MTAP3

Installation and User Manual

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M*TAP3* Module

Introduction

The M*TAP3* module allows facilities to test energized AC electric motors and generators, without opening the MCC or switchgear doors. The voltage at the port, where the user connects the test equipment, is less than 5V to comply with the latest OSHA and NFPA 70E guidelines for safe electrical work.

M*TAP3* modules can be used with any PdMA M-Series EMAX and MCEMAX portable testers. A custom cable connects the M*TAP3* port to the tester.

The M*TAP3* modules contain UL and CSA recognized components, and is CSA listed to UL508 and CSA 22.2 #14 standards. This module is also declared to be CE marked.

Please review this entire document before installing and testing with the M*TAP3* module.

Installation Overview

The following steps provide an overview of the installation process. Detailed installation information is provided in the remainder of this document.

1. Follow ALL electrical and other safety standards at your facility.
2. Gather all materials and tools needed for installation.
3. De-energize the motor and perform LOCKOUT, TAG-OUT.
4. Determine mounting location for M*TAP3* module.
5. Mount M*TAP3* module to front of switchgear door.
6. Install CT's and connect the CT lead wires to the corresponding phase on the terminal block. Each phase terminal block has a B and W next to it. This coincides to the color code of the CT, B (Black) and W (White).
7. Connect ground to the terminal block marked GND on the M*TAP3* module.
8. Follow plant safety procedures and restart the motor.
9. Connect the EMAX tester to the M*TAP3* port, and run an EMAX Power test to confirm installation. Note: Voltage will not be present unless a separate voltage lead has been connected from the tester to the buss line directly or a M*TAP2* module.

Installation Planning Guide

Before You Begin:

Remember to follow all safety precautions.

De-energize motor and starter cabinet before installation.

Please have the following recommended tools and materials (not included with the product) available.

Recommended Tools (not included with the product):

Metal hole punch or saw to create a 0.75-inch or 1.5-inch outside diameter hole.

Drill

Drill bit:

Size 31 to make holes for nameplate.

Screwdrivers:

3/16 inch flathead to connect wires from CT to circuit board.

Phillips head screwdrivers (#1 and #2) to connect nameplate to MCC door.

Wrench or nut driver, ¼ inch, to mount nameplate.

Pliers

Wire cutters/stripping tool

Wire crimping tool

Recommended Materials (not included with the product):

Flex tubing, approx. 10 feet, if M*TAP3* module is mounted on switchgear door.

Wire tie wraps (bag of 50)

Adhesive tie holders (bag of 15)

Materials Provided with Product:

M*TAP3* module

M*TAP3* module hardware kit (includes nameplate, connector cap, and mounting hardware)

M*TAP3* Module
E<small>MAX</small> – Motor Test Port (M*TAP3*) Installation Instructions

Please read all of the instructions carefully before attempting to install the M*TAP3*.

WARNINGS:
1. Compare CT ratings to system's current specifications.
2. Verify that all circuits are de-energized before installing this device.
3. Follow your facility's safety procedures when working with electrical circuits.
4. Remember, the M*TAP3* shall NOT be used for offline testing. When performing offline testing, be sure to disconnect the M*TAP3* and the M*TAP3* test cable from the tester and follow IEEE 43 standards.
5. If the M*TAP3* module is used or installed in a manner not specified by PdMA, the protection provided by the equipment may be impaired.
6. M*TAP3*:   Temperature Rating: 80° C
                Relative Humidity: 90 % non-condensing
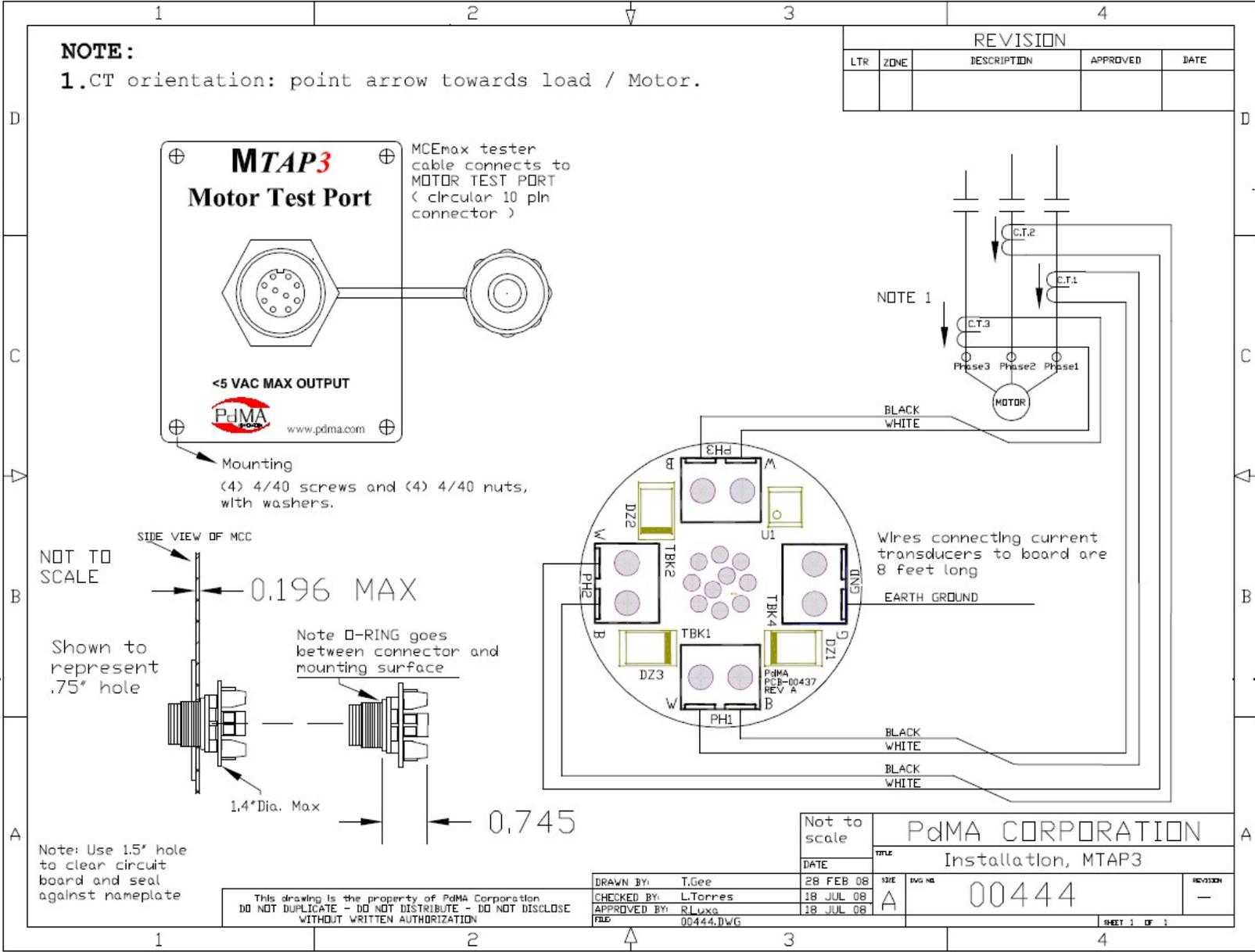
AVERTISSEMENTS:
1. Comparez les cotes CT aux spécifications ampère du système.
2. Vérifiez que tous les circuits sont hors tension avant d'installer ce dispositif.
3. Suivez les procédures de sécurité de votre installation lorsque vous travaillez avec des circuits électriques.
4. Rappelez-vous, l'MTAP3 doit PAS être utilisé pour les tests hors ligne. Lors de la réalisation des tests hors ligne, assurez-vous de débrancher le MTAP3 et le câble de test MTAP3 du testeur et suivre les normes IEEE 43.
5. Si le module MTAP3 est utilisé ou installé d'une manière non spécifiée par PDMA, la protection fournie par l'équipement peut être altérée.
6. *MTAP3:*   *Température Note: 80 ° C,*
                Humidité relative: 90% sans condensation

Mounting The M*TAP3* Module To The MCC:

The nameplate acts as a mount for the M*TAP3* and is mounted directly to the MCC cabinet. This requires a 0.75-inch diameter hole to mount from the back to the front, or a 1.5-inch outside diameter hole to mount from the front to the back. In addition, four (4) 0.120-inch diameter holes (#31 drill bit) will need to be made for mounting the nameplate.
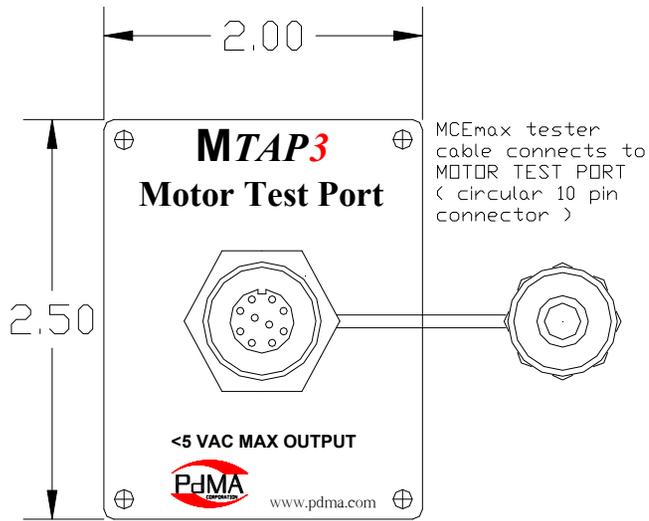
Instructions:
1. Identify a suitable location on the MCC to install the nameplate of the M*TAP3*. Refer to the following pages for mounting constraints.
2. Use the template on page 6 to locate the center hole and four mounting hole positions.
3. Drill or punch a 0.75-inch or 1.5-inch outside diameter center hole where shown.
4. Use the nameplate as a template to check the location of the four mounting holes.
5. Use a #31 drill bit to drill the four mounting holes for the nameplate.
6. Mount the connector using option A or B below. Machine screws and nuts have been supplied to attach the nameplate to the MCC door. Refer to drawings for assistance.
   A. If a 0.75-inch hole was made, remove the Retaining Nut, Cap Ring, and Nameplate from the M*TAP3*. Insert the M*TAP3* from the inside of the cabinet so that the connector is seen from the outside. Next, place the Nameplate and then the Cap Ring on the connector and secure them tightly using the Retaining Nut. Last, using the four screws provided, secure the entire M*TAP3* by mounting the Nameplate to the outside of the cabinet door.
   B. If a 1.5-inch hole was made, verify that the Nameplate is securely attached to the connector by tightening the Retaining Nut. Place the M*TAP3* in the hole with the connector and nameplate on the outside of the cabinet door. Secure the MTAP3 by mounting the Nameplate with the screws provided.
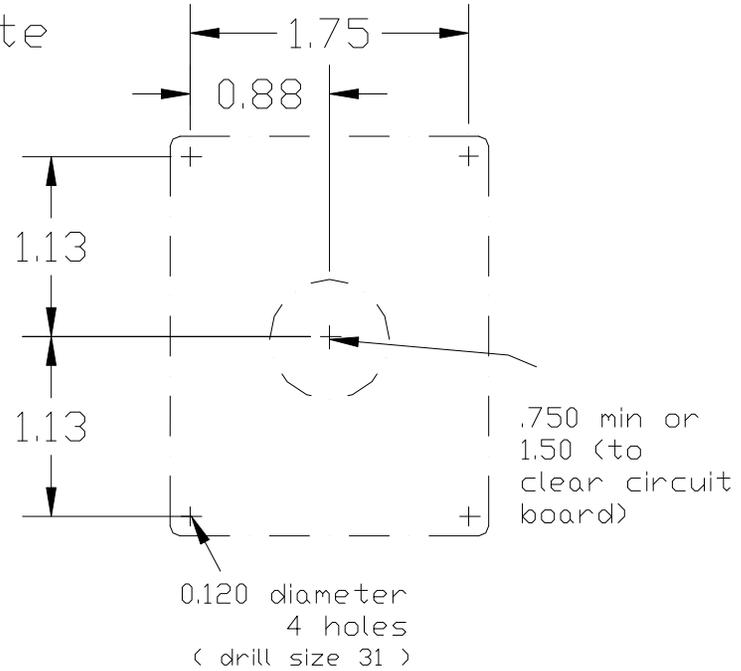
NOTE:
1. CT orientation: point arrow towards load / Motor.

MTAP3
Motor Test Port

MCEmax tester cable connects to MOTOR TEST PORT (circular 10 pin connector)

<5 VAC MAX OUTPUT

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Mounting
(4) 4/40 screws and (4) 4/40 nuts, with washers.

NOTE 1

C.T.2
C.T.1
C.T.3
Phase3 Phase2 Phase1
MOTOR

BLACK
WHITE

Wires connecting current transducers to board are 8 feet long

EARTH GROUND

SIDE VIEW OF MCC
NOT TO SCALE

0.196 MAX

Shown to represent .75" hole

Note O-RING goes between connector and mounting surface

1.4" Dia. Max

0.745

Note: Use 1.5" hole to clear circuit board and seal against nameplate

PH3
PH2
PH1
DZ2
DZ3
DZ1
U1
GND
TBK2
TBK1
TBK4
PdMA PCB-00437 REV A

BLACK
WHITE

BLACK
WHITE

REVISION				
LTR	ZONE	DESCRIPTION	APPROVED	DATE

DRAWN BY:	T.Gee	28 FEB 08
CHECKED BY:	L.Torres	18 JUL 08
APPROVED BY:	R.Luxa	18 JUL 08
FILE	00444.DWG	

Not to scale

PdMA CORPORATION
TITLE: Installation, MTAP3
SIZE: A
DWG NO: 00444
REVISION: —
SHEET 1 OF 1

Front view of MTAP3 installation

Drill Pattern
Template

2.00

MTAP3

Motor Test Port

MCEmax tester
cable connects to
MOTOR TEST PORT
(circular 10 pin
connector)

2.50

<5 VAC MAX OUTPUT

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Locate at least 2
inches from other
components on
door.

1.75

0.88

1.13

1.13

.750 min or
1.50 (to
clear circuit
board)

0.120 diameter
4 holes
(drill size 31)

M*TAP3* Module

Current Transformer (CT) Notes

(CT's are purchased separately from the M*TAP3* module.)

- The M*TAP3* current input terminal strip accepts a 0-3VAC RMS signal to represent current. CT's supplied by PdMA have the appropriate burden resistor to work with the PdMA tester.
- For safety considerations, a CT must never be open-circuited while in operation.
- Donut style and split-core style CT's supplied by PdMA have built-in burden resistors that are encapsulated, thus preventing an accidental open circuit.
- If the CT's you are using have burden resistors connected to external terminals, then take appropriate steps to minimize the possibility of an accidental open-circuit.
- When installing any CT's, be aware that CT accuracy can be affected by nearby magnetic fields. Mount the CT's to minimize interference from nearby devices containing coils, such as contactors, relays, and transformers.

M*TAP3* Procedure for the EMAX/MCEMAX Tester with MCEGold Software

The M*TAP3* collects all three phases of current only and outputs to a connector on the front of the cabinet. A dedicated M*TAP3* cable is required to connect the EMAX/MCEMAX tester to an M*TAP3*. To allow for evaluation of all fault zones, PdMA encourages the collection of voltage in conjunction with using the M*TAP3* to collect current. Voltage can be collected using an M*TAP2* or other voltage collection method.

Linking an M*TAP* Port to an Asset
Each M*TAP* module has a unique identifying microchip. The M*TAP* ID feature allows you to link the asset being tested with the M*TAP* ID. Once the link has been established between the M*TA*P and the asset, MCEGold will automatically select the linked asset once the tester is connected to the associated M*TAP* port and the Test button is selected.

If the Test button is selected while the tester is connected to an M*TAP* port which is not linked to an asset, a popup window will appear. The popup window allows you to open the M*TAP* Link Configuration window. Selecting the Link button in the M*TAP* Link Configuration window will pair the selected asset to the M*TAP*.

The M*TAP* Link Configuration window can also be accessed at any time by clicking on the M*TAP* icon in the MCEGold toolbar. In addition to linking assets to an M*TAP*, this window can also be used to unlink an M*TAP* from an asset in order to reassign the M*TAP* to a new asset.

On Your PC
   Copy the new EmaxPrb.xml file from the disk or flash drive into the folder location of the MCEGold EMAX module software folder (C;\PdMA Corporation\MCEGold\EMAX). If your facility already has the calibration file, a new one is *not* included.

MCEGold Main Page
1.   Select the motor.
2.   Select the Test Selection icon on the tool bar.

MCEGold Test Selection Window
1.   Select EMAX tab.
2.   Select Power from the test list.
3.   Select M*TAP3* from the test location.
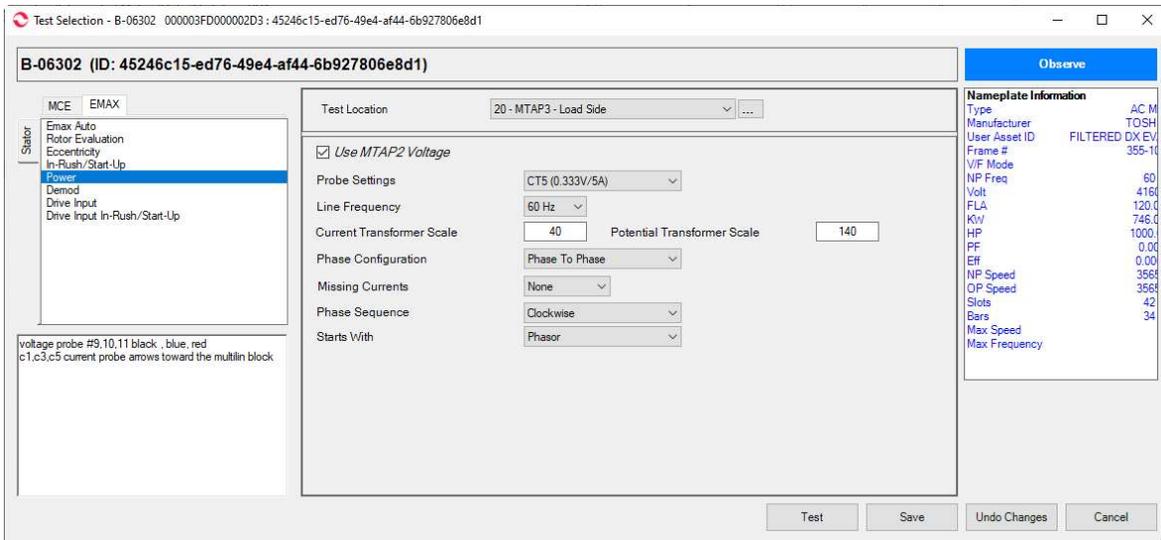
4. The Use M*TAP2* Voltage box is automatically selected when the EMAX tester identifies an M*TAP* module. The option must remain selected for proper M*TAP* voltage measurement. However, the Use M*TAP2* Voltage box should be checked if the Power Test is getting current from an M*TAP3* and voltage from an M*TAP2*. It should be unchecked if the Power Test is getting current from an MTAP3 and voltage from standard voltage leads. **NOTE:** If voltage is not being collected from the M*TAP*, but the Use M*TAP2* Voltage box is checked, then voltage readings will be inaccurate.

5. Select probes from the Probe Settings pull down menu. The M*TAP* CTs appear on the Probe Settings list with the prefix CT followed by the current rating of the CT. For example, a 5A CT appears as CT5.
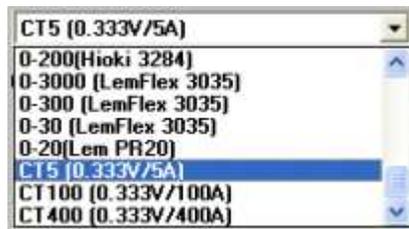
6. Enter Current Transformer Scale.
   For motors rated 600V or less, use 1.0
   For motors above 600V, use the CT ratio of the existing metering CT.

7. If voltage measurements are **NOT** being collected, enter a Potential Transformer Scale of 0.
   If voltage measurements are being collected:
   a. If the standard EMAX voltage leads are connected directly to the conductors supplying power to the motor, enter a Potential Transformer Scale of 1.
   b. If the standard EMAX voltage leads are connected to the secondary side of a PT, enter the ratio of the installed metering PT.
   c. If you are simultaneously capturing voltage data from an existing MTAP2, use the ratio from the following table.

MCEGold PT Ratio Table

AC Motor Voltage	Metering PT Required	M*TAP2* Input	M*TAP2* Output	PT Ratio to Enter in MCEGold Software
120	No	120V	30V	4
240	No	240V	30V	8
480	No	480V	30V	16
575	No	600V	30V	20
690V and up	Yes	120V	30V	Existing PT ratio x 4
690V and up	Yes	240V	30V	Existing PT ratio x 8

8. Select correct Phase configuration, Missing Currents, Phase Sequence, and Starts With settings.
9. Click Save to save the Test Setup Settings.

Installation Confirmation

1. Select Power from the test selection.
2. Click Test to run an EMAX Power Test to confirm that the installation and settings are correct.
3. Check Power Test results page for correct values of current and voltage if captured from a MTAP2.

M*TAP3* Product Certification Information

The cCSAus mark on a product means that CSA International certifies the product for both the U.S. and Canada, to applicable U.S. and Canadian standards.

More information about the certification mark can be found at:
http://www.csa-international.org/certification_marks/

M*TAP3* Product Certification:
- CSA listed to UL508, CSA 22.2 #14
- CE Mark