

MERSEN
Expertise, our source of energy

FUSE CONTROL™ PROGRAM

YOUR GUIDE FOR HOW TO
IMPROVE WORKPLACE SAFETY,
REDUCE OPERATING COSTS, AND
ACHIEVE CODE COMPLIANCE





GET CONTROL WITH MERSEN'S FUSE CONTROL™ PROGRAM

Mersen's Fuse Control program is a powerful combination of circuit protection products and services designed to help you get control of your inventory, operating costs, code compliance and workplace safety.

Developed by Mersen and refined through extensive field research, Fuse Control is a simple program that packs a lot of muscle. It will give you the edge you need to mitigate arc flash hazards, achieve code compliance, eliminate obsolete fuse categories, reduce inventory by 25% or more and offer the highest grade overcurrent protection available. Discover Fuse Control and seize the benefits of fuse selection, training and consolidation to increase operating efficiencies and enhance workplace safety.

HOW CAN ONE PROGRAM DELIVER SO MANY BENEFITS?

It's easy! Let the fuses do the work. The key lies in consolidating your current inventory and installed overcurrent protective devices to one fuse line - Mersen's innovative Amp-Trap 2000® fuse family.

Amp-Trap 2000 fuses out-perform the traditional fuse. Opening in less than one-quarter cycle at fault currents up to 300kA, Amp-Trap 2000 fuses minimize the let-through currents and energies that flow downstream during faults. Prevent misapplications, mitigate arc flash hazard potential, minimize downtime that can diminish productivity and profit, and provide the best overcurrent protection available in the industry.

The Amp-Trap 2000 family includes the most common UL fuses used today: L, J, RK1, and CC. While being dimensionally interchangeable with common fuse links, all fuse classes are designed with time-delay characteristics to handle a variety of applications from service entrance to small motor protection. Time-delay (dual-element) fuses can withstand high inrush currents of motors and transformers eliminating nuisance openings. Time-delay also simplifies selection and permits the use of smaller ampere ratings, providing better protection in case of overloads. When sized properly, Type 2 protection and easy 2:1 selectivity are additional safeguards included with Amp-Trap 2000 fuses.

FUSE CONTROL BENEFITS A VARIETY OF INDUSTRIES



Food & Bottling



Metal Fabrication



Oil & Gas



Waste Water



1. Improved workplace safety...by reducing arc flash hazards

The explosive energies reached during an arc flash – intense heat, thermoacoustic shock wave, molten metal – can cause severe, often fatal, injuries to workers even several feet away. The fuses we recommend for reducing arc flash energies are UL Listed branch circuit fuses with the highest degree of current limitation – Mersen Amp-Trap 2000 fuses.

Amp-Trap 2000 fuses limit the fault current before it reaches its maximum value and clear the fault in less than ½ cycle, enabling the fuses to:

- (a) Greatly reduce the total energy delivered to an arcing fault
- (b) Limit to very low values the thermal and mechanical stresses created in equipment by the fault current
- (c) Easily coordinate overcurrent protection systems for both overloads and short circuits

Because this energy reduction lowers the amount of heat generated, the use of these fuses typically minimizes the level of personal protective equipment (PPE) required, allowing personnel to work more efficiently, and most importantly, safer.

2. Streamlined inventory gives greater availability of fuse spares with fewer SKUs

Amp-Trap 2000 fuses have the ability to replace multiple SKUs, reducing your overall inventory by 25% or more. The most common fuses found in today's facilities are the UL Class H, K and RK5. The UL Class H, K and RK5 fuses are dimensionally interchangeable with the Amp-Trap 2000 Class RK1, making them easy to replace with a single class. The Amp-Trap 2000 Class RK1 provides a higher level of safety and performance than the other classes. A Class RK fuse holder should also be installed to prevent users from mistakenly installing Class H or K fuse in the future.

3. Reduced fault damage means decreased operating costs

In addition to streamlining inventory the Fuse Control program saves you by alleviating product replacement costs with current-limiting Amp-Trap 2000 fuses. If sized properly Type 2 “No Damage” protection can be achieved when installing current-limiting Amp-Trap 2000 fuses, which prevent short circuit currents from destroying your critical equipment. This means that your motor starter, contactor or variable frequency drive will remain in functional condition if a downstream electrical fault were to occur, saving you product replacement costs and installation time. Should an arc fault occur within the electrical equipment, Amp-Trap 2000 fuses will limit arc energy to low enough values so that equipment can typically be repaired and placed back in service.

4. Reduced downtime associated with electrical failures with full selective coordination

Amp-Trap 2000 fuses' convenient 2:1 coordination ratio makes it easy to design a fully coordinated protection system. A selectively coordinated system will localize a fault condition, restricting outages only to the equipment affected. A fully coordinated system will eliminate unnecessary outages, help maintain production and save you time and money. Additionally, Mersen's innovative SmartSpot® open-fuse indicator is available on the Amp-Trap 2000 Class J and Class RK1. SmartSpot uses a combination of advanced materials and a unique, solid-body design, which turns an eye-catching red to help you locate an open fuse quickly and safely. SmartSpot eliminates the guesswork and lets you locate the open fuse faster, helping you avoid even more costly downtime.

5. Better electrical code compliance with better fuse replacement options

Since your fuse spares inventory can affect the level of protection and safety in your facility, it should be considered as part of your electrical safety program. Fuse Control helps you eliminate obsolete fuses that can lead to unsafe fuse replacements. Moving to the superior performance and ratings of Mersen Amp-Trap 2000 fuses helps you in your efforts to reduce the risk of injury to your electrical workers.



Now that you understand the benefits of the Fuse Control program, we can review the three proper steps needed to implement a successful consolidation:

1. Storeroom Audit and Database Analysis
2. Consolidation Report & Plan
3. Implementation

The Fuse Control program will be performed by a Mersen electrical distributor in collaboration with a Mersen Solutions Engineer, making it effortless for you. Each phase contains its own list of action items and deliverables which allow for a smooth and efficient conversion. There is no time pressure; the phases are performed at a pace that works around your schedule.

1 PHASE 1: THE STOREROOM AUDIT & DATABASE ANALYSIS

The main goal of phase one is to audit your storeroom and analyze your inventory database in order to gather the necessary information for an accurate consolidation report.

How to Get Started

The process typically begins with an orientation meeting given by your Mersen sales representative. The goal of the meeting is to inform appropriate personnel within your facility about the benefits of Amp-Trap 2000® and the Fuse Control program.

Since the program targets many facets of the organization, it is important to reach out to all personnel.

The orientation meeting can be an informal or formal process depending on your situation. Mersen is here to serve you and to help make the process as efficient and effective as possible. The orientation meeting will usually be hosted by a Mersen sales representative in conjunction with a distributor of your choice. Mersen Solutions Engineers are available for in-depth training seminars on various safety and circuit protection topics.

Who Should be at the Table?

- Plant Manager
- Plant Electricians
- Maintenance Personnel
- Safety Managers / Engineer
- Purchasing Manager
- Inventory Manager
- Electrical / Facility Engineer

To learn more about Fuse Control, contact Mersen:

Phone: 978-465-4853

Email: TechnicalServices.EP@mersen.com

Web: ep.mersen.com





Performing the Audit

Once you and your organization understand the benefits and are ready to proceed we can start the storeroom audit and database analysis process. The process is very simple and will take up little of your time and resources. Also, did we mention it is free! The fuse inventory and audit analysis are provided to you at no cost.

We will need a full record of your fuse inventory. This information may already be available through your software ordering system. The following information will be required:

- **Customer Part Number:** The part numbers you have assigned to identify the fuses in your inventory
- **Stock Location (Bin Number):** The location number associated with the bin or shelving where the fuse is located
- **Manufacturer:** Name of the manufacturer of the fuse
- **Manufacturer's Part Number:** The fuse manufacturer's part number found on the fuse itself
- **Part Number Description:** The description of the product including voltage and ampere rating. Used to help identify the product in case the part number does not match. May also include dimensions and key words such as "Class J" or "time-delay."
- **Quantity on Hand:** The quantity on hand of each particular part number
- **Annual Usage:** The annual quantity consumed for each part number for the last 12 months
- **Min/Max Levels:** The minimum and maximum inventory levels which will be used to drive your ordering system

Note: Consult your sales representative if this inventory information is not readily available for guidance on how to proceed.

Where applicable, it is also important to audit the fuses you have in service. It is one thing to have the proper Amp-Trap 2000 fuses in stock but that still doesn't help you with fuses that are currently installed. If possible you should perform an audit on fuses that are in service and also replace those fuses with Amp-Trap 2000 fuses. This way you will be fully protected and reap the full benefits of the program immediately.

Submitting the Data

Once the audit is complete, the next step is to send the electronic file to your Mersen sales representative. The representative will then work with Mersen applications engineers who will analyze the data using our proprietary Fuse Usage & Storeroom Evaluation software.

Submit Data in Microsoft® Excel

Please submit your inventory data electronically using Microsoft® Excel®. You may download an Inventory Audit Template in Microsoft Excel from our website, ep.mersen.com.



<p>MERSEN 374 Merrimac St. Newburyport, MA 01950 (978) 462-6662</p>		Customer Name: <input type="text"/>		Date: <input type="text"/>					
		City/State: <input type="text"/>							
		Distributor Name: <input type="text"/>							
		City/State: <input type="text"/>							
Item #	Customer Part #	Stock Location (Bin #)	Manufacturer	Mfg Part #	Part Number Description	QOH	Annual Qty	Min	Max
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
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16									
17									
18									
19									
20									



2 PHASE 2: THE CONSOLIDATION REPORT & PLAN

During this phase, a Mersen factory engineer will analyze your data using our proprietary Fuse Usage & Storeroom Evaluation software. This software consolidates the audited inventory list into Mersen Amp-Trap 2000® fuses. The result is a series of valuable reports, which detail the bottom-line benefits of converting to the Fuse Control program and Amp-Trap 2000 fuses.

The Sections of the Report

The Fuse Control Amp-Trap 2000 Consolidation Report is comprised of the following:

- Inventory Consolidation Summary
- Inventory Consolidation Detail
- Class H Fuses Identified in Inventory
- Duplicate Inventory not Upgraded to Amp-Trap 2000
- Follow-up Report

These combined reports will give you a comprehensive view of your potential streamlined inventory and will inform you of how many SKUs you can eliminate as well as what actions you should immediately consider to improve safety in your facility.

Inventory Consolidation Summary Report

The Inventory Consolidation Summary Report (Fig. 1) is a one page document summarizing, for each fuse class, the number of bins you currently have, the number of bins you could have by consolidating to Amp-Trap 2000 fuses, and finally the number of bins you could eliminate. Figure 1 illustrates that for this example the user was able to eliminate 136 bins of inventory reducing the total from 230 bins down to 94 bins. Each Amp-Trap 2000 fuse class is listed in the left-hand column. This will allow you to view the overall breakdown of bins consolidated by each fuse class.

Inventory Consolidation Detail Report

The Consolidation Detail Report (Fig. 2) is a multi-page document which validates how the consolidation summary was derived. It identifies each individual part number and its Amp-Trap 2000 equivalent, along with the end user part number, bin number, annual usage, current inventory, min/max levels and physical inventory. By utilizing annual usage and quantity on hand, we will be able to recommend a stocking quantity suitable for your plant use. It is common to find stocking quantities of two different fuses used for the same application. For example, let's analyze part number A6D15R within Figure 2. We were able to replace four different stocked parts with a single fuse. We were also able to reduce the stocking level by basing the new inventory quantities on the combined annual usage value.

FUSE CONTROL™

Amp-Trap 2000® Inventory Consolidation Summary

Company Name
Analysis # 012515003
Date

Upgrade Category	Existing Number of Bins	Number of Bins with Amp-Trap 2000	Number of Bins Eliminated
A2DR	43	35	15
A4BQ	58	23	20
A6DR	26	12	14
AJT	35	30	15
ATDR	57	5	49
ATGR	11	5	5
Totals:	230	94	136

Fig. 1 Inventory Consolidation Summary Report

FUSE CONTROL™

Amp-Trap 2000® Inventory Consolidation Report

Amp-Trap 2000 Category / Upgrade Fuse / Existing Fuse	Mersen Equivalent	Customer Part Number	Bin Number	Annual Usage	Current Inventory	Minimum Inventory	Maximum Inventory
A2DR							
FR15-15	TR15R	A1000	WB-1-1	12	10	5	20
FR15-20	TR15R	A1000	WB-1-1	8	10	5	20
			Total	20	20	10	40
A4BQ							
FR15-15	TR15R	A1000	WB-1-2	10	5	5	20
FR15-20	TR15R	A1000	WB-1-2	22	20	15	30
			Total	32	25	15	50
A6DR							
FR15-15	TR15R	A1000	WB-1-1	1	5	5	10
TR15-15	TR15R	A1000	WB-1-1	12	20	10	30
LFD-15-15	A6D15R	A2000	WB-1-1	2	5	5	10
WB15-15	QT15R	A1000	WB-1-1	5	2	5	20
			Total	20	32	20	70
A2GR							
TR15R	TR15R	A1000	WB-1-4	30	10	10	30
			Total	30	10	10	30

Fig. 2 Inventory Consolidation Detail Report



Class H Fuses Identification Report

This report identifies and locates Class H fuses in your inventory (Fig. 3). Class H fuses, also known as “renewable fuses,” are not the proper fuse to install in 99% of today’s applications. The 2005 National Electric Code Article 240.60(D) states that Class H renewable fuses are not permitted in new installations. Mersen recommends immediately eliminating these fuses from your inventory. Class H fuses have significantly lower interrupting ratings and performance capabilities than Class RK1 fuses and can be harmful to your personnel and equipment. The fuses identified in this report are also included in the consolidation details report.

Bin Number	Customer Part #	Fuse Part #	Usage	Current Inventory	Mersen Equipment (Class)	Mersen Upgrade
WB-5-12	A1000	W0A-00	20	30	GTW (K)	A2000
WB-6-1	A1000	W0A-15	8	2	GTW (K)	A2000

Fig. 3 Class H Fuses Identified in Inventory Report

Duplicate Inventory Report

The Duplicate Inventory Report (Fig. 4) detects equivalent part numbers that are physically stocked in separate bin locations. By locating these part numbers, we can identify how many bins you can eliminate by consolidating like part numbers only. Using Fig. 4, let’s analyze Mersen part number GGC5. In this example, part number GGC5 is stocked in two separate bin locations. The primary focus of the duplicate inventory report is on those products that will not be upgraded to Amp-Trap 2000® fuses such as glass, semiconductor and special purpose fuses.

Mersen Part Number	Customer Part #	Fuse Part #	Bin Number	Inventory	Mersen Inventory	Current Inventory	Actual Inventory
GGC5	200-000	A1200	WB-0-10	5	10	7	10
	200-100	A2000	WB-0-20	20	40	20	20
GGC1	200-000	A1200	WB-0-8	10	20	10	10
	200-100	A2000	WB-0-08	10	20	10	20
T-8-50	200-000	A1000	WB-14-3	3	0	3	3
	200-100	A1000	WB-14-02	4	12	4	4

Fig. 4 Duplicate Inventory not Upgraded to Amp-Trap 2000 Report

Additional Information / Follow-Up Report

The Follow-Up Report (Fig. 5) consists of a list of part numbers with missing or invalid information, such as incorrect or incomplete part numbers or descriptions. This report is used to clear up any missing or incorrect information from the audit process. Mersen’s reps and distributors will work with you to correctly identify these fuses.

After the Follow-Up Report has been resolved, we will update the Fuse Control report one final time making sure all information is up to date and accurate. At this time our team will work with you to provide a customized proposal to proceed with the consolidation of fuse inventory.

Bin Number	Part Number	Fuse Part Number	Ferraz Shawmut Equivalent	Comments	Write Corrected Part Number Here
		GPC-03		See Comments	No Ferraz Shawmut Cross
		SLCAX		See Comments	No Ferraz Shawmut Cross
		GPC-1		See Comments	No Ferraz Shawmut Cross

Fig. 5 Follow-up Report



3 PHASE 3: IMPLEMENTATION

Once the Fuse Control report has been presented and the benefits of Amp-Trap 2000® fuses are apparent, you are ready for the implementation phase. Your Mersen sales representative will quote your conversion order based on your annual usage and min/max levels created by the Fuse Control consolidation report.

Update Database

Make sure that your inventory and ordering software is updated with the new part numbers and bin locations. The conversion will not work if your system is not prevented from re-ordering the obsolete inventory. Customer part numbers, bin locations, min/max levels, and part descriptions should all be updated. Mersen can provide you with an electronic list of part numbers and descriptions to upload into your software ordering system. Database updates are critical to the success and longevity of a conversion.

Ordering and Delivery

From Mersen's quote, you can adjust quantity levels based on your company's needs. Another benefit of Amp-Trap 2000 fuses is that they are always readily available at Mersen's distribution warehouse, meaning if you do not have inventory we can deliver the fuse 97% of the time when requested. Also check with your local Mersen distributor for their stocking policy and availability. After the purchase order is placed, Mersen will deliver the quoted order according to your requested date. Look for the distinctive Amp-Trap 2000 orange and blue product labels.

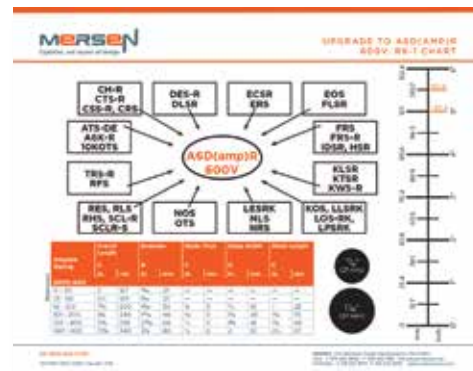
Obsolete Inventory

Before we can complete the integration of your new Amp-Trap 2000 inventory, we recommend disposing of any old, obsolete product which may be hazardous to your people and equipment. Phasing in new inventory is not recommended.

Recycling programs are available from participating Mersen representatives and distributors. Please consult your representative or distributor if you have questions.

Bin Labels

After the storeroom has been cleansed of dead inventory, the next step is to re-label your fuse bins. Work with Mersen to create bin labels that will allow you to easily identify the fuse and its location. A free customizable Microsoft® Word bin label template is available on Mersen's website (ep-us.mersen.com/solutions/fuse-control)



Example of the Consolidation Charts

Consolidation Charts

Mersen will also provide cross reference documents and charts to be posted in the fuse storeroom. We make it easy for maintenance electricians and personnel to select the proper Amp-Trap 2000 fuse in cases where there is a need to replace an old fuse that was still in service. Six consolidation charts, one for each major fuse class, are available (see sample chart above).

Training

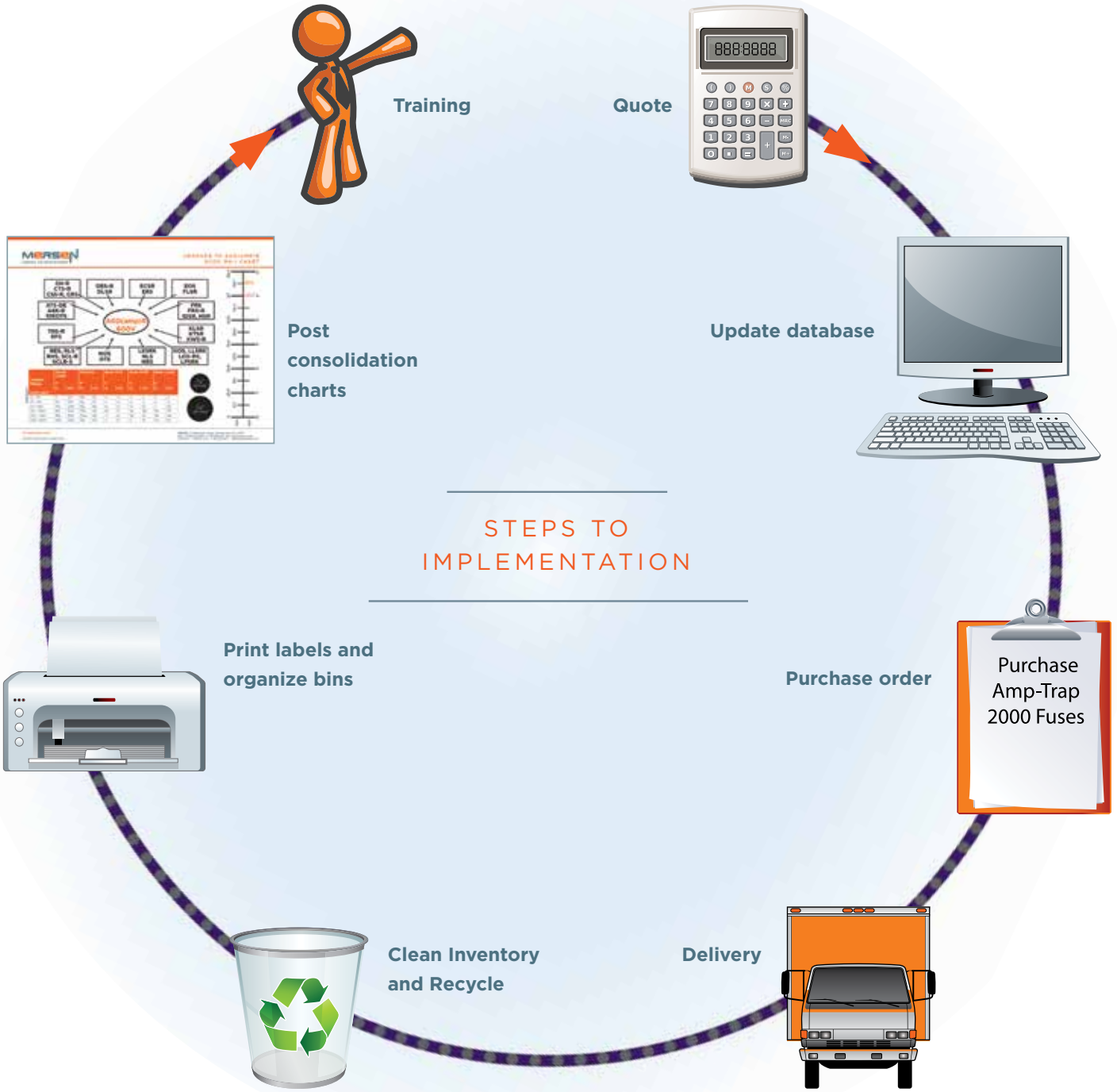
The last and most important part of implementation is training. Our reps can provide all electrical workers with our Fuse Basics Training that highlights the safety improvements with the Amp-Trap 2000 fuses. For more advanced training on such topics as fuse protection safety, arc flash mitigation and Selective Coordination, our regional field engineers can customize no cost training to fit your needs.

A SNAPSHOT OF THE IMPLEMENTATION PHASE



The implementation phase is comprised of the seven steps below, starting with “updating your database” and ending with “training” your workers. Each of these steps flow seamlessly from one to the

other. Your Mersen sales representative will work closely with you through each step and provide valuable sales and technical support.





CASE STUDIES

MillerCoors discovers the power of the Mersen's Fuse Control™ program

MillerCoors is the second largest American style beer maker in the country and an industry leader in brewing and bottling malt beverages. When Nick Zingaro, Electrical Team Leader for MillerCoors, teamed up with a Mersen sales manager, he quickly learned the benefits of the Fuse Control program. Within three months, MillerCoors cut their operation costs and reduced excess inventory by 40% by utilizing Fuse Control and upgrading to Amp-Trap 2000® fuses.

Teaming up for Fuse Control with Mersen was a win-win for MillerCoors of Albany, Georgia. MillerCoors had been actively taking steps toward improving their electrical infrastructure and safety levels and Mersen delivered them a solution that was easy, inexpensive and risk-free. By streamlining their fuse inventory and upgrading to Amp-Trap 2000 fuses, MillerCoors took a giant step forward to providing the safest work environment possible for its employees, a requirement now mandated by OSHA and NFPA regulations.

“The on-site training and cross reference material has also been a big help,” said Nick, Electrical Team Leader for MillerCoors.

Amp-Trap 2000 fuses are available in four fuse class families, Class RK1, J, CC and L, and provide the highest degree of arc flash mitigation available

on the market today. Amp-Trap 2000 fuses reduce arc energies created by electrical faults as well as arc flash incidents while being dimensionally interchangeable with most fuse products on the market. “These fuses have put us a step ahead of the arc flash curve,” said Nick.

“The fuse bins are so much more organized. It makes it very easy to find what we need,” adds Nick. “This new set-up has also made it much easier to manage my guys. I have 40 maintenance personnel that work for me. Since making this change I have had zero complaints.”

Not only did Fuse Control streamline inventory, but Mersen cleaned the storeroom bins, disposed of dead inventory and re-labeled the new bins leaving a clean and organized look. Cross reference charts and counter mats were also provided to MillerCoors. Fuse Control also contributed to a reduction in operating costs.

“It saved us money and time. With the reduced inventory, I have less part numbers to worry about,” said Angela Culliton, Brewing Planner for MillerCoors. “Since implementing this system we have not had any stock-out issues or shortages.”

In the end, MillerCoors was able to eliminate 44 of the original 117 fuse bins. All while increasing safety, lowering operating costs and reducing facility downtime. It's easy; just let the fuses do the work.





Major Chicago-based hospital saves lives with Fuse Control

A 613-bed, Chicago, Illinois medical center underwent monumental enhancements to its electrical safety and reliability by participating in Mersen's Fuse Control program. Known as one of "America's Best Hospitals" according to U.S. News & World Reports, the medical center realized that their electrical infrastructure is critical and was eager to make improvements. By participating in Fuse Control the medical center not only gained the benefits of the high performance Amp-Trap 2000 fuse family but was also able to eliminate an astronomical 73 fuse bins from their storage room, which calculated out to be a 67% reduction!

Standard benefits such as Type 2 Protection and Selective Coordination, which are delivered by the Amp-Trap 2000 fuse line, are ideal for medical facilities that rely heavily on its electrical infrastructure. The hospital was able to experience these benefits without implementing major changes or retrofits to their electrical system. "This was a no-brainer for us because the fuses are the exact fit and function of what we had installed, but just safer," said the head maintenance electrician at the medical center.

Fuse Control allows the medical center to focus on its patient care mission with the assurance that it is providing the safest method of circuit protection to both the equipment and the personnel in or around the equipment.



MORE SATISFIED CUSTOMERS...

Turkey Hill Dairy - Food Processing

"I never knew it could be this easy. I was able to reduce inventory, improve safety and reduce costs and I barely lifted a finger."

- Dennis Rapp, Turkey Hill Dairy

- **Bins Eliminated** - 42 of 128
- **Estimated Annual Dollars Saved** - \$9,240

Snap-tite, Inc. - Fluid Components

"I didn't realize how much excess inventory I had. After I made the switch my storeroom was cut in half."

- Jay Ciecierski, Snap-tite

- **Bins Eliminated** - 72 of 158
- **Estimated Annual Dollars Saved** - \$15,840

Accuride Corporation - Automotive (Trucking)

"The industry is very competitive. We were able to cut costs and shed excess inventory by using Mersen."

- Rich Moore, Accuride

- **Bins Eliminated** - 19 of 97
- **Estimated Annual Dollars Saved** - \$4,180

BrucePac - Food Processing

"We have been very satisfied with the results. It was one of the best moves we have made."

- Sandra Neal, BrucePac

- **Bins Eliminated** - 30 of 62
- **Estimated Annual Dollars Saved** - \$6,600



MERSEN IS A GLOBAL EXPERT
IN ELECTRICAL POWER AND
ADVANCED MATERIALS

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