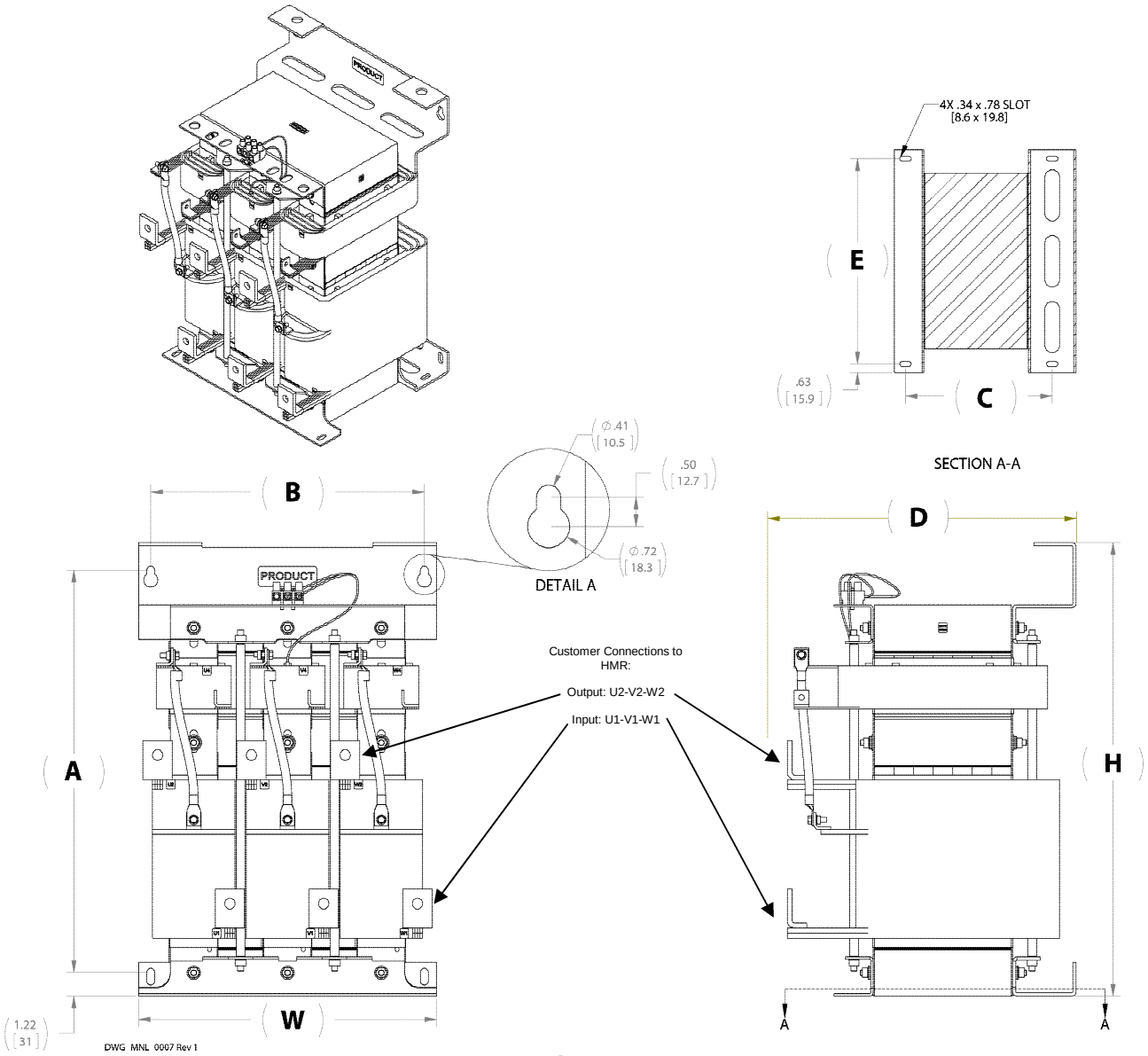


Figure 13

Refer to the MTE website, www.mtecorp.com, for Detailed Specifications.

AP HMR MOUNTING & TERMINAL LOCATIONS

AP HMR 240 – 403 Amp (600V)

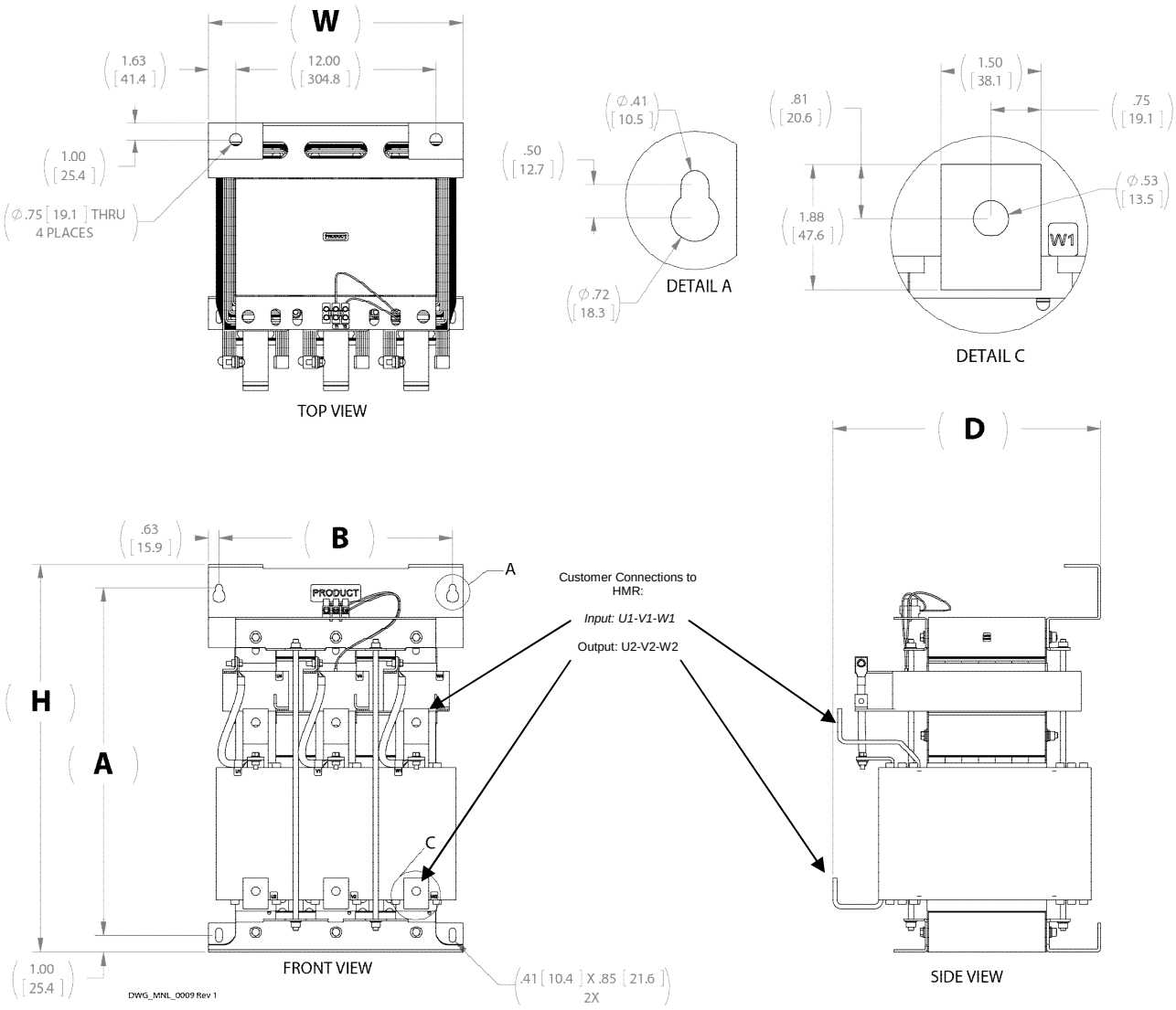


Figure 14

Refer to the MTE website, www.mtecorp.com, for Detailed Specifications.

AP HMR MOUNTING & TERMINAL LOCATIONS

AP HMR 636 – 1200 Amp (400V & 480V)

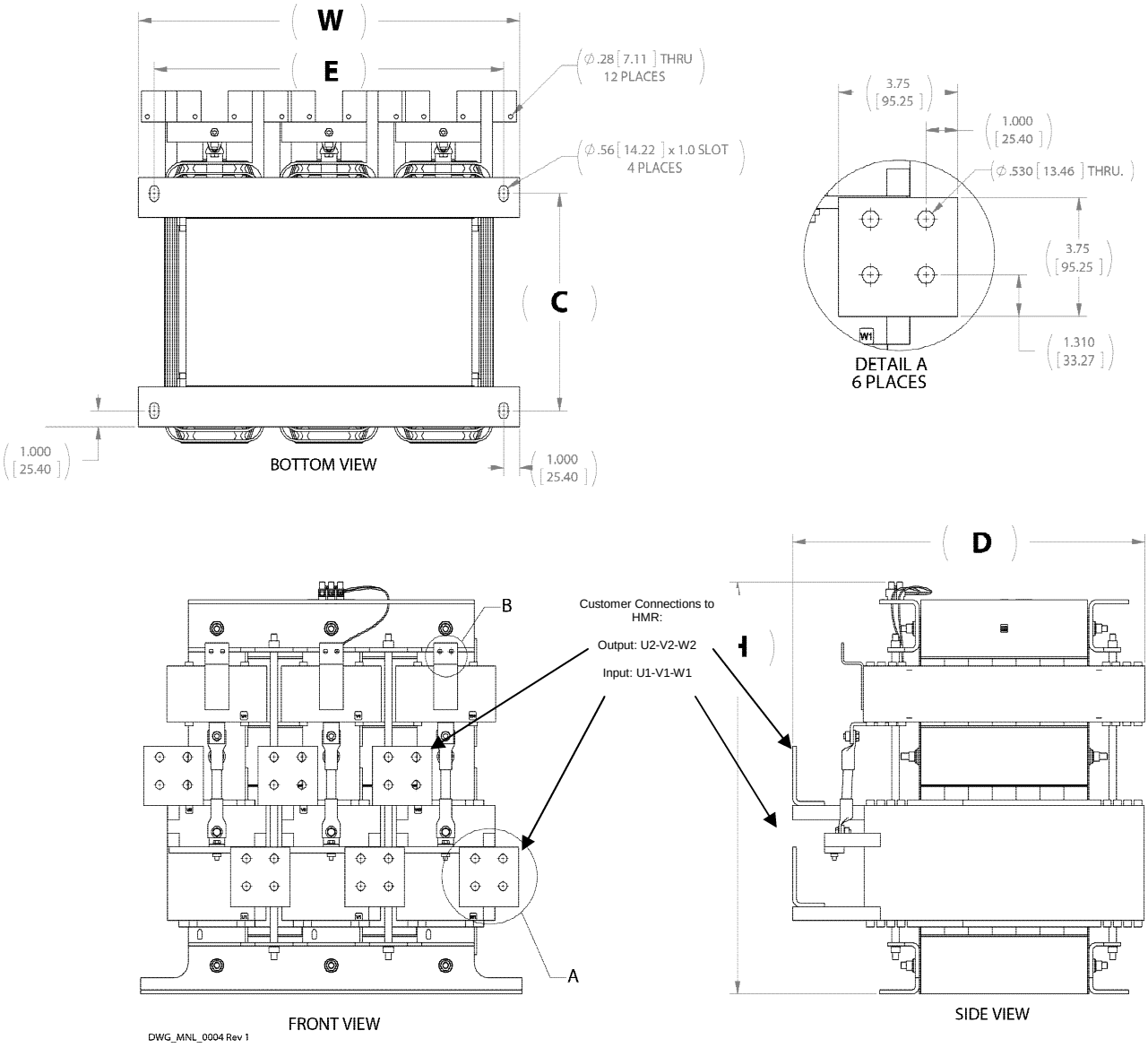


Figure 15

Refer to the MTE website, www.mtecorp.com, for Detailed Specifications.

AP HMR MOUNTING & TERMINAL LOCATIONS

AP HMR 482 – 786 Amp (600V)

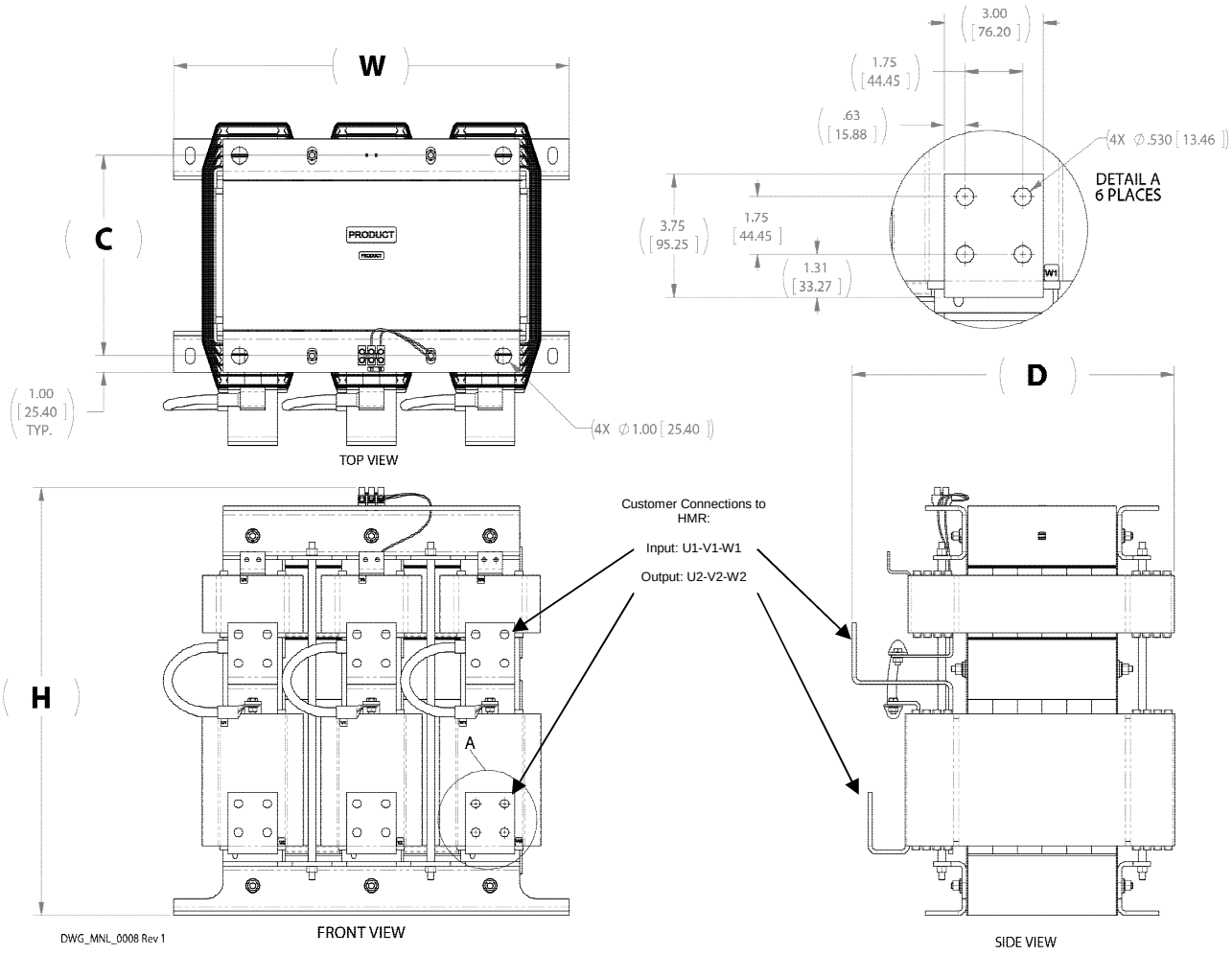


Figure 16

Refer to the MTE website, www.mtecorp.com, for Detailed Specifications.

CAP-ASSEMBLY MOUNTING & TERMINAL LOCATIONS

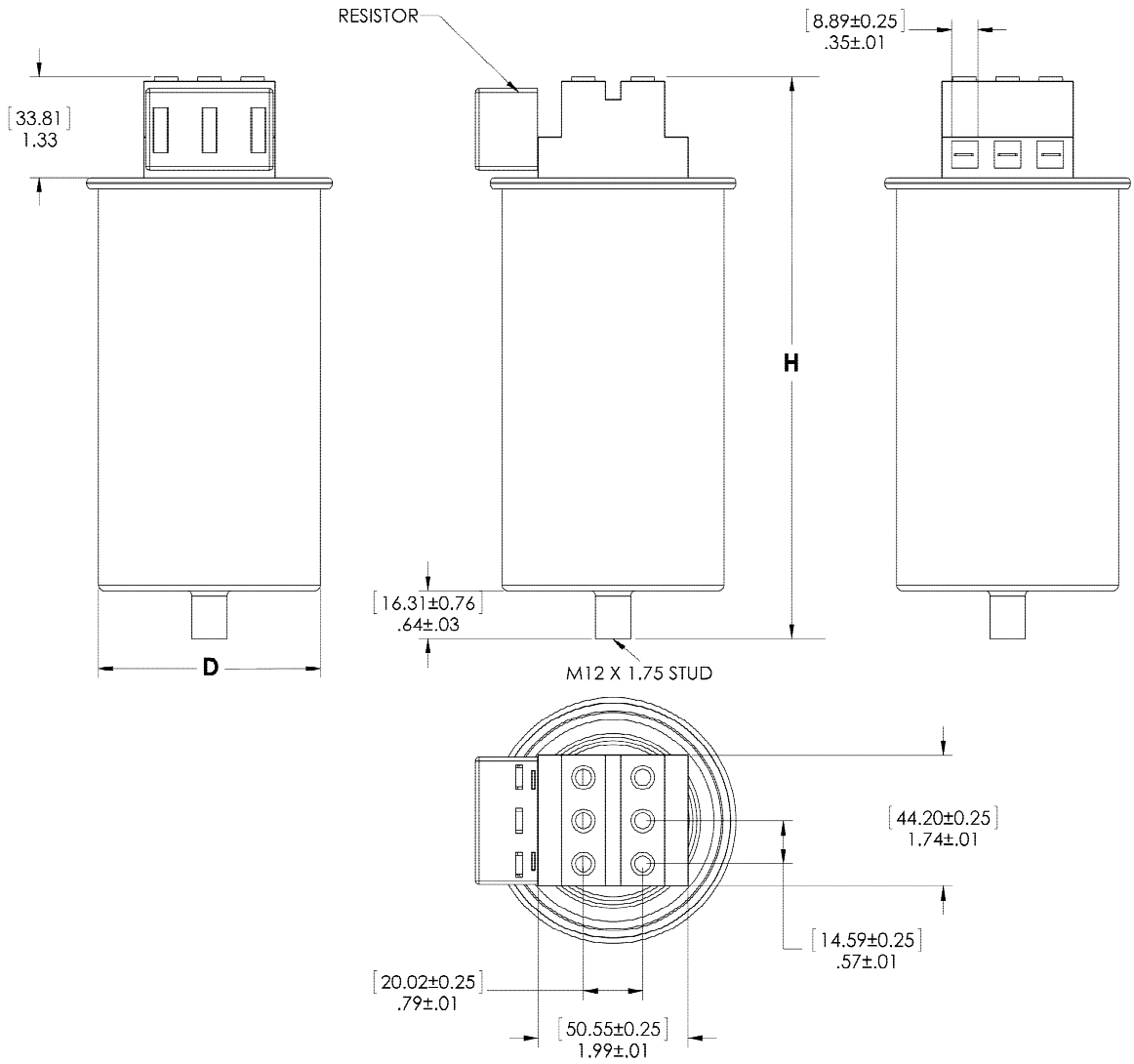


Figure 20 1 – Three Phase Capacitor

Note: Height of capacitor will vary depending on the size of the filter.

Refer to the MTE website, www.mtecorp.com, for Detailed Specifications.

CAP-ASSEMBLY MOUNTING & TERMINAL LOCATIONS

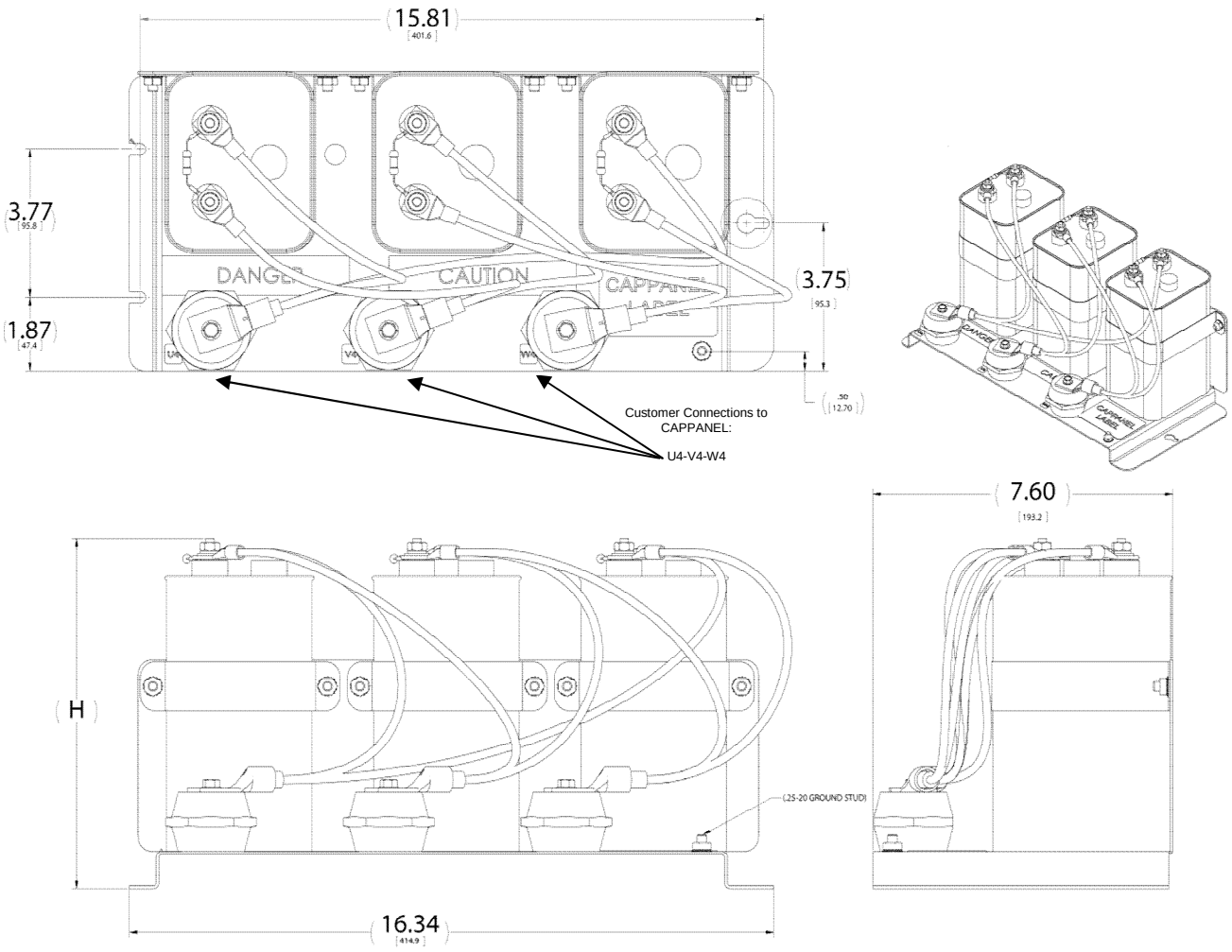


Figure 21 3 – High Current Capacitor Panel

Note: Height of capacitors will vary depending on the size of the filter.

Refer to the MTE website, www.mtecorp.com, for Detailed Specifications.

ENCLOSED UNIT INTERNAL DETAILS

CAB-12AP

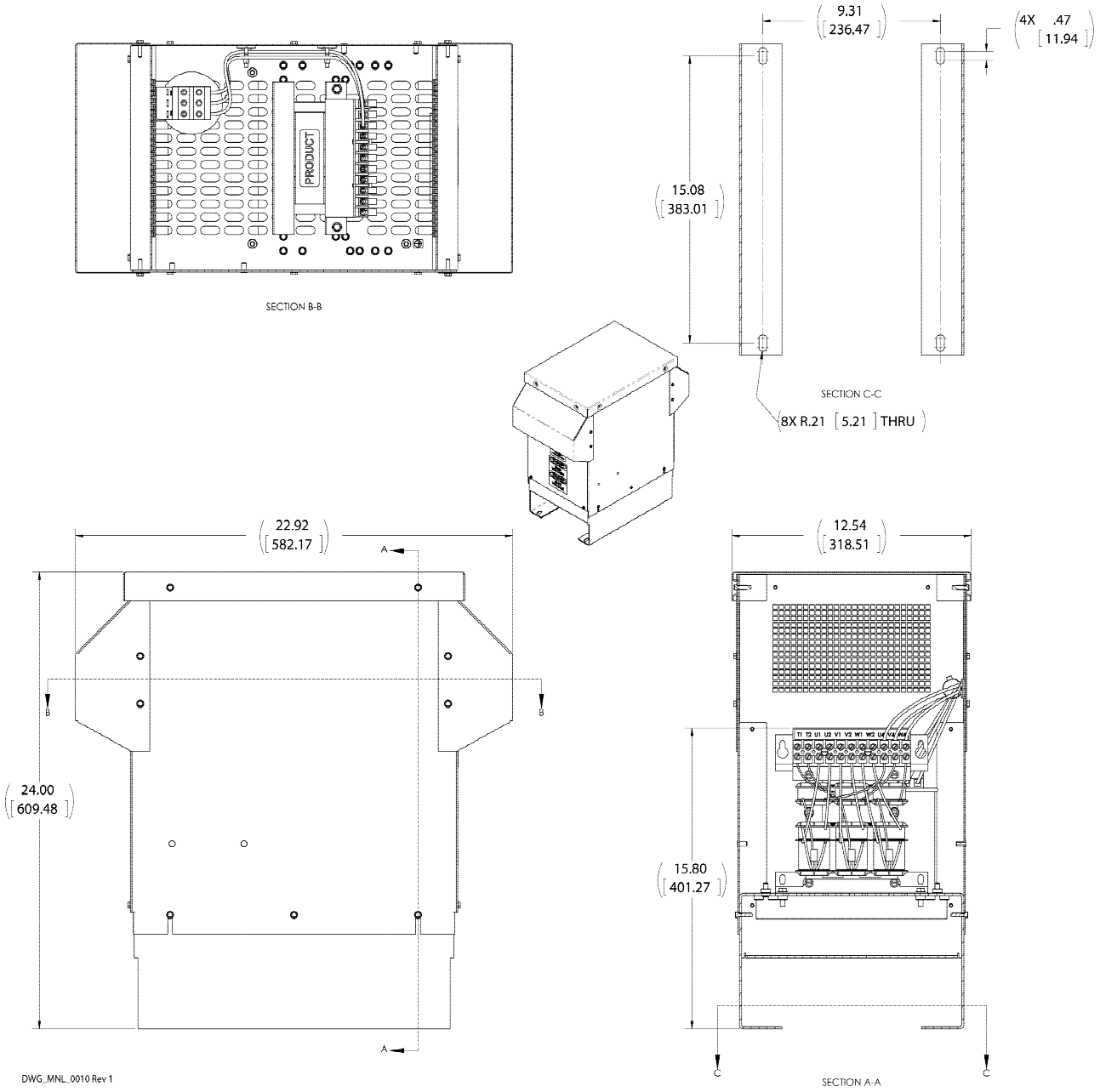


Figure 30

Refer to the MTE website, www.mtecorp.com, for Detailed Specifications.

ENCLOSED UNIT INTERNAL DETAILS

CAB-17AP

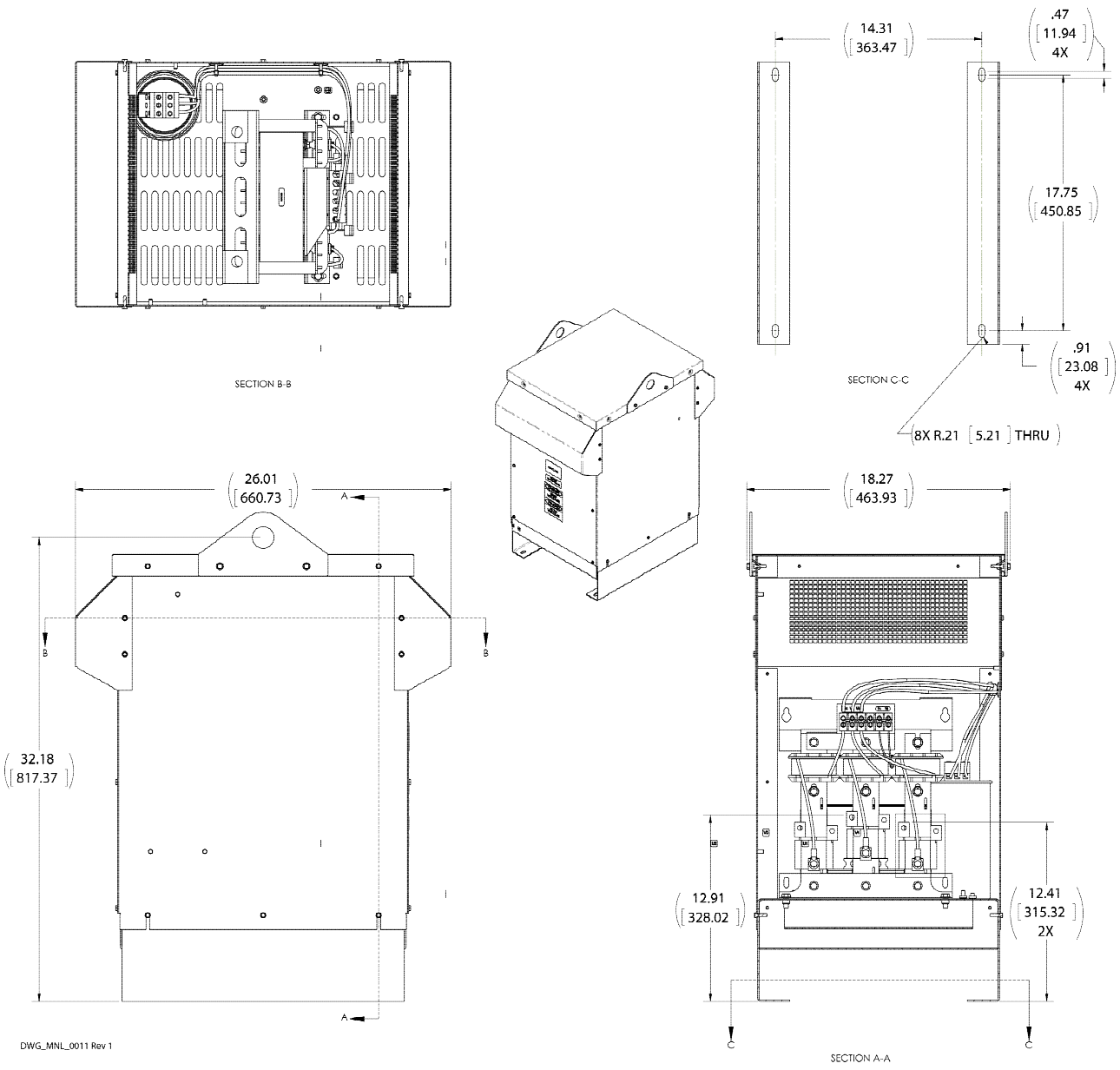


Figure 31

Refer to the MTE website, www.mtecorp.com, for Detailed Specifications.

ENCLOSED UNIT INTERNAL DETAILS

CAB-26AP

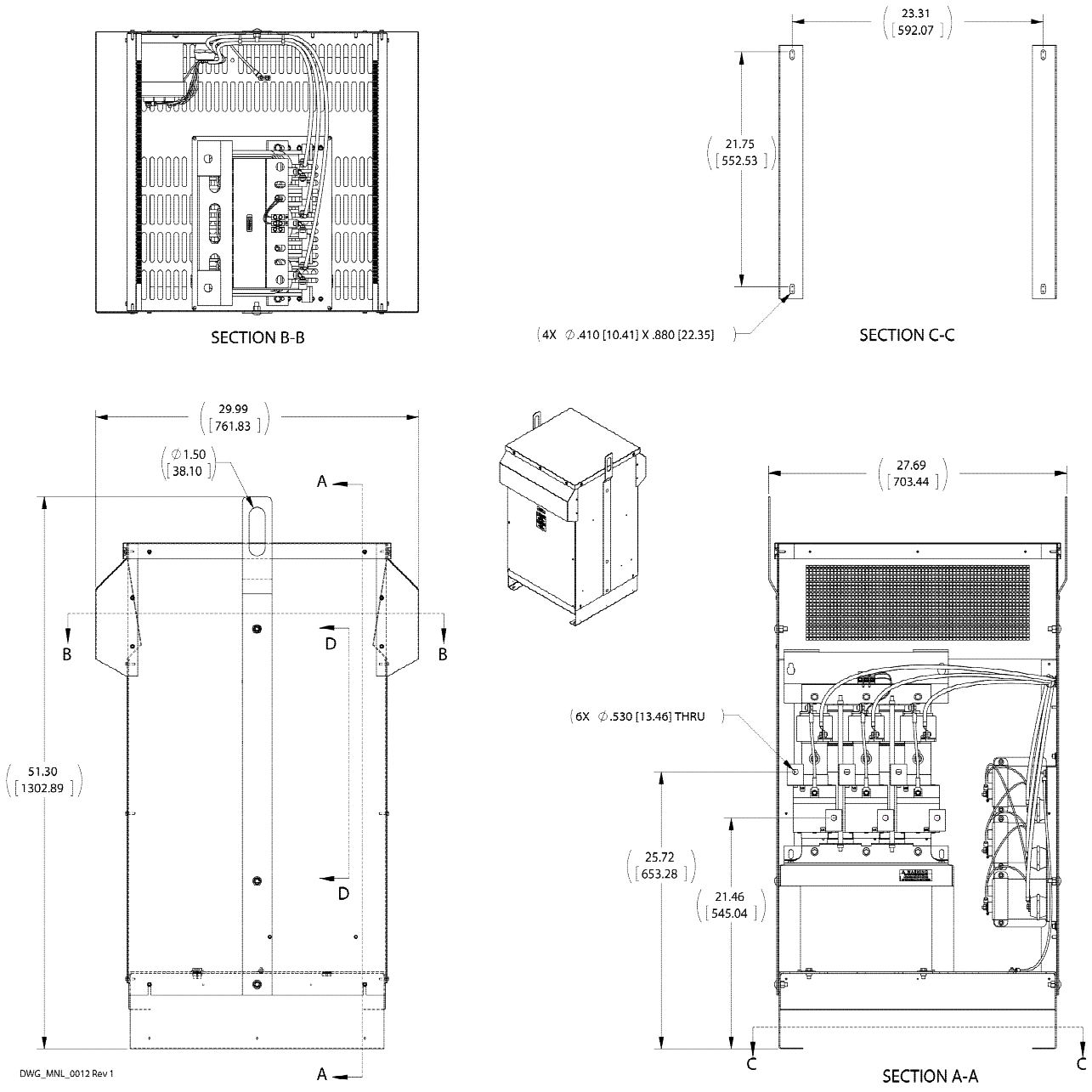


Figure 32

Refer to the MTE website, www.mtecorp.com, for Detailed Specifications.

ENCLOSED UNIT INTERNAL DETAILS

CAB-26APD

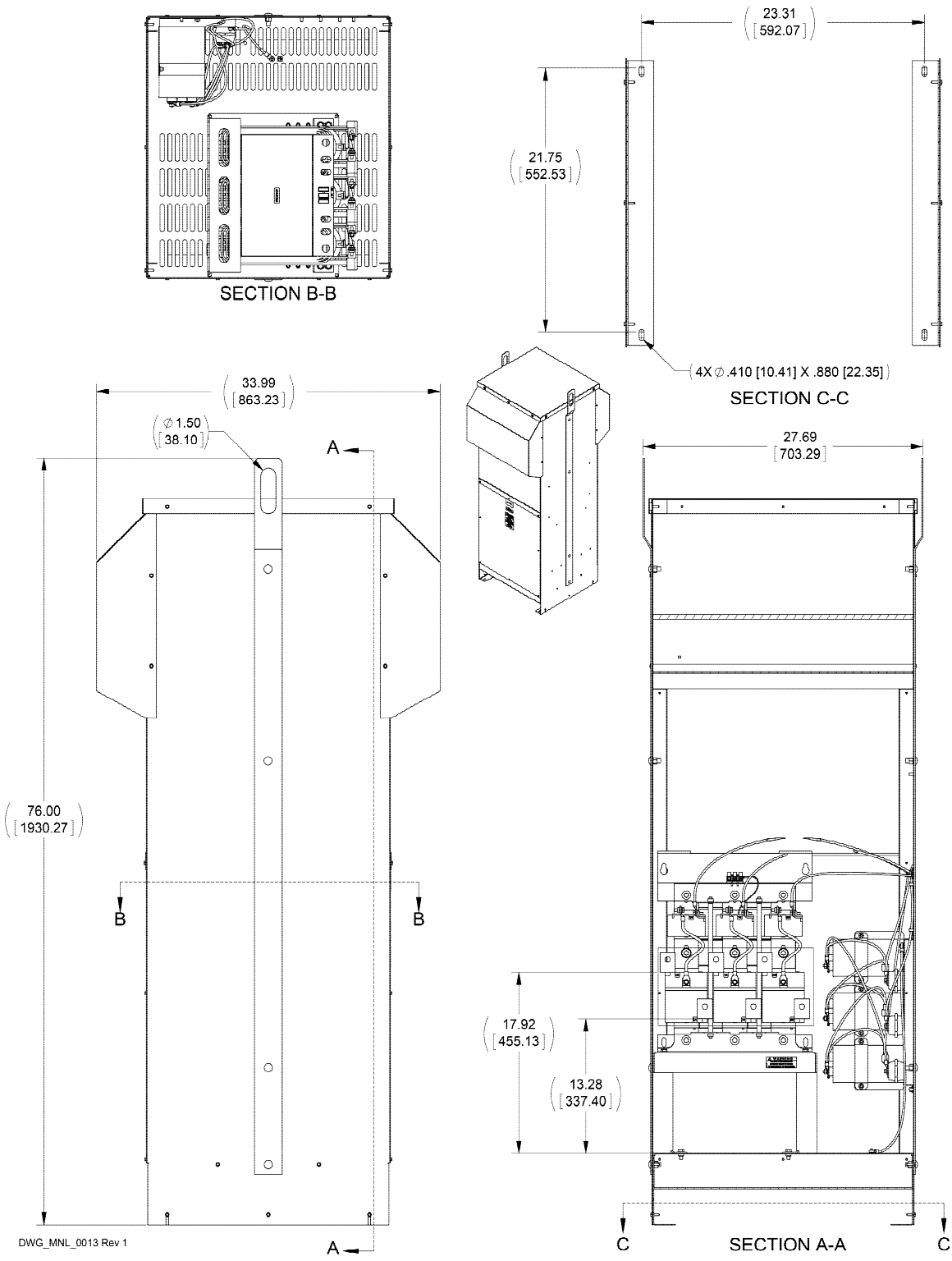


Figure 33

Refer to the MTE website, www.mtecorp.com, for Detailed Specifications.

ENCLOSED UNIT INTERNAL DETAILS

CAB-42AP

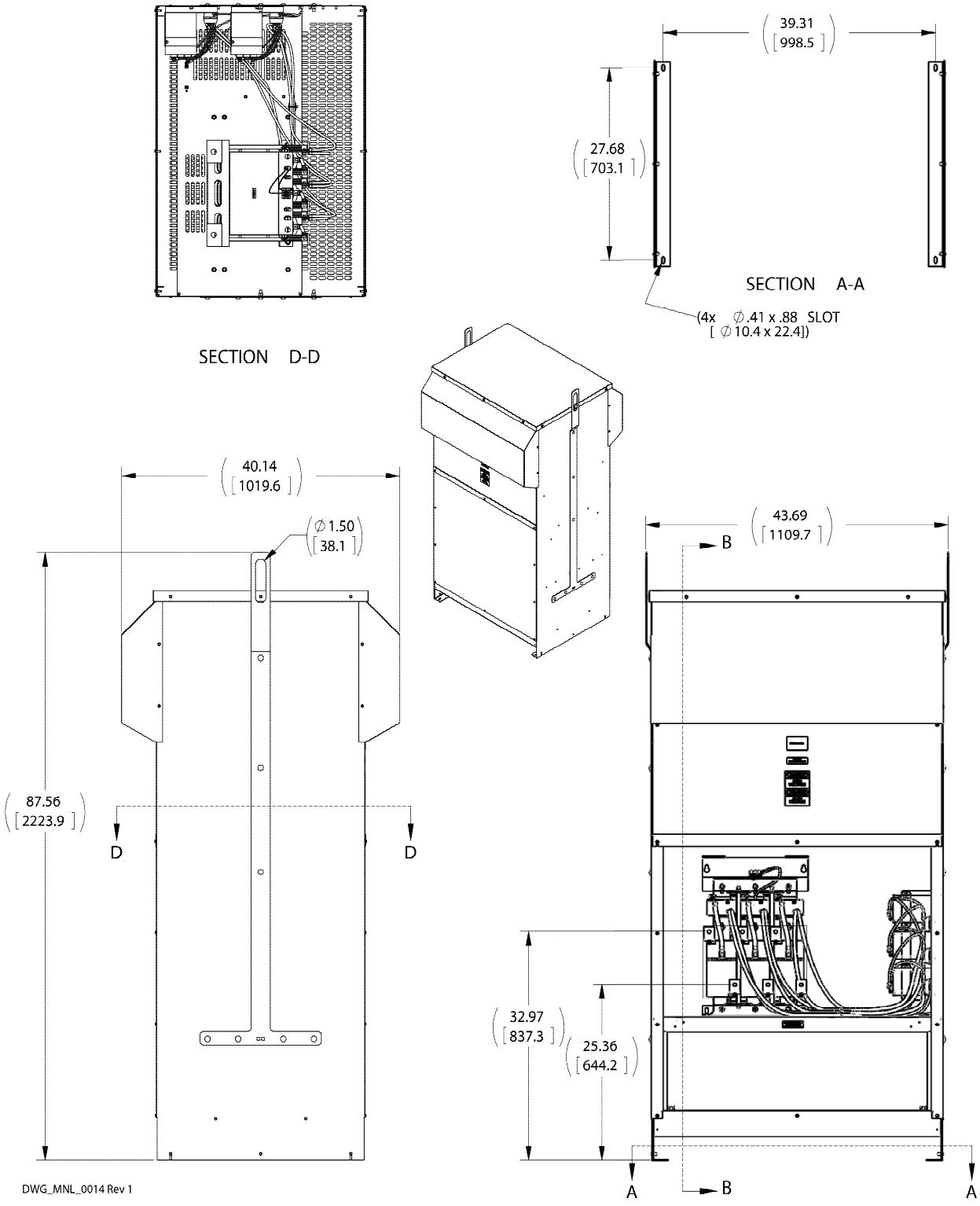


Figure 34

Refer to the MTE website, www.mtecorp.com, for Detailed Specifications.

ENCLOSED UNIT INTERNAL DETAILS

CAB-48AP

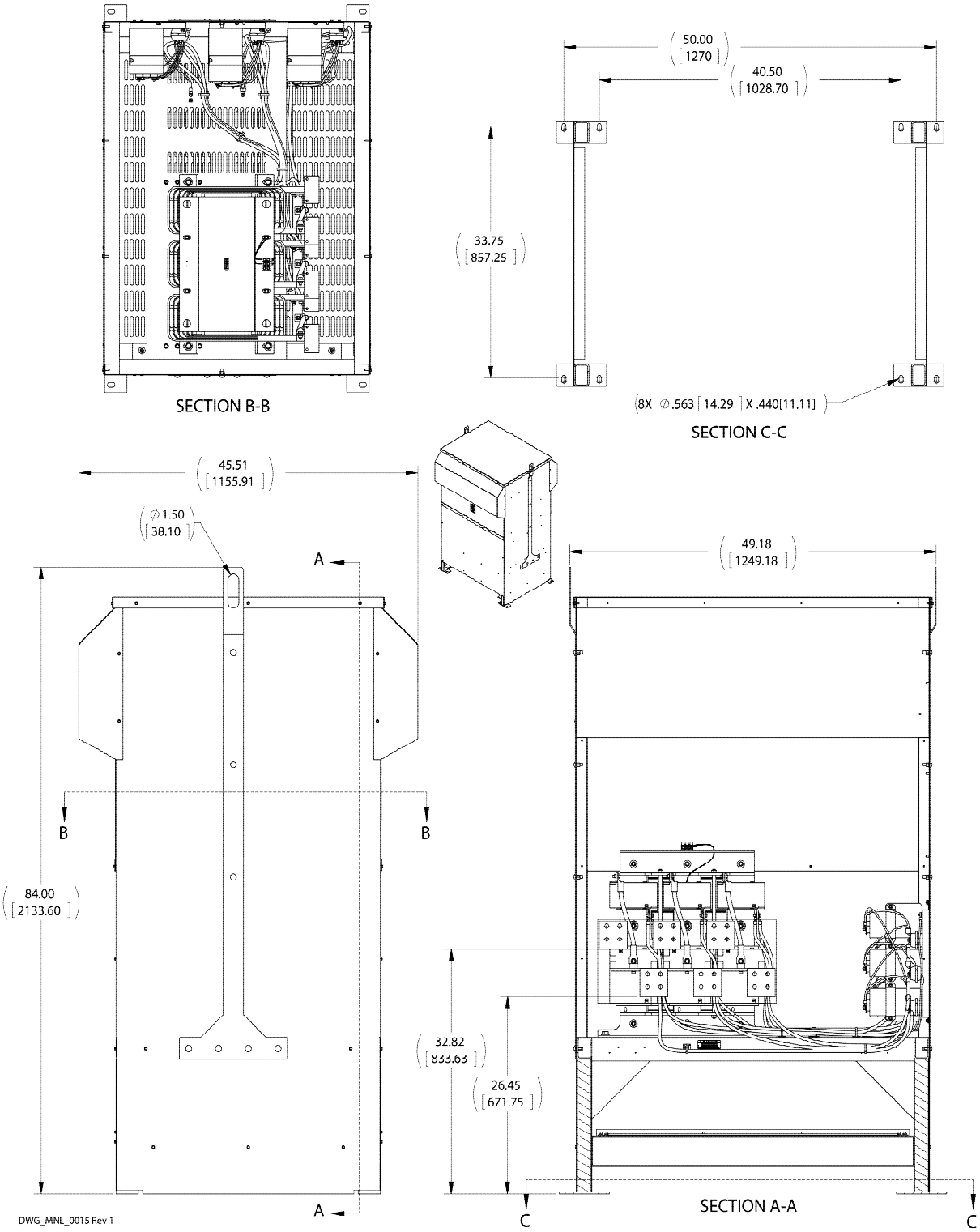
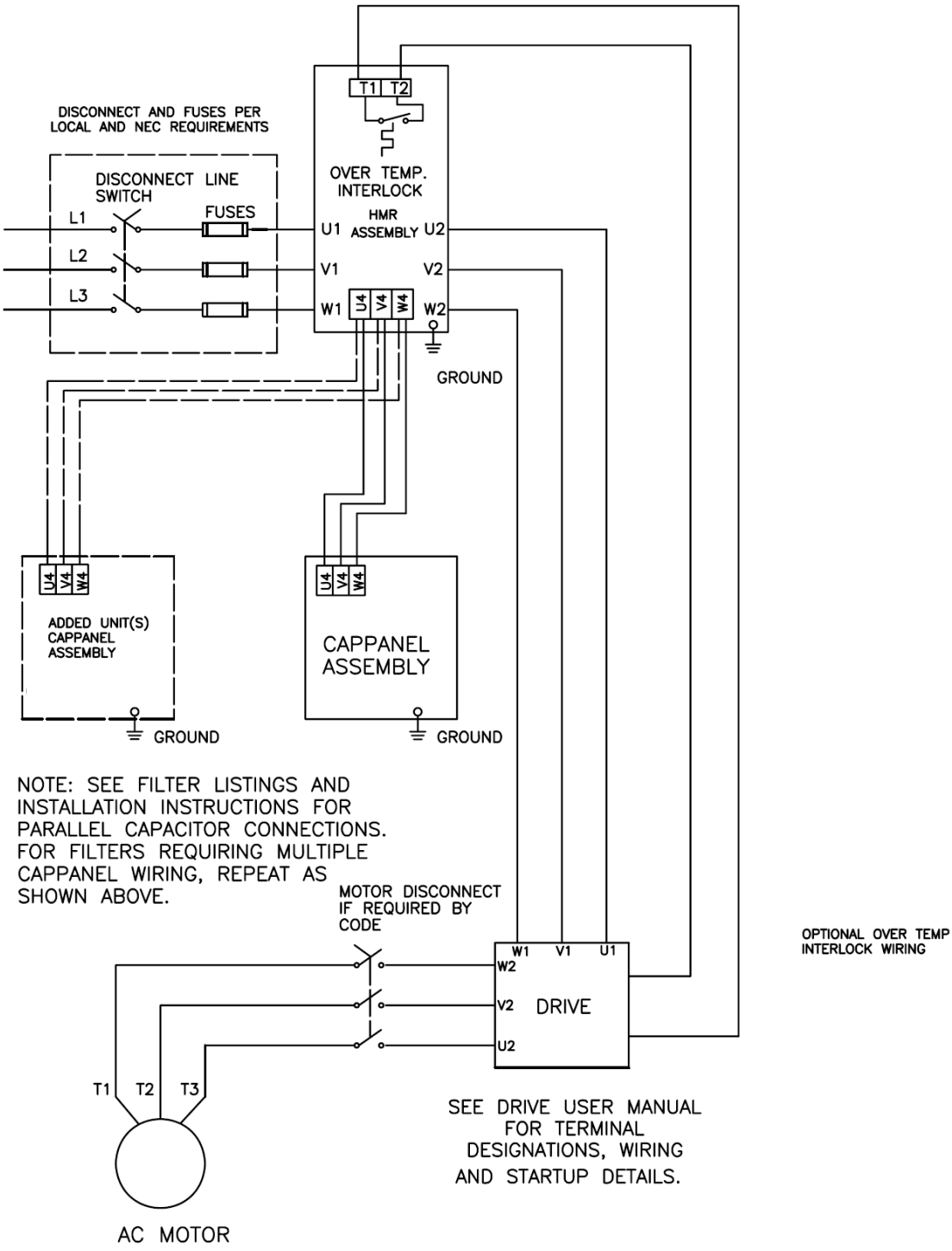


Figure 35

Refer to the MTE website, www.mtecorp.com, for Detailed Specifications.

Open Panel Unit Interconnection Diagram

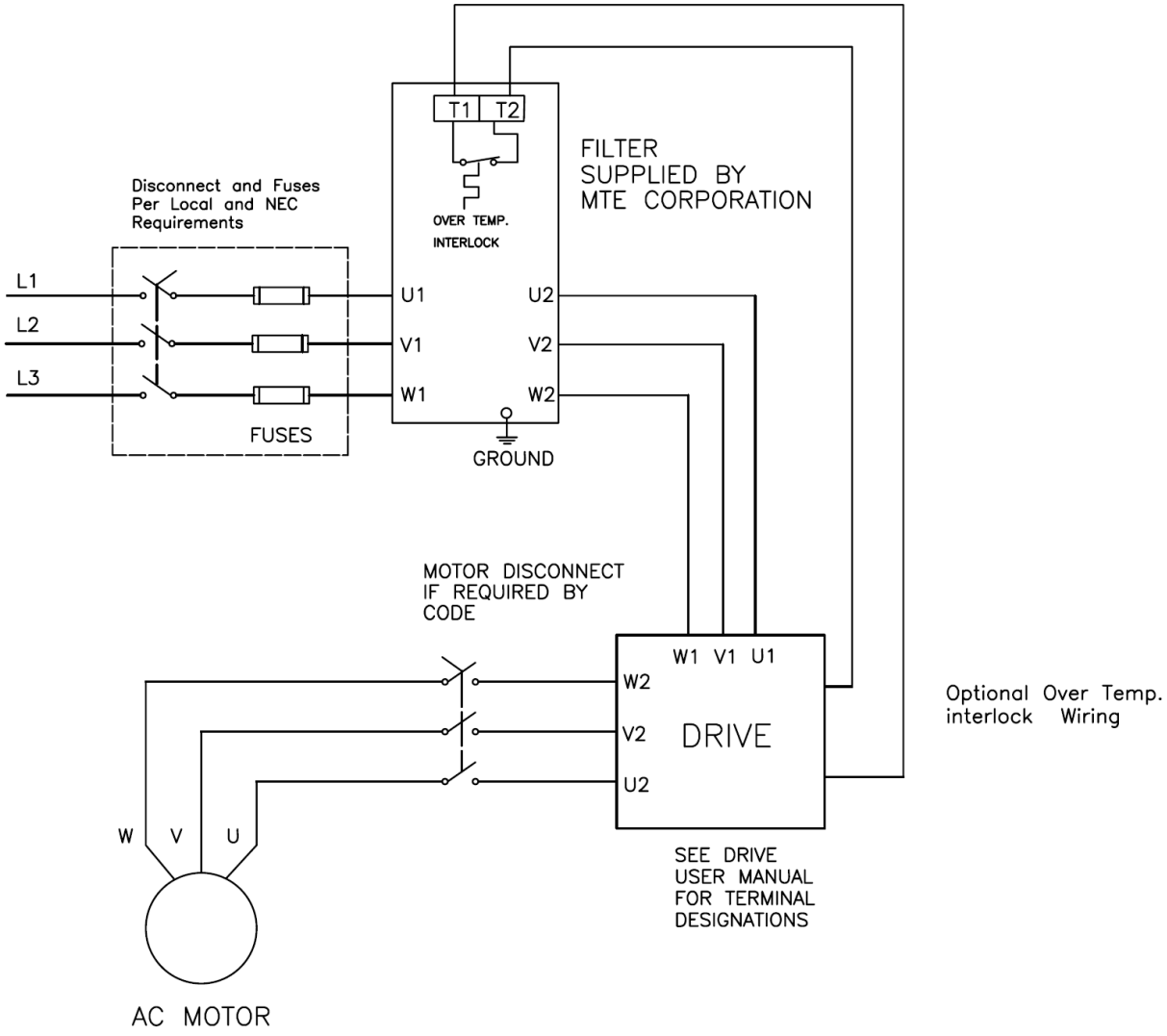
Figure 40



Enclosed Unit Interconnection Diagram

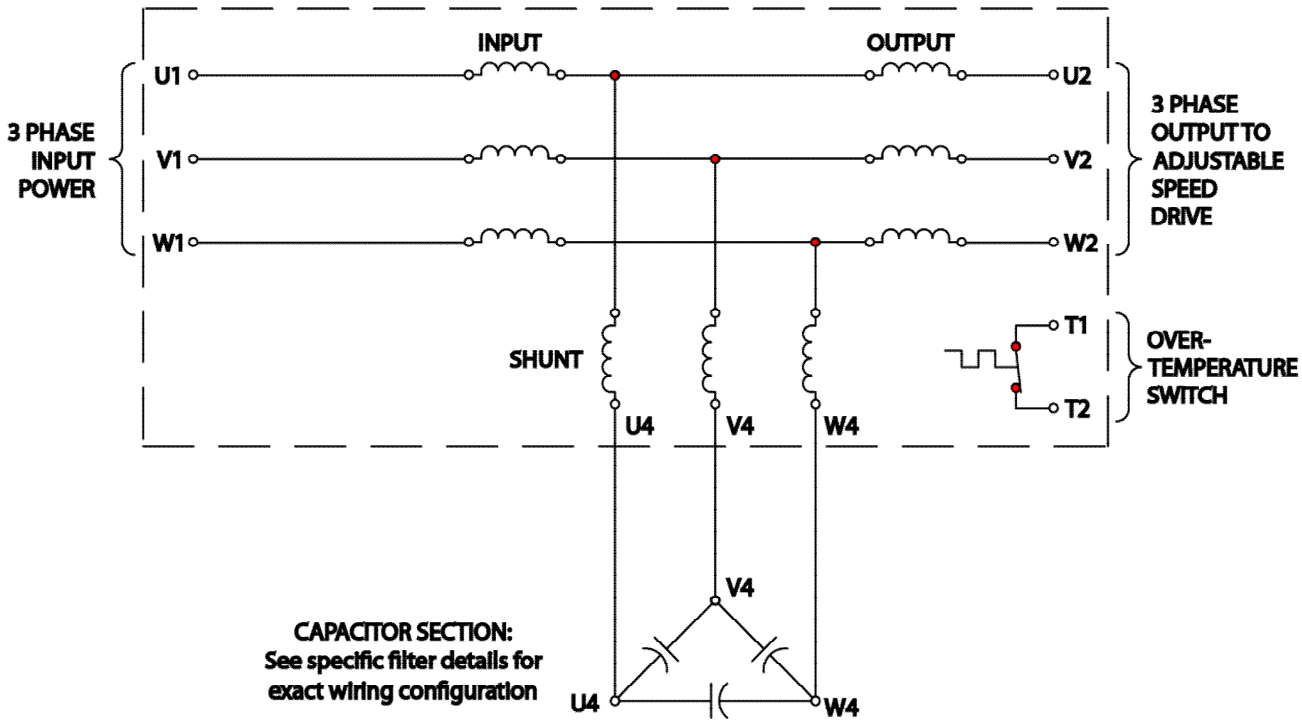
Figure 41

Matrix AP Harmonic Filter



Matrix AP Basic Schematic Diagram

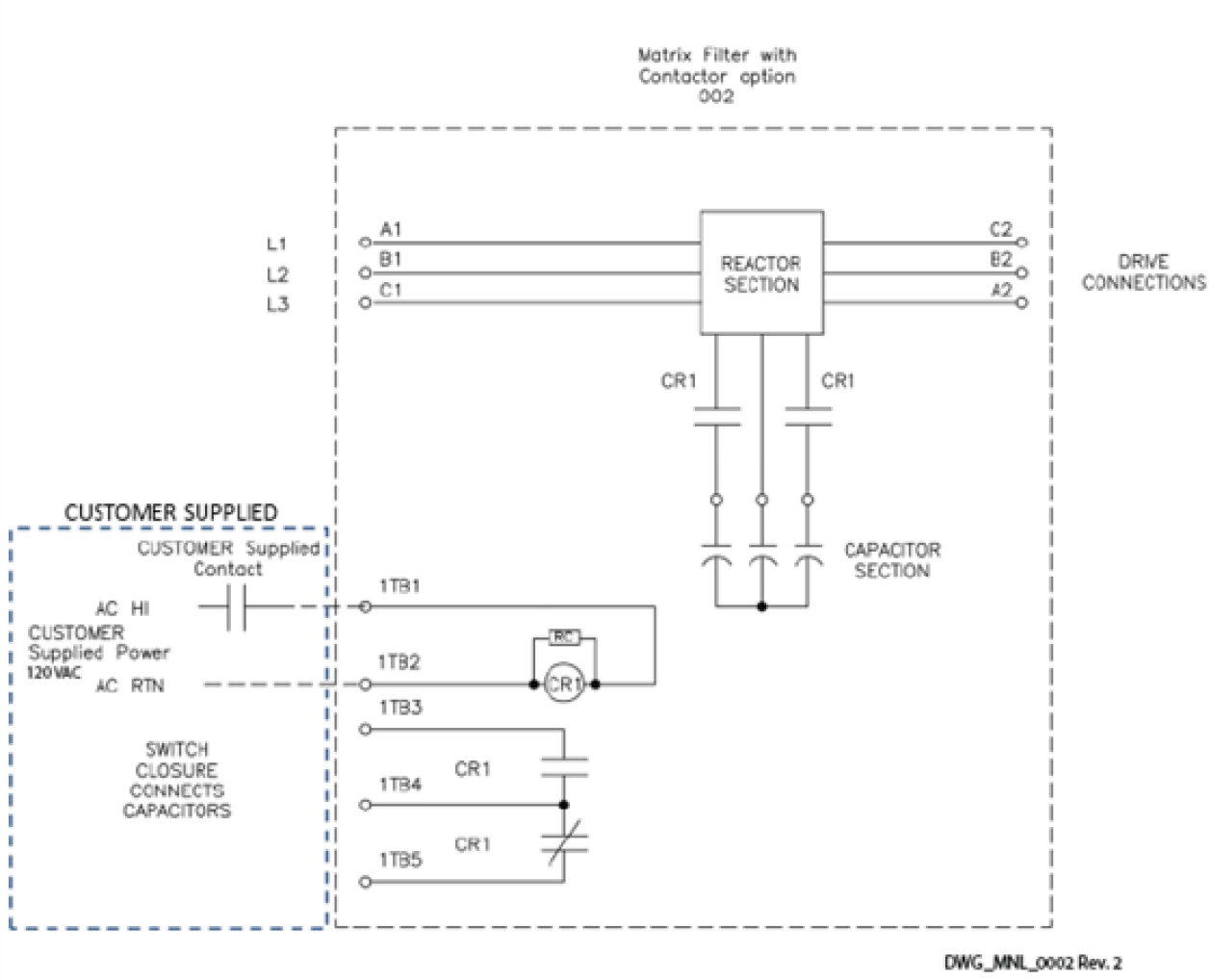
Figure 42



Contactor Options

Option -002
Capacitor Contactor

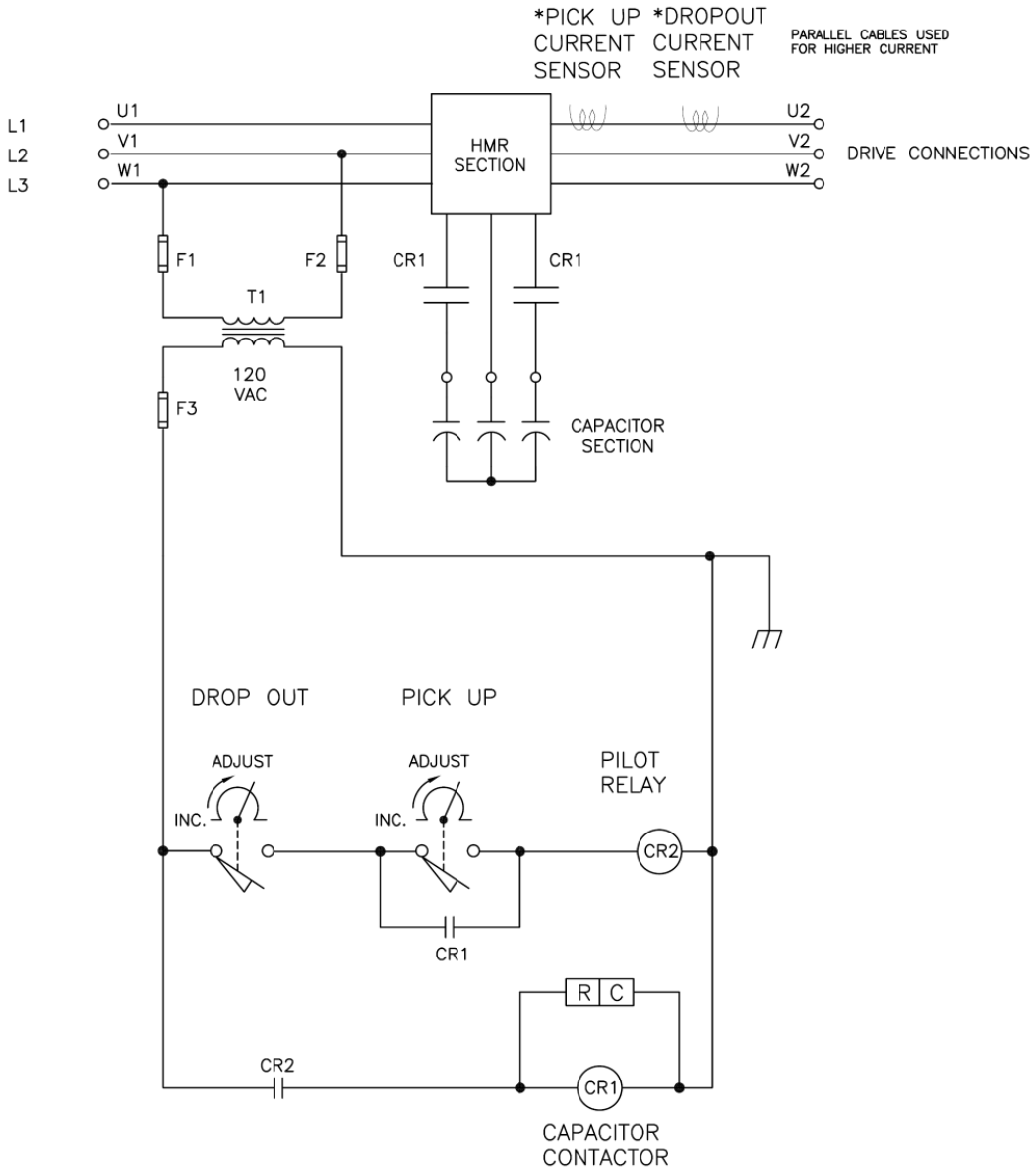
This option provides a contactor to disconnect the filter capacitor bank when the drive is not running. The contactor is supplied with NO/NC auxiliary contacts. The contactor coil and auxiliary contacts are wired to a customer terminal block. See page 61 for contactor coil switching characteristics. This option is provided pre-wired complete for enclosed filters and as loose parts for open panel filters.



The above contactor option diagram is provided to help understand the circuit function and does not reflect actual circuit wiring.

Option -009
Capacitor Contactor with adjustable pick up and drop out

This option provides a contactor to disconnect the filter capacitor bank based on the motor load current. Two current operated switches provide independent adjustment of the pick-up and drop current levels. The switches are preset at the factory for pick up at 35% and drop out at 20% of the filter output current rating. The switches are each field adjustable over a 0 – 100% current range. This option is only available for enclosed filters.

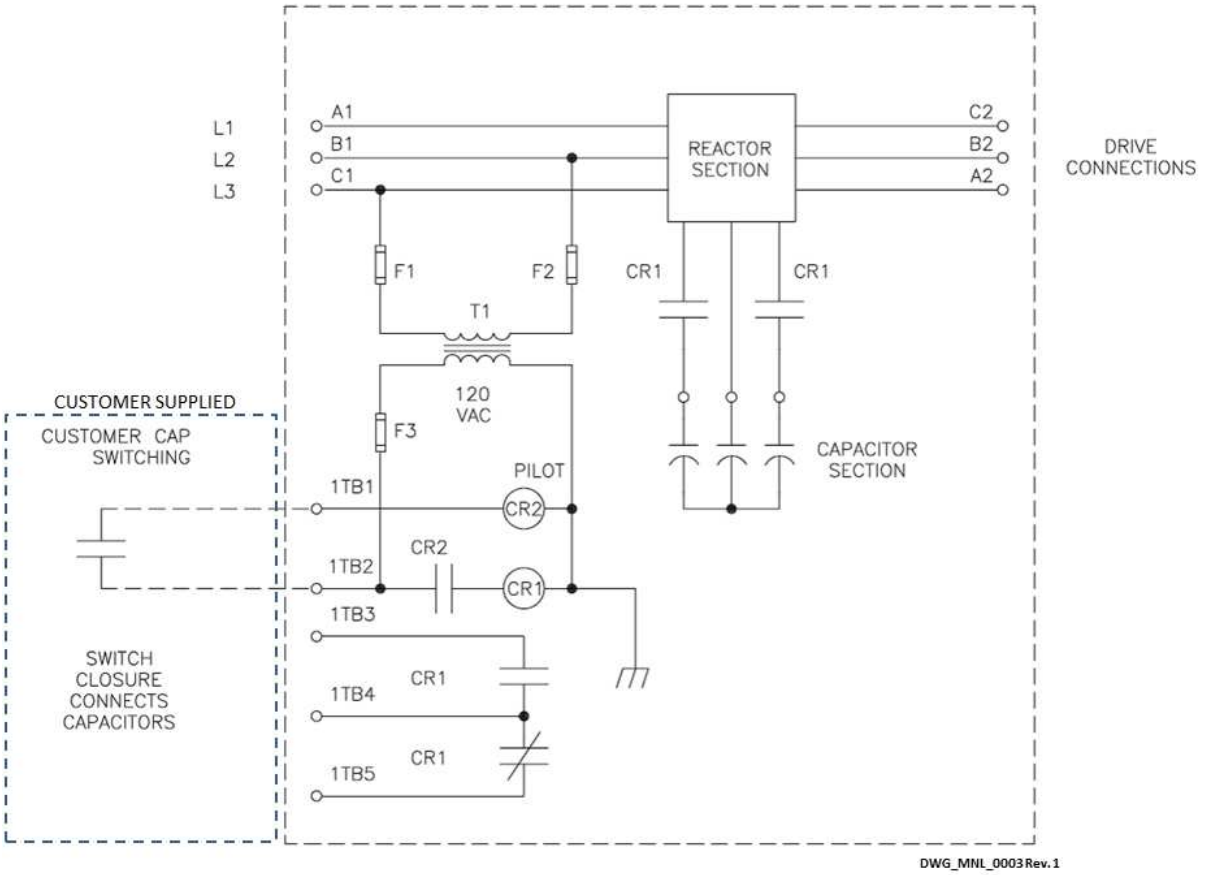


The above contactor option diagram is provided to help understand the circuit function and does not reflect actual circuit wiring.

Option -012

Capacitor contactor with control transformer

This option provides a control transformer to power the capacitor contactor. The contractor is provided with NO/NC auxiliary contacts. For filter ratings 165 amps and above a pilot relay is also provided to limit inrush current below 0.60 amps. Connections are wired to a customer terminal block. This option is only available for enclosed filters.



The above contactor option diagram is provided to help understand the circuit function and does not reflect actual circuit wiring.

Contactor coil switching currents

Table 50

Options 002

The following table indicates the 120 VAC 50/60 Hz current required to switch and hold the various size contactors used in Matrix Filter capacitor switching and bypass options. This data is provided to select the proper switch rating to remotely control the contactor and is consistent for the 400V, 480V, and 600V units.

Contactor Currents for 120 VAC 50/60 Hz coils.

Matrix filter current Rating AMPS	Capacitor Contactor Option 002 AMPS	
	INRUSH	***SEALED***
6	0.341	0.054
8	0.341	0.054
11	0.341	0.054
14	0.341	0.054
21	0.341	0.054
27	0.341	0.054
34	0.341	0.054
44	0.341	0.054
52	0.341	0.054
66	0.341	0.054
83	0.341	0.054
103	0.341	0.054
128	0.922	0.064
165	1.70	0.304
208	1.70	0.304
240	2.00	0.42
320	1.41	0.025
403	1.41	0.025
482	2.08	0.036
636	2.08	0.036
786	3.75	0.036
850	3.75	0.036
1000	3.75	0.036
1200	3.75	0.036