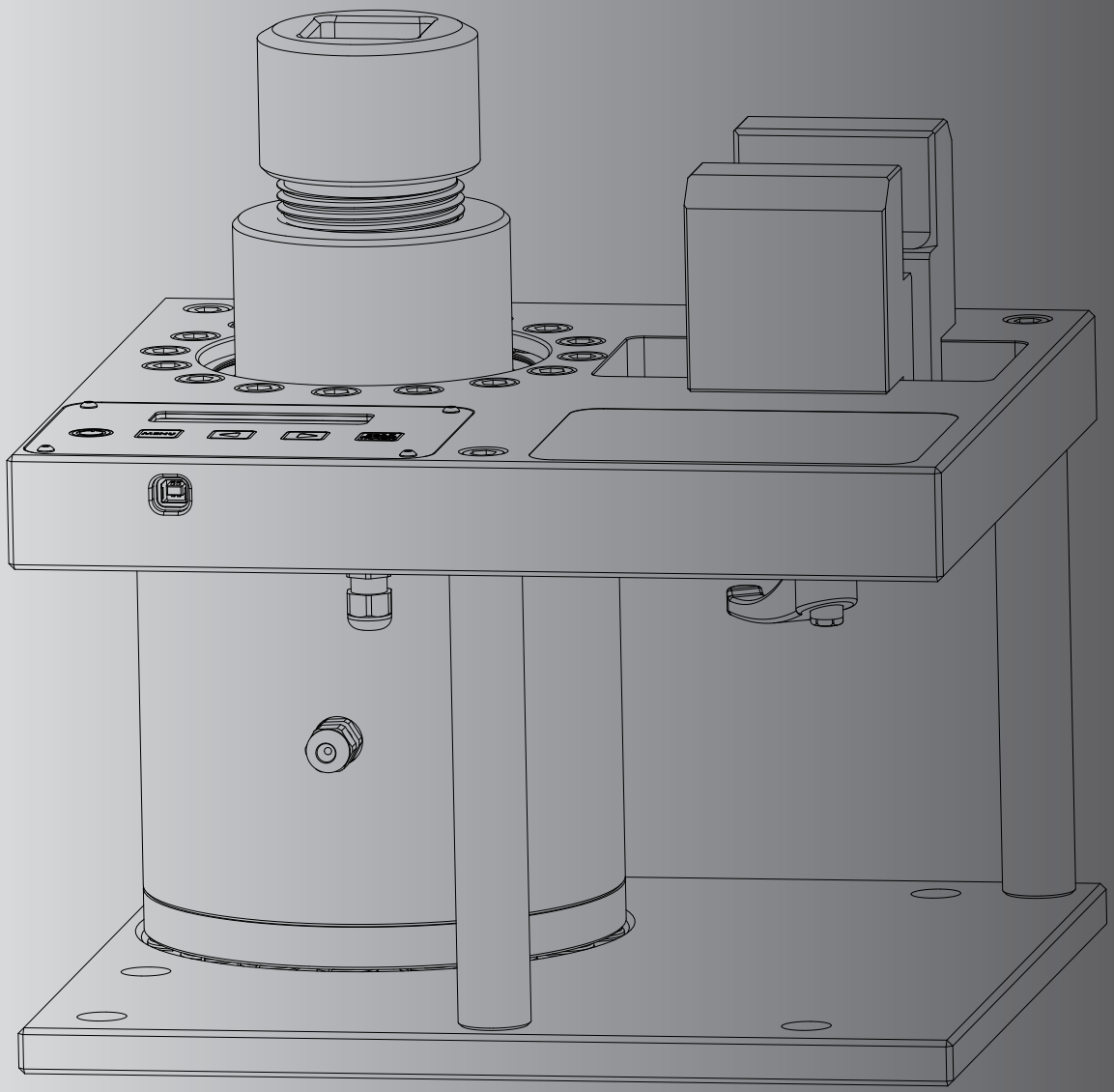
ENERPAC

L4370
Rev. G 01/25

Mobile Calibration System

MCS7500C



Instruction Sheet

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1.0 INTRODUCTION

1.1 System Overview

The MCS7500C Calibration System allows users to check torque accuracy, run calibration tests, and create calibration certificates for bolting tools. The MCS7500C is designed for corded electric, hydraulic and pneumatic tools, such as the Enerpac PTW- and ETW-Series Torque Wrenches, as well as similar controlled bolting fastening systems.

⚠ DANGER Not Suitable for use with battery, low-profile torque wrenches or impact tools

The calibration system is a calibrated instrument qualified in a UKAS certified laboratory. The accuracy of the MCS7500C is calibrated to meet or exceed: 1% of Full Scale Deflection (FSD) from 2% to 8% of torque range and 1% of reading from 8% to 100% of torque range.

Upon delivery, all components must be inspected for damage incurred during shipping. If damage is found, the carrier should be notified at once. Shipping damage is not covered by the Enerpac warranty.

Please read the full Instruction Sheet before using the MCS7500C.

The MCS7500C includes:

- 1 Dynamic run down fixture with 1.5" female square drive, and the following adapters (1):
  - 1.5" to 1" x 2" tall
- 1 Base plate (2)
- 1 Standard reaction stop, and secondary reaction post (3)
- 1 Digital LCD display module with global outlet adaptor (4)
- 1 Calibration software with USB plug (not shown)
- 1 standard hard case (not shown)
- 1" x 1-1/2" adaptors available as an accessory on request
- ¾" x 1-1/2" adaptors available as an accessory on request.
- Drawings of the Special Reaction block and adaptors designed for usage in combination with Enerpac S-Series, RSL-Series and DSX-Series hydraulic square drive wrenches available upon request.

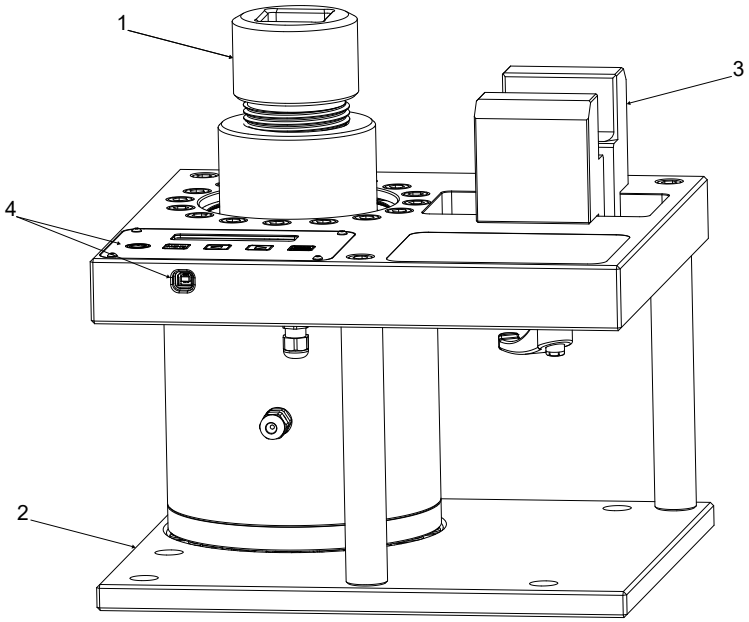


Fig. 1

1.2 Main Components

Run down fixture and transducer – The run down fixture and transducer are designed specifically for the testing of constant rotation controlled bolting tools. The MCC7500 features a 1.5" female square drive that can accommodate other size square drive tools with the use of adaptors. The dynamic fixture provides a fastening solution that is similar to real life applications. An integrated transducer measures the torque and communicates the results to the digital display module. The run down fixture can be adjusted vertically to accommodate various tool designs.

Base plate - The base plate houses the run down fixture, reaction stop, and digital display module. It features three sturdy legs, end slot to transport the unit, and can be fastened down to a flat surface.

Reaction stop – The reaction stop functions as a counterpoint to the reaction arms of the wrench. The torque wrench being calibrated is positioned with the reaction arm in between the wings of the reaction stop. The MCS7500C features a standard reaction stop that will accommodate most pneumatic and electric tools, including the PTW-, ETW-Series and many competitive tools. It also features a special reaction post for tools with configurations that won't work with the standard reaction stop.

Digital display module –The digital display module facilitates the display, collection, archiving, and processing of torque readings. The module can run off battery power or plugged into an outlet. Each MCS7500C is equipped with a global outlet adaptor that allows the tool to be used with many electrical systems.

Fig. 2 - Digital Display

When used with the Torque To Spreadsheet (TTS) software, the digital display module can be attached to a computer with a USB plug (see Section 1.3).

The TTS software is included with the standard MCS7500C package. The MCS7500C can interface with the test stand using a USB cable. The software facilitates the calibration testing of torque wrenches and can be used to create calibration certificates. Windows 7/8/10 is required to install the TTS software. Microsoft Excel is required to export and display the torque readings.

1.3 Electrical Connections

The digital display module includes a USB/battery charger port as shown in Figure. 3.

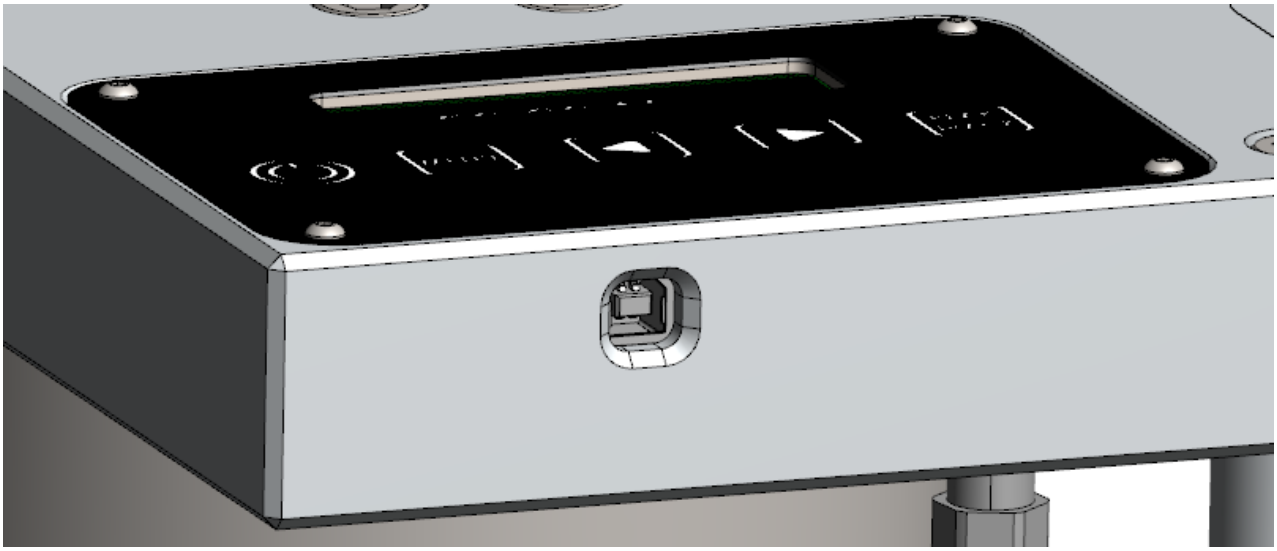


Fig. 3 - USB/ Battery charge port

1.3.1 DC Interface

The interface for the 5V DC USB AC adapter is supplied with the MCS7500C. Use the adapter if you plan on using the main power source.

⚠ CAUTION Use only the AC adapter provided with the MCS7500C. If another power source is used it will **void the warranty and may cause severe damage to the digital display module.**

1.3.2 USB Connections

The USB interface cable shown below is used when downloading to a computer, or other device. The values are sent every time a reading in Peak mode is taken on the MCS7500C (see Figure 7).

Replacement USB cable and Power Supply Cable can be ordered using part numbers:

- USB Cable: VSSPX-0000-ENXXUS,
- Power Supply Unit: VSSPX-0000-ENXXPS.

Fig. 4 - Standard USB Cable ICBL-USB

1.3.3 Charging the Battery

Follow the standard operating procedures in your workplace and be sure to observe all communicated safety precautions.

- The battery for the MCS7500C should last approximately 12 hours when fully charged.
- The battery is charged any time the MCS7500C is plugged-in. The charge time is between 2 and 4 hours depending on the battery charge level. It is recommended that the user unplug the unit when it is not in use. This will not harm the unit and will increase battery life.

NOTE: If the MCS7500C is stored for several months make sure the battery is completely charged prior to storage.

1.4 Conformance to National and International Standards

•MCS7500C

These tools conform with the requirements for CE and UKCA.

Enerpac declares that the product(s) have been tested and conforms to applicable standards and the product(s) are compatible to all EU and UK Requirements.

Copies of the EU Declaration as well as the UK Self-Declaration are enclosed with each shipment.

Follow the standard operating procedures in your workplace and be sure to observe all communicated safety precautions.

2.0 SAFETY

Read all introductions carefully. Follow all recommended safety precautions to avoid personal injury as well as damage to the product and / or damage to other property. Enerpac cannot be responsible for any damage or injury from unsafe use, lack of maintenance, or incorrect operation. Do not remove warning labels, tags, or decals. In the event of any questions or concerns arising, contact Enerpac or a local Enerpac distributor for clarification.

This manual follows a system of safety alert symbols, signals, words, and safety messages to warn the user of specific hazards. Failure to comply with these warnings could result in death or serious personal injury, as well as damage to the equipment or other property.

2.1 Introduction

The Safety Alert Symbol appears throughout this manual. It is used to alert you to potential physical injury hazards. Pay close attention to Safety Alert Symbols and obey all safety messages that follow this symbol to avoid the possibility of death or serious injury.

Safety Alert Symbols are used in conjunction with certain Signal Words that call attention to safety messages or property damage messages and designate a degree or level of hazard seriousness. The Signal Words used in this manual are WARNING, CAUTION, and NOTICE.

DANGER **Indicates a hazardous situation that, if not avoided, will result in death or serious personal injury.**

WARNING **Indicates a hazardous situation that, if not avoided, could result in death or serious personal injury.**

CAUTION **Indicates a hazardous situation that, if not avoided, could result in minor or moderate personal injury.**

NOTICE *Indicates information considered important, but not hazard related (e.g. messages relation to property damage). Please note that Safety Alert Symbol will not be used with the signal word.*

2.2 General Safety

Observe the following safety precautions. Note that under some circumstances, additional safety precautions beyond those described in this manual may be required.

- Be sure you have read and understood the instruction manual prior to using the tool.
- Make sure you have completed safety training specific to the work surroundings. The operator should be thoroughly familiar with the proper use of the calibration system.
- The operator must be at least the minimum age required by applicable local regulations, laws, and the facility's standard operating procedures.
- Make sure your workplace is safe.

2.3 Mobile Calibration System Safety

The following hazard messages are specific to the Mobile Calibration System (MCS).

⚠ WARNING Failure to observe and comply with the following precautions could result in death or serious personal injury. Property damage could also occur.

- Always wear appropriate personal protection equipment such as protective head wear, eye protection, footwear, and gloves suitable for safe operation of the MCS. The protective clothing must not interfere with safe operation of the system or restrict the ability to communicate with co-workers.
- Prior to use, check reaction stops for cracks and replace if any sign of deterioration is found. Check reaction stop mounting bolt torque regularly.
- Do not stand in the line of movement of the tool when it is in operation. If the reaction stop should break, it will detach in that direction.
- Keep loose clothing, hair, and other items from being caught in any rotating part of the tool being calibrated.

⚠ CAUTION Failure to comply with the following precautions could result in minor or moderate personal injury.

- Do not place any objects between the reaction arm and the reaction stop. Keep the cords away from the reaction stop.
- When operating, ensure full contact is achieved between the reaction arm and the reaction stop.
- The maximum torque rating of the MCS7500C is 7375 Ft.lbs (10,000 Nm). Never exceed the torque rating of the MCS7500C.

2.4 Use and Care

- Do not operate the equipment with a damaged cord or plug, or after the equipment malfunctions, or is dropped or damaged in any manner. Return the equipment to the nearest Enerpac Authorized Service Center for examination or electrical and mechanical repair.
- Store the MCS7500C in a secure, dry location. Keep out of reach of children.

2.5 Disconnect Electrical Power

To disconnect, turn the On/Off switch to the OFF (“O”) position, then remove plug from the outlet.

- Do not unplug by pulling on cord. To unplug, grasp the plug not the cord.
- Unplug from 5V DC outlet when not in use and before servicing or cleaning.

3.0 SETUP AND ADJUSTMENTS

3.1 Mount the Torque Wrench

- Remove the MCS7500C components from the packaging and place on a flat surface. Ensure that the digital display module is plugged in or sufficiently charged to operate.
- Select and position an appropriate adaptor onto the run down fixture to allow the proper mounting of the torque wrench.
- Mount the torque wrench vertically onto the run down fixture, positioning the reaction arm between the reaction stop wings, and lower the wrench into position. For safe operation, the square drive of the wrench must fit into the run down fixture, with the wrench reaction arm positioned to fully engage the reaction stop as shown in Figure 5:

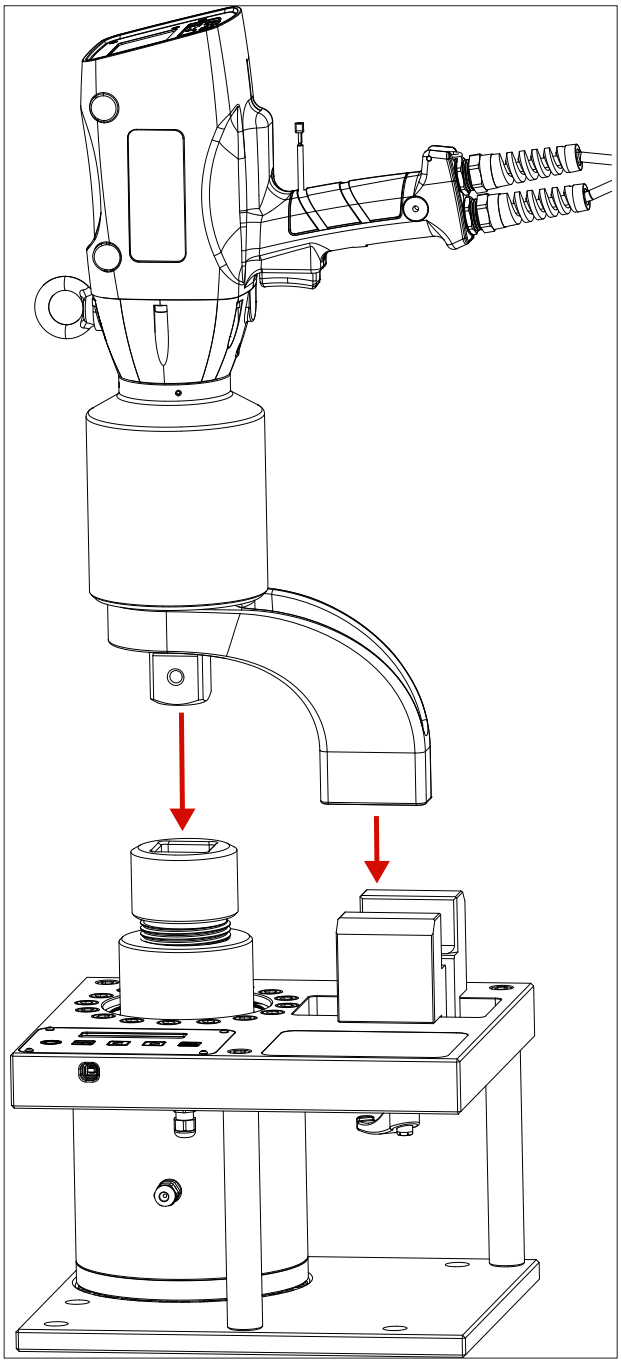


Fig. 5 - Fitting torque wrench

3.2 Adjust the Run Down Fixture and Reaction Stop

If the tool will not fit as indicated, the run down fixture can be adjusted vertically, and the reaction stop can be adjusted in a straight line perpendicular to the run down fixture (see Figure 6).

3.2.1 Run Down Fixture

- To vertically adjust the run down fixture, use the appropriate adapter that provides the required positioning to achieve full reaction arm engagement. It is important to reverse (loosen) the run down fixture for testing.

3.2.2 Reaction Stop

- To adjust the reaction stop, loosen the handle as shown in Figure 6.
- Slide the reaction stop to properly position the reaction arm and fully engage the reaction stop per manufacturer's recommendation.
- Slide the reaction stop to the desired position. Lock into place by rotating the lock handle located directly under the reaction stop.

Once the MCS7500C unit has been appropriately adjusted, complete the mounting of the tool.

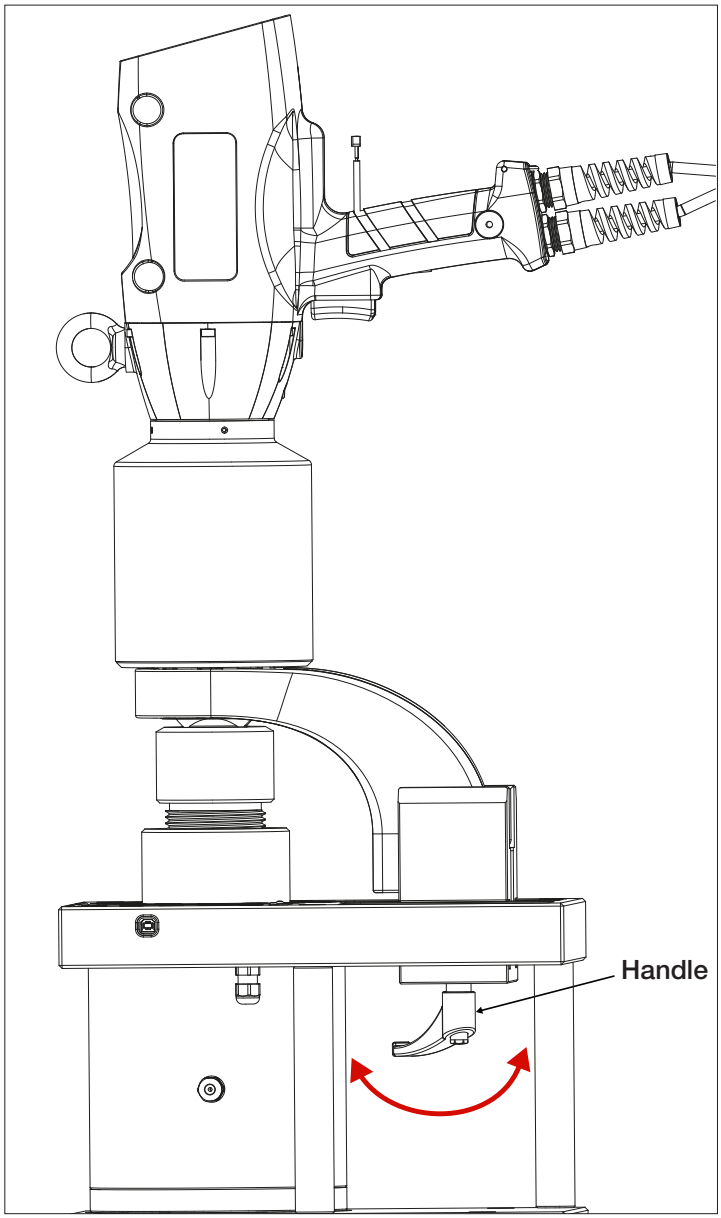


Fig. 6 - Securing reaction arm

3.3 Torque To Spreadsheet Software (TTS)

The Torque To Spreadsheet (TTS) software is an intuitive application that allows users to connect to an MCS7500C or digital transducer through a USB cable. This application facilitates the display, collection, archiving, and processing of torque readings. Microsoft Excel is launched by the application.

3.3.1 Software Requirements

- Windows 7/8/10
- Microsoft Excel is required for the exporting and graphing function.

3.3.2 Installing the Software

- Install the TTS software by extracting the file EnerpacVSES.exe provided by Enerpac, onto a PC.
- The EnerpacVSES.exe can also be downloaded at the following link:

  https://www.enerpac.com/en-us/calibration-systems/mobile-calibration-system/MCS7500C.
- Please read the Readme file before extracting files and installing the software.
- Follow the instructions on the screen to finish installing.
- The driver for the cables can be installed by running CP210x USB to UART Bridge Virtual COM Port.

NOTE: Install the driver for the USB cable only if the software fails to recognize the cable.

4.0 OPERATION

4.1 Check Torque with Digital Display

⚠ CAUTION

- Activate the wrench, ensure that all safety precautions are being followed. Take note of potential pinch points when handling the torque wrench during calibration testing.
- After the wrench stalls, the peak reading will momentarily appear on the display module, and then is saved. For the next cycle it is important to reverse the tool and loosen the run down fixture.

NOTE: The default setting for the torque reading is peak. To take a peak reading, ensure that the “Peak” icon appears under the torque reading on the display module (see Figure 7).

4.1.2 Digital Display Overview

The digital display has **five** main buttons: ON/OFF, MENU, PEAK/TRACK, LEFT AND RIGHT (Figure 7, Items 1-4).

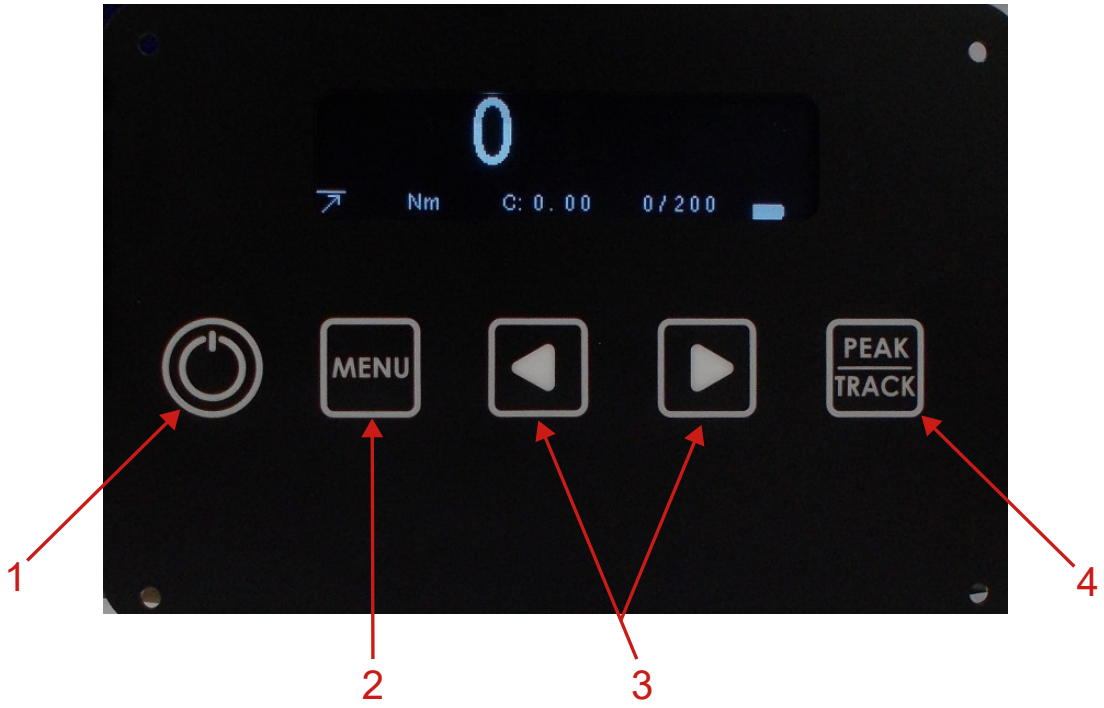


Fig. 7 - MCS7500C Digital Display

The display module can be set up to perform other functions, such as tracking the torque. The amount of time that the reading is displayed cannot be adjusted. For a detailed description of the available functions, see Section 5.

4.2 Using the TTS Software

The TTS software can be used to check torque values, collect and export torque readings, and generate calibration certificates. The calibration certificates can also be generated from predefined or custom-made calibration tests.

After properly completing the setup, the MCS7500C must be connected to a computer via the USB cable. The computer must feature Windows 7/8/10 and include Microsoft Excel®. This allows the torque readings to be transferred and calibration forms to be generated.

- Launch the EnerpacVSES software. The “Start spreadsheet export” Tab is displayed.

NOTE: The TTS software should detect the MCS7500C under “Available COM Ports”. If the TTS is launched prior to attaching the cable, the user must select “Rescan COM ports” to prompt the TTS to identify the MCS7500C as an available COM Port.

- Verify that the digital display module is showing the desired output, and correct functions, such as Peak and Ft.lbs. Adjust the settings as needed following the instructions in Section 5.

4.3 Performing a Calibration and Producing a Calibration Certificate for Corded Electronic tools

1. Ensure the correct drivers and software are loaded onto the PC to be used for the calibration, as stated in section 4.2
2. Connect the MCS7500C to the PC using the supplied USB type B to type A cable.
3. Run “EnerpacVses.exe” by double clicking the icon. The following window will be displayed:

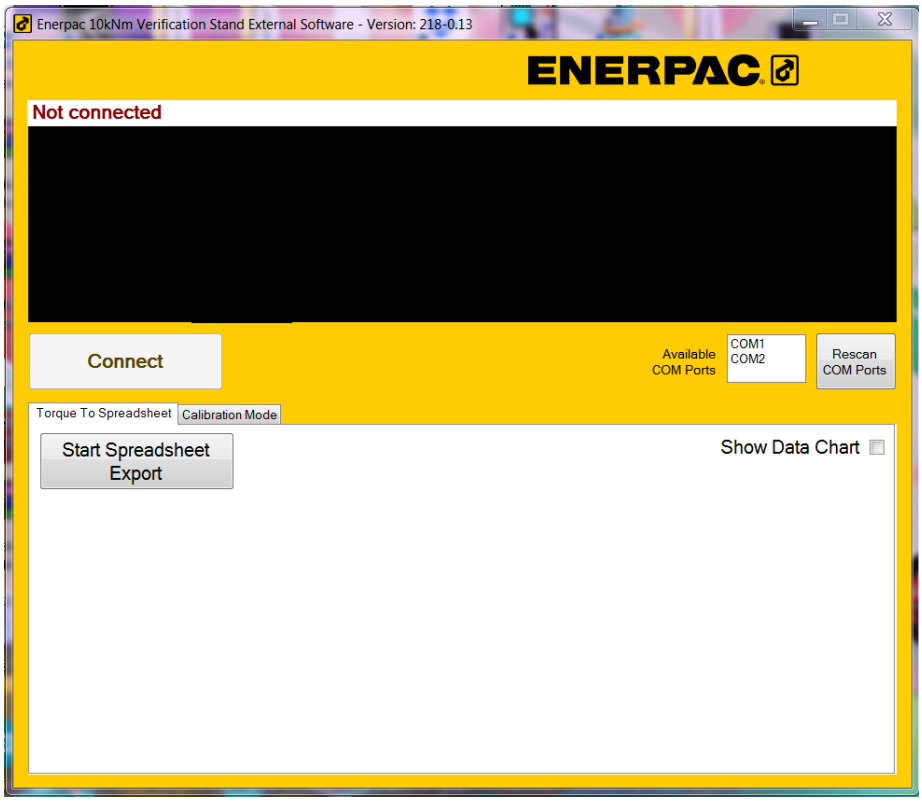


Fig. 8 - Starting TTS Display (ETW)

4. Select the correct Com port by clicking the name of the required port (this can be found by going to Control Panel\Hardware and Sound\Devices and Printers in windows and checking the port number allocated to the CP210x USB to UART bridge in USB devices).

5. Click the "Connect" button to connect the PC to the MCS7500C unit. The display window will now update and show "Listening on COM2" in the top left of the window, see Figure 9:

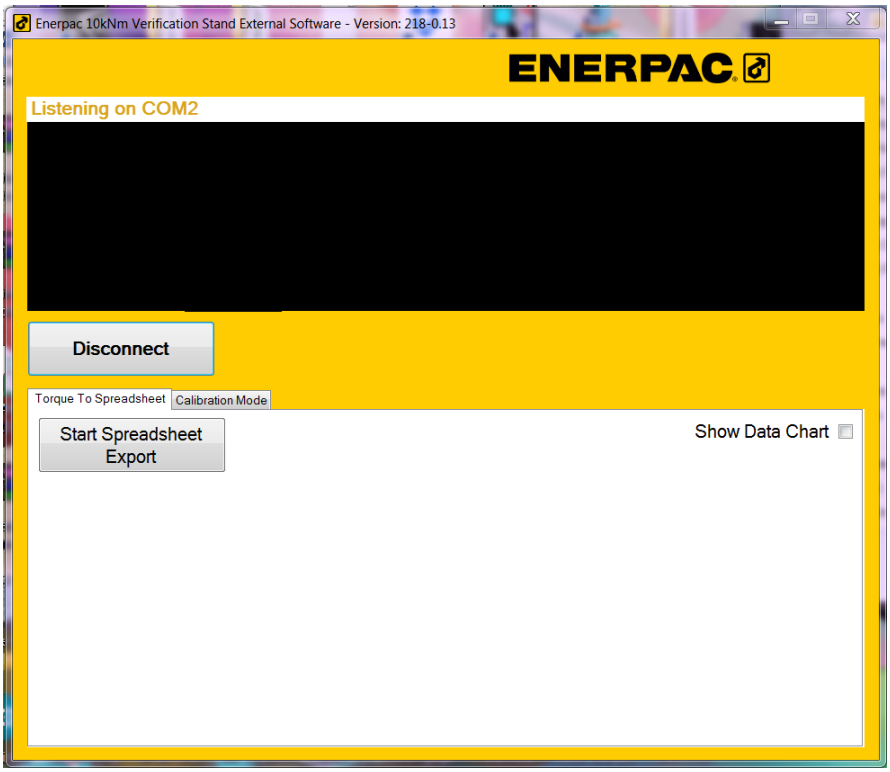


Fig. 9 - TTS Display after connecting to PC (ETW)

6. Select the "Calibration Mode" tab. The window will update with fields which are used to specify the number of data points, UUT info etc. :

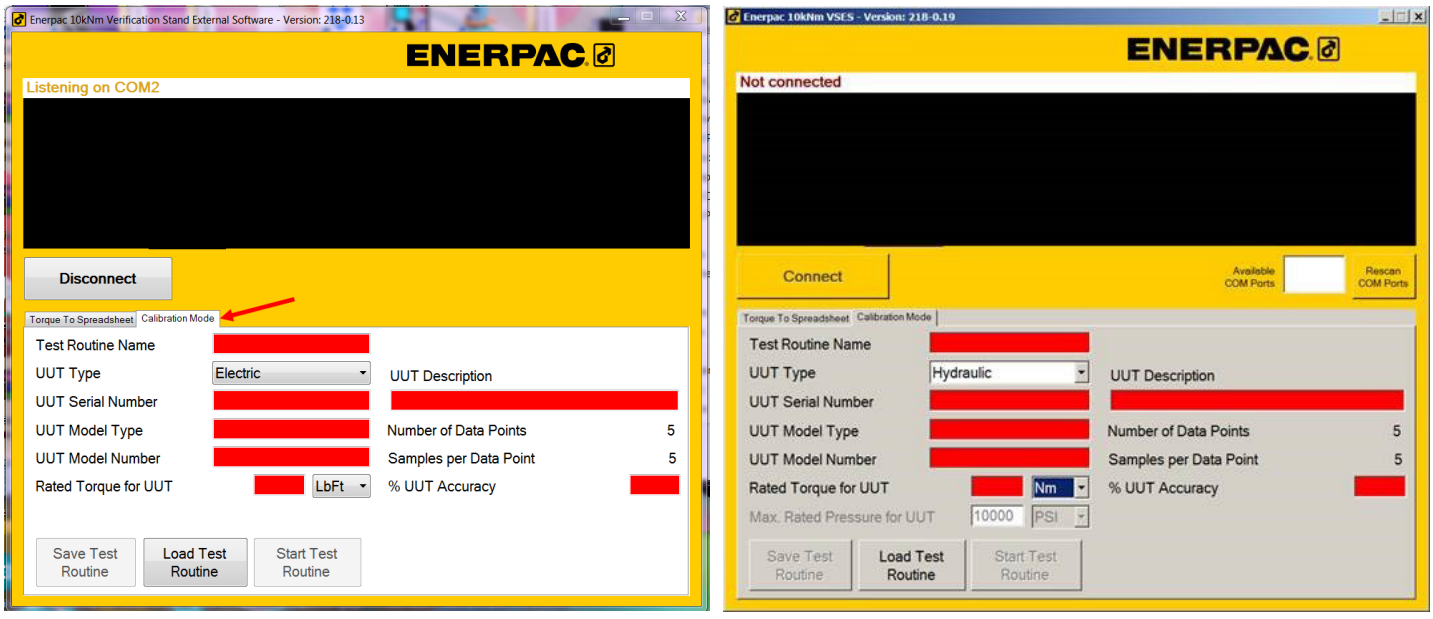


Fig. 10 + 10b - Calibration Mode tab (ETW and Hydraulic)

7. Enter in all the required information into the text fields. In “UUT Type” drop-down box select “Electric”. See Figure 11:

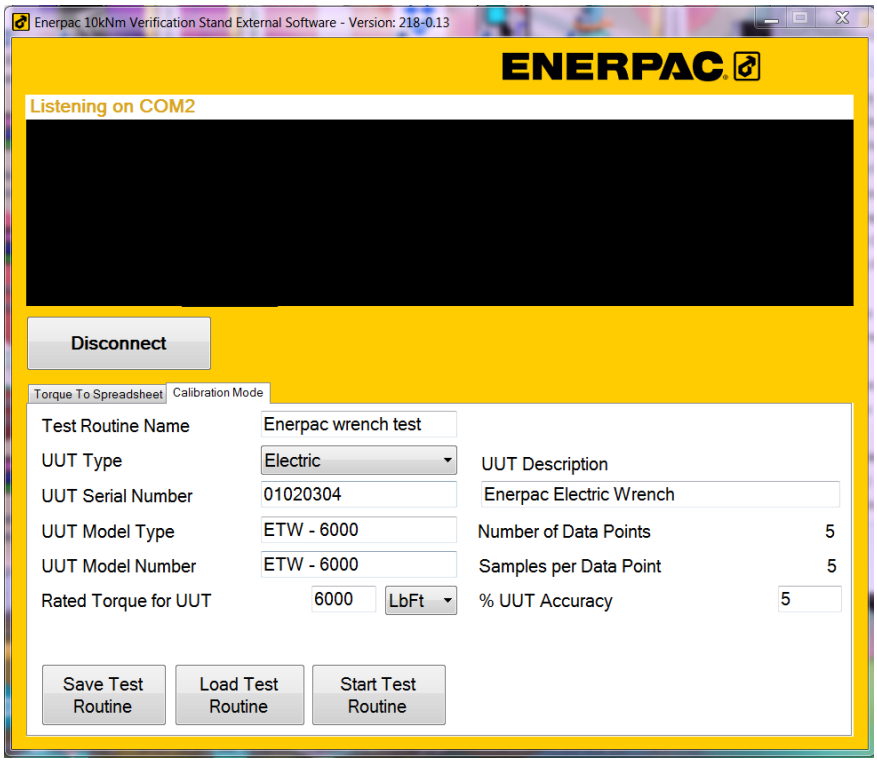


Fig. 11 - Updating Calibration Mode (ETW)

8. Click the “Start Test Routine” button to start the calibration.
9. A spreadsheet will be created with the specified data points and limits, as set in the previous window.
10. Fit wrench to dynamic joint as specified in section 3.1. Ensure dynamic joint has been greased before use.
11. Set the target torque on the wrench controller, as specified in blue on the spreadsheet for data point 1. In this case it is 1200 Ft.lbs. See Figure 12:

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2		Test Routine Name			Enerpac wrench test							
3		UUT Serial Number			01020304							
4		UUT Model Type			ETW - 6000							
5		UUT Model Number			ETW - 6000							
6		Rated Torque for UUT			6000LbFt							
7												
8												
9		**Take sample 1 for Data Point 1 (20.0% of 6000) : 1200**										
10												
11				Status								
12												
13		Data Point	Average	Low	Target	High	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Units
14		1		1093	1200	1307						LbFt
15		2										
16		3										
17		4										
18		5										
19												
20												
21												
22												

Fig. 12 - Test Routine Spreadsheet (ETW)

12. Actuate the trigger on the wrench. The dynamic joint fixing will start to rotate and the wrench will shut off when it hits its target torque. Once the cycle has finished, Sample 1 of data point 1 will be populated automatically, with the reading taken during the run down. See Figure 13:

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2		Test Routine Name			Enerpac wrench test							
3		UUT Serial Number			01020304							
4		UUT Model Type			ETW - 6000							
5		UUT Model Number			ETW - 6000							
6		Rated Torque for UUT			6000LbFt							
7												
8												
9		**Take sample 2 for Data Point 1 (20.0% of 6000) : 1200**										
10												
11				Status		OK						
12												
13		Data Point	Average	Low	Target	High	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Units
14		1	1208	1093	1200	1307	1208					LbFt
15		2										
16		3										
17		4										
18		5										
19												
20												
21												
22												

Fig. 13 - Test Routine Spreadsheet in use (ETW)

An average of the readings and status of reading will also be populated into the spreadsheet.

The last reading can be cancelled by clicking the “Cancel last sample” button. This may be necessary if the joint was not backed off before the run down or an incorrect target torque was set.

13. Before preforming the second and after every subsequent run down, the dynamic joint must be undone by setting the wrench to counter-clockwise and actuating the trigger.

14. Continue performing run downs until all the data point samples have been populated, see Figure 14:

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2		Test Routine Name			Enerpac wrench test							
3		UUT Serial Number			01020304							
4		UUT Model Type			ETW - 6000							
5		UUT Model Number			ETW - 6000							
6		Rated Torque for UUT			6000LbFt							
7												
8												
9		**Test Complete**										
10												
11				Status		OK						
12												
13		Data Point	Average	Low	Target	High	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Units
14		1	1264	1093	1200	1307	1228	1275	1348	1221	1249	LbFt
15		2	2477	2186	2400	2614	2401	2349	2644	2595	2398	LbFt
16		3	3584	3280	3600	3920	3573	3567	3587	3613	3581	LbFt
17		4	4848	4373	4800	5227	4779	4770	4762	4885	5045	LbFt
18		5	5963	5466	6000	6534	5957	5886	5978	6020	5972	LbFt
19												
20												
21												
22												

Fig. 14 - Completed Test Routine Spreadsheet (ETW)

15. On the main Enerpac VSES program, click the “Export to pdf” button to create the certificate. The program will create a spreadsheet with an input tab and a certificate tab, at the bottom of the spreadsheet:

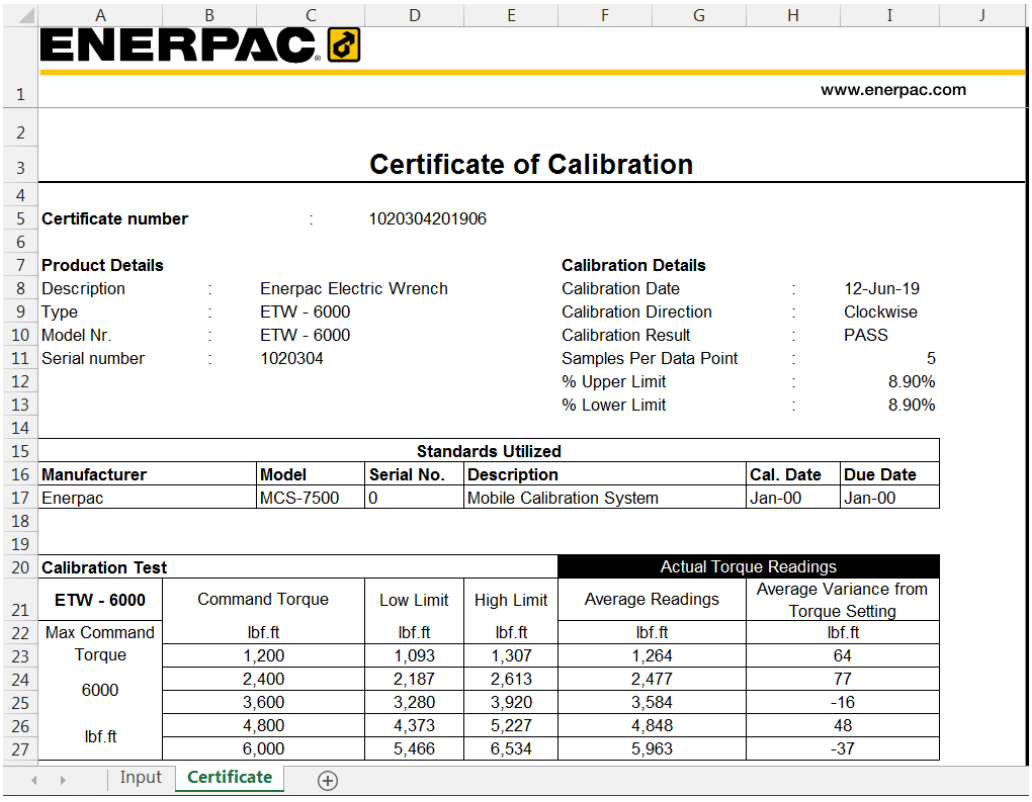
	A	B	C	D
1	ENERPAC			
2				
3		**Pre Calibration Details**		**Comments**
4				
5	Tester Details:	Name		
6				
7	Company			
8				
9				
10	Master Equipment:			
11				
12	Manufacturer	Enerpac		
13	Model	MCS-7500		
14	Serial number			
15	Description	Mobile Calibration System		Advised calibration frequency once a year
16	Calibration Certificat Nr.			
17	Calibration Date			
18	Calibration Due Date			
19				
20		**Calibration Details**		**Comments**
21				
22	Calibration Date	12-Jun-19		always today; can't be changed
23				
24	Certificate Nr.	1020304201906		Serial nr. + Calibr Date Y/M
25				
26		1,200		5 measurements will be taken against these Command Torques.
27		2,400		
28	Command Torque	3,600		
29		4,800		
30		6,000		
31				
32	Description	Enerpac Electric Wrench		
33	Type	ETW - 6000		

Input | Certificate

Fig. 15 - Calibration Certificate Input sheet (ETW)

Fill in the unpopulated fields with the relevant information. **NOTE:** Master equipment is the MCS7500C verification stand details. Calibration certificate number and calibration/due dates can be obtained from the original calibration certificate supplied with the unit.

16. Select the certificate tab to view the calibration certificate.



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Certificate of Calibration

Certificate number : 1020304201906

Product Details			**Calibration Details**		
Description	:	Enerpac Electric Wrench	Calibration Date	:	12-Jun-19
Type	:	ETW - 6000	Calibration Direction	:	Clockwise
Model Nr.	:	ETW - 6000	Calibration Result	:	PASS
Serial number	:	1020304	Samples Per Data Point	:	5
			% Upper Limit	:	8.90%
			% Lower Limit	:	8.90%

Standards Utilized

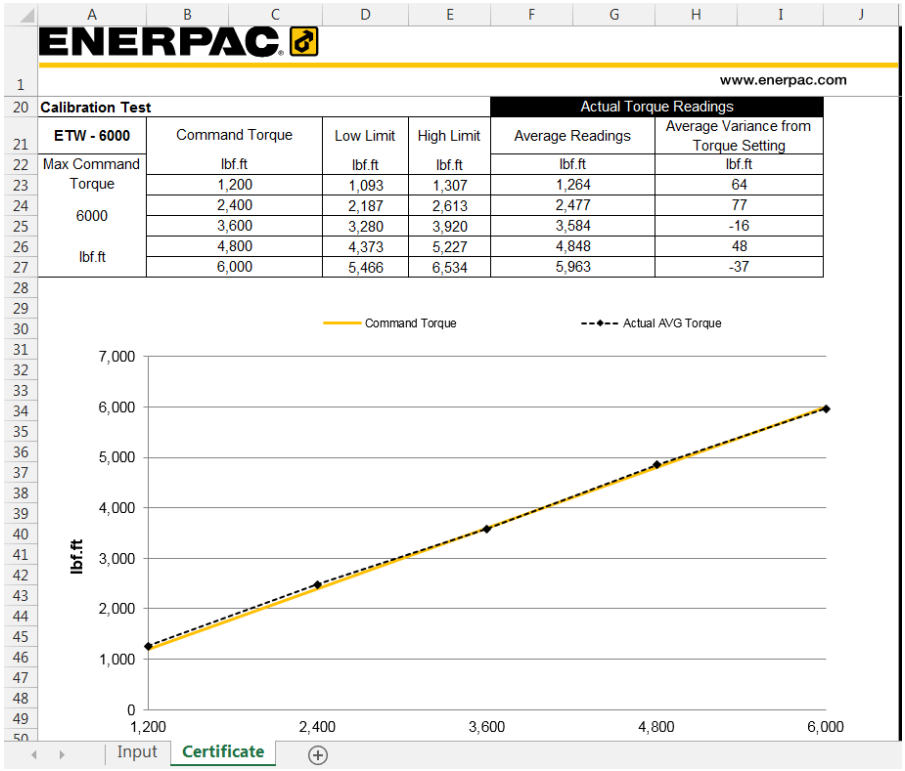
Manufacturer	**Model**	**Serial No.**	**Description**	**Cal. Date**	**Due Date**
Enerpac	MCS-7500	0	Mobile Calibration System	Jan-00	Jan-00

Calibration Test				Actual Torque Readings	
ETW - 6000	Command Torque	Low Limit	High Limit	Average Readings	Average Variance from Torque Setting
Max Command	lbf.ft	lbf.ft	lbf.ft	lbf.ft	lbf.ft
Torque	1,200	1,093	1,307	1,264	64
6000	2,400	2,187	2,613	2,477	77
	3,600	3,280	3,920	3,584	-16
lbf.ft	4,800	4,373	5,227	4,848	48
	6,000	5,466	6,534	5,963	-37

Input | Certificate

Fig. 16 - Calibration Certificate tab (ETW)

Calibration result, readings taken and a graph to show deviation from target (command torque) are all displayed within the certificate in both Ft.lbs and Nm.



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Calibration Test				Actual Torque Readings	
ETW - 6000	Command Torque	Low Limit	High Limit	Average Readings	Average Variance from Torque Setting
Max Command	lbf.ft	lbf.ft	lbf.ft	lbf.ft	lbf.ft
Torque	1,200	1,093	1,307	1,264	64
6000	2,400	2,187	2,613	2,477	77
	3,600	3,280	3,920	3,584	-16
lbf.ft	4,800	4,373	5,227	4,848	48
	6,000	5,466	6,534	5,963	-37

Input | Certificate

Fig. 17 - Completed Calibration Certificate (ETW)

A copy can be printed, by selecting File, Print, and/or a copy can be saved to any preferred directory by selecting File, Save as and selecting the directory in which the copy needs to be saved.

4.4 Performing a Calibration and Producing a Calibration Certificate for Pneumatic tools

1. Ensure correct drivers and software are loaded onto the PC in use, as stated in section 4.2
2. Connect the MCS7500C to the PC using the supplied USB type B to type A cable.
3. Run “EnerpacVses.exe” by double clicking the icon. The following window will be displayed:

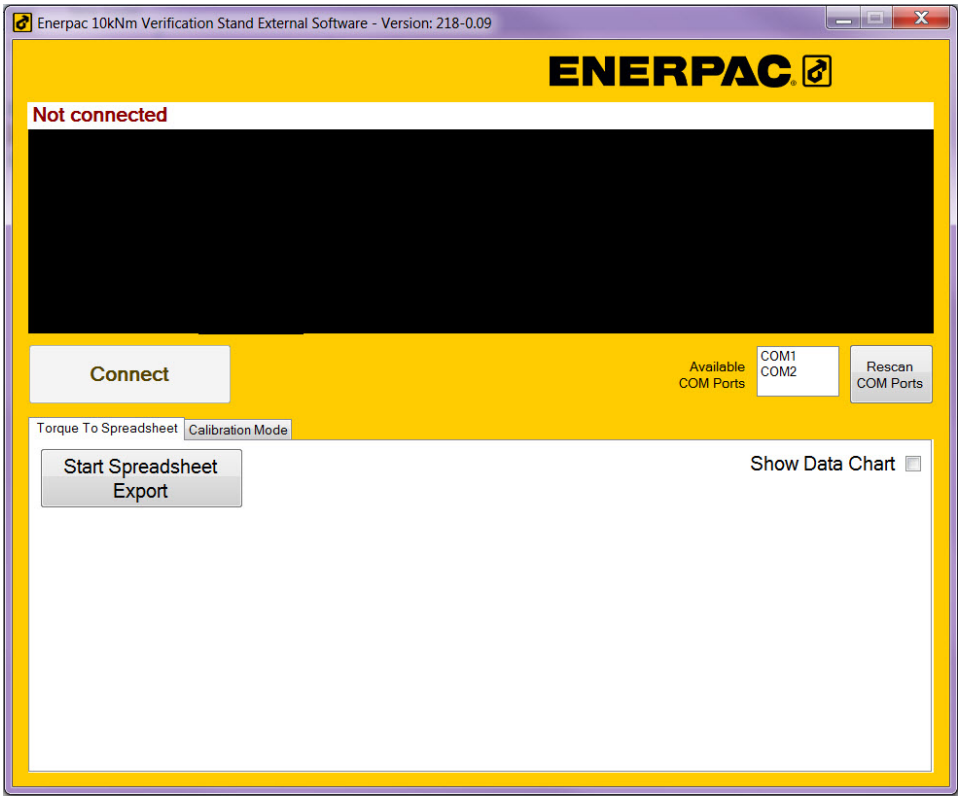


Fig. 18 - Starting TTS Display (PTW)

4. Select the correct Com port by clicking the name of the required port (this can be found by going to Control Panel\Hardware and Sound\Devices and Printers in windows and checking the port number allocated to the CP210x USB to UART bridge in USB devices).

NOTE: If no COM ports are shown in the “Available COM port” box, click “Connect” and the unit will automatically connect to the PC.

5. Click “Connect” button to connect the pc to the MCS7500C unit. The window will now update and show “Listening on COM2” in the top left of the window, see Figure 19:

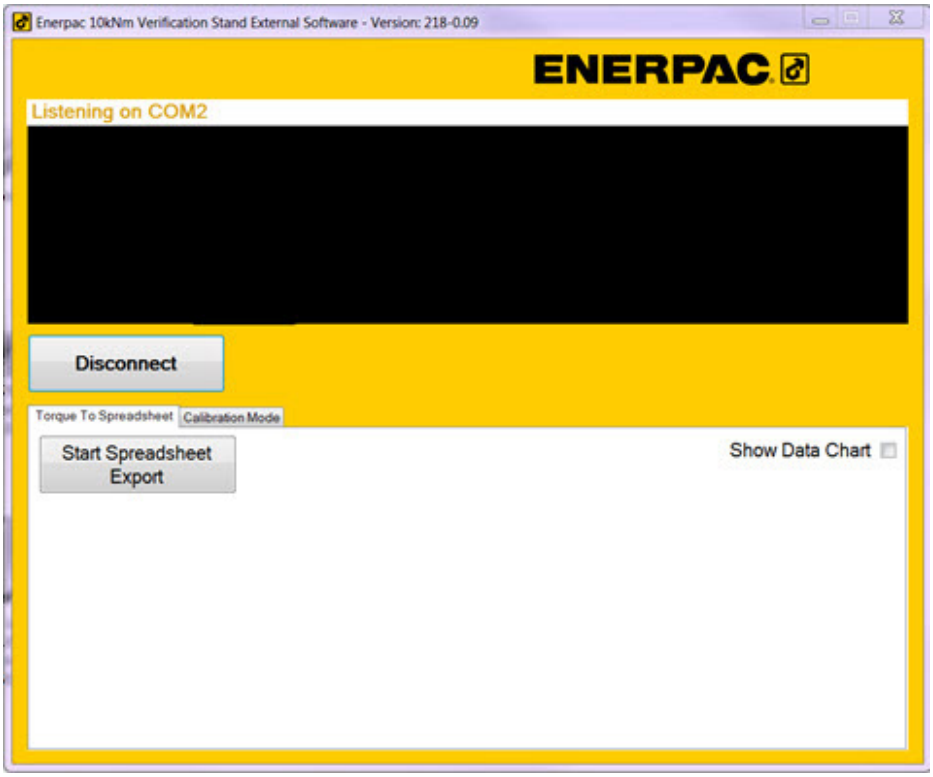


Fig. 19- TTS Display after connecting to PC (PTW)

6. Select the “Calibration Mode” tab. The window will update with fields which are used to specify the number of data points, UUT info etc.:

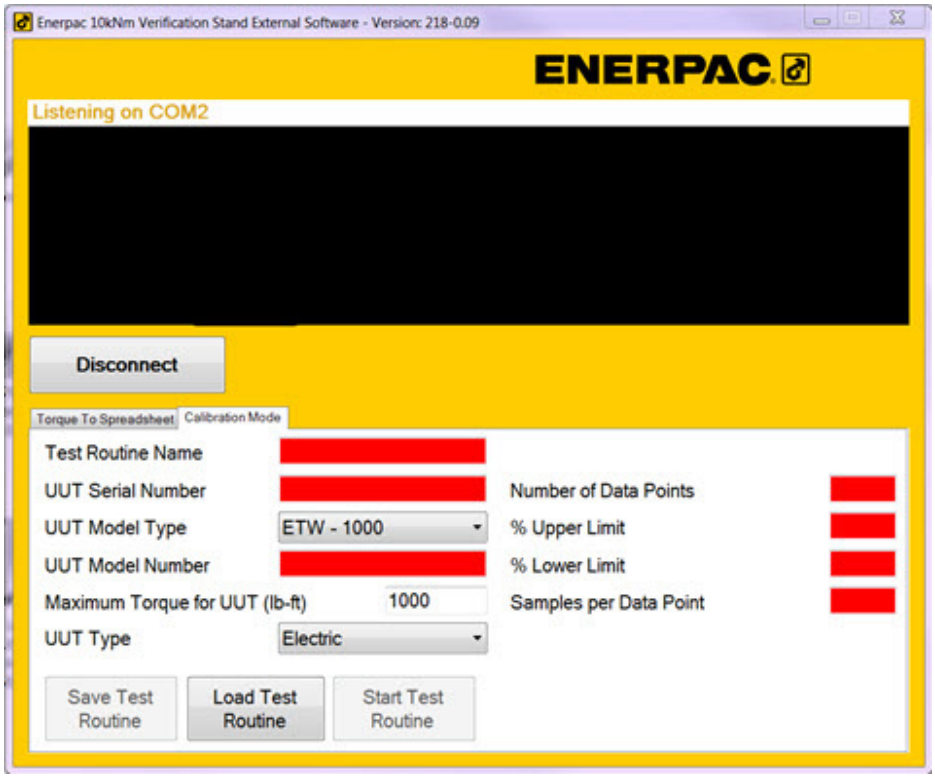


Fig. 20 - Calibration Mode tab (PTW)

7. Enter in all the required information into the text fields. In “UUT Type” drop-down box, select “Pneumatic”. See Figure 21:

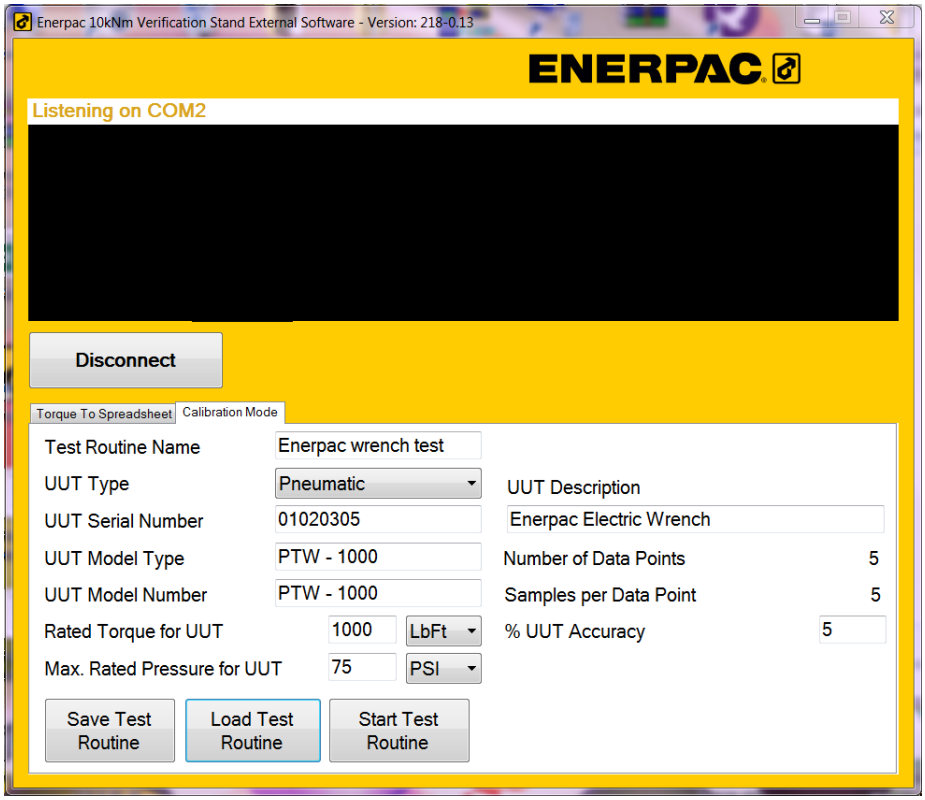


Fig. 21 - Updating Calibration Mode (PTW)

8. Click the “Start test routine” button to start the calibration.

9. A spreadsheet will be created with the specified data points and limits, as set in the previous window.

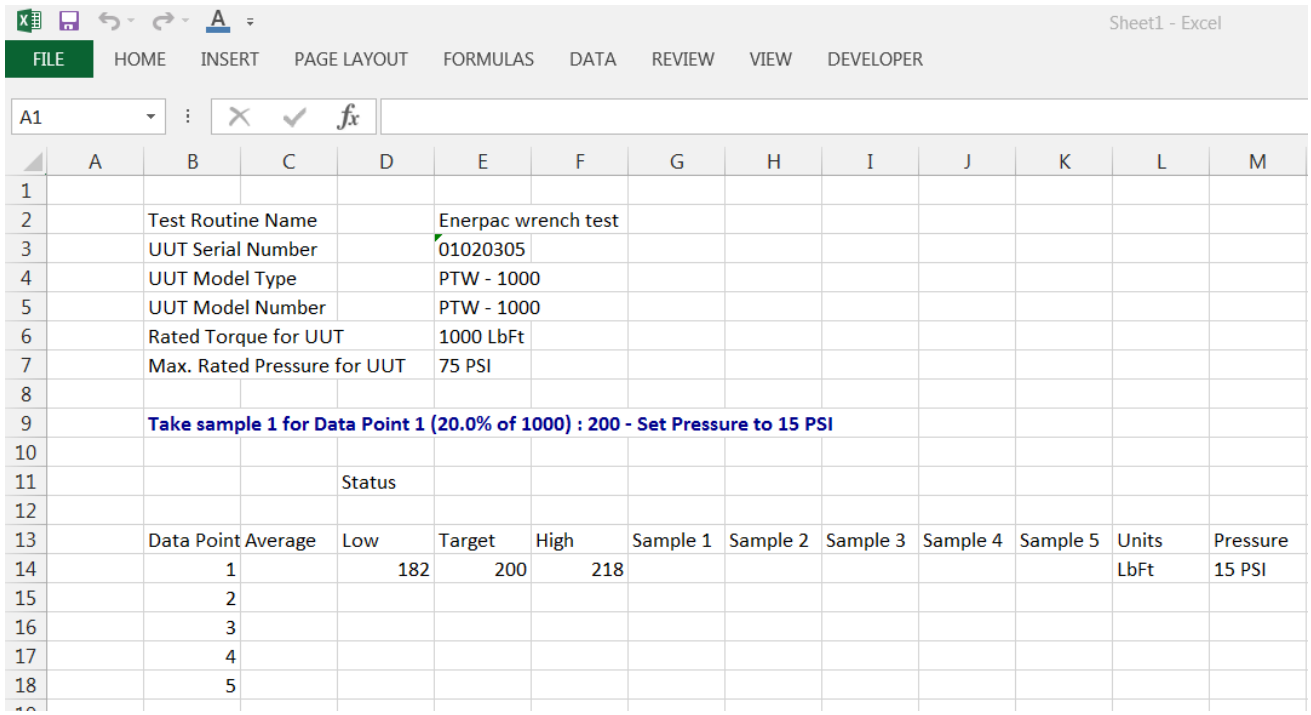
NOTE: Enter Max rated pressure for the UUT from Table A, below; or the tool’s operator manual. See below table for rated pressure vs max torque.

Table A:

Select Torque Unit	Ft.lbs	Rated Pressure (psi)	Nm	Rated Pressure (bar)
PTW-1000	1000	75	1356	5.2
PTW-2000	2000	95	2712	6.6
PTW-3000	3000	75	4067	5.2
PTW-6000	6000	100	8135	6.9

10. Fit wrench to the dynamic joint as specified in section 3.1. Ensure the dynamic joint has been greased before use.

11. Set the target torque on the wrench controller based on the air pressure calculation from the previous step, as specified in blue on the spreadsheet for data point 1. In this case it is 200 Ft.lbs. See Figure 22:



Sheet1 - Excel

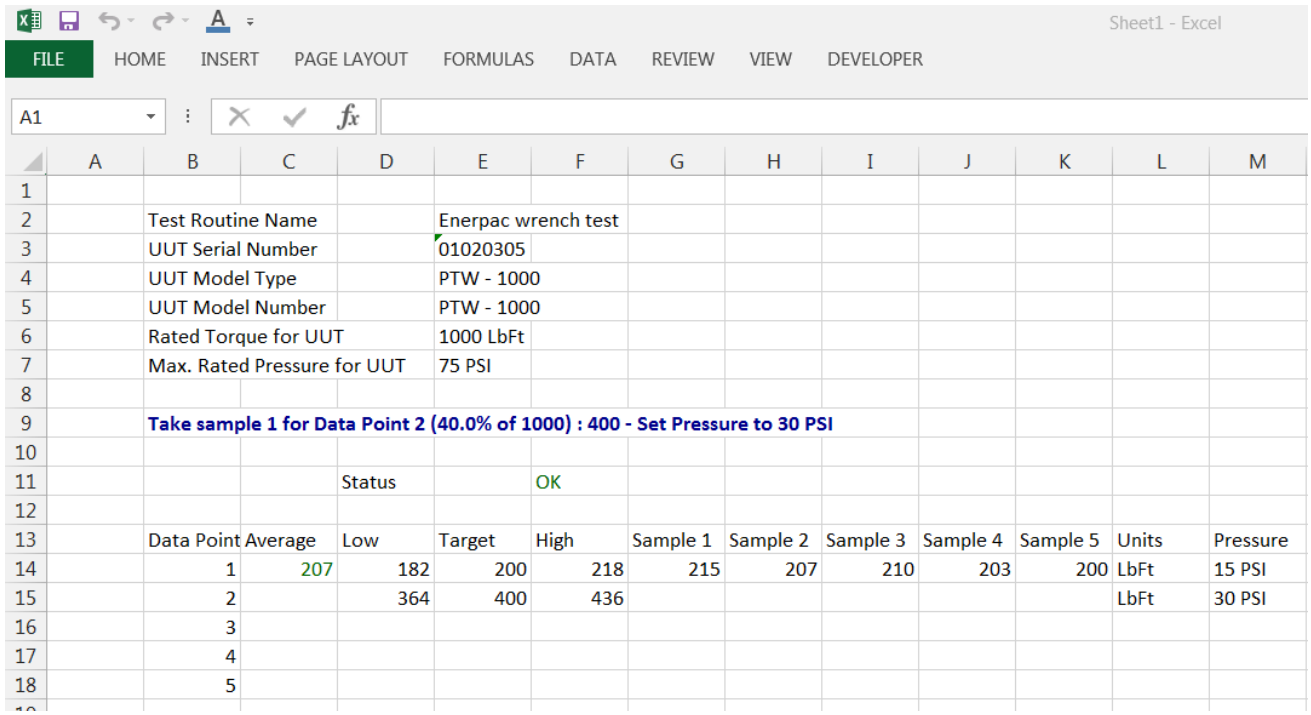
FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW DEVELOPER

A1

	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2		Test Routine Name			Enerpac wrench test								
3		UUT Serial Number			01020305								
4		UUT Model Type			PTW - 1000								
5		UUT Model Number			PTW - 1000								
6		Rated Torque for UUT			1000 LbFt								
7		Max. Rated Pressure for UUT			75 PSI								
8													
9		**Take sample 1 for Data Point 1 (20.0% of 1000) : 200 - Set Pressure to 15 PSI**											
10													
11				Status									
12													
13		Data Point	Average	Low	Target	High	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Units	Pressure
14		1		182	200	218						LbFt	15 PSI
15		2											
16		3											
17		4											
18		5											

Fig. 22- Test Routine Spreadsheet (PTW)

12. Actuate the trigger on the wrench. The dynamic joint fixing will start to rotate and the wrench will shut off when it hits its target torque. Once the cycle has finished, Sample 1 of data point 1 will be populated automatically, with the reading taken during the run down. See Figure 23:



Sheet1 - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW DEVELOPER

A1

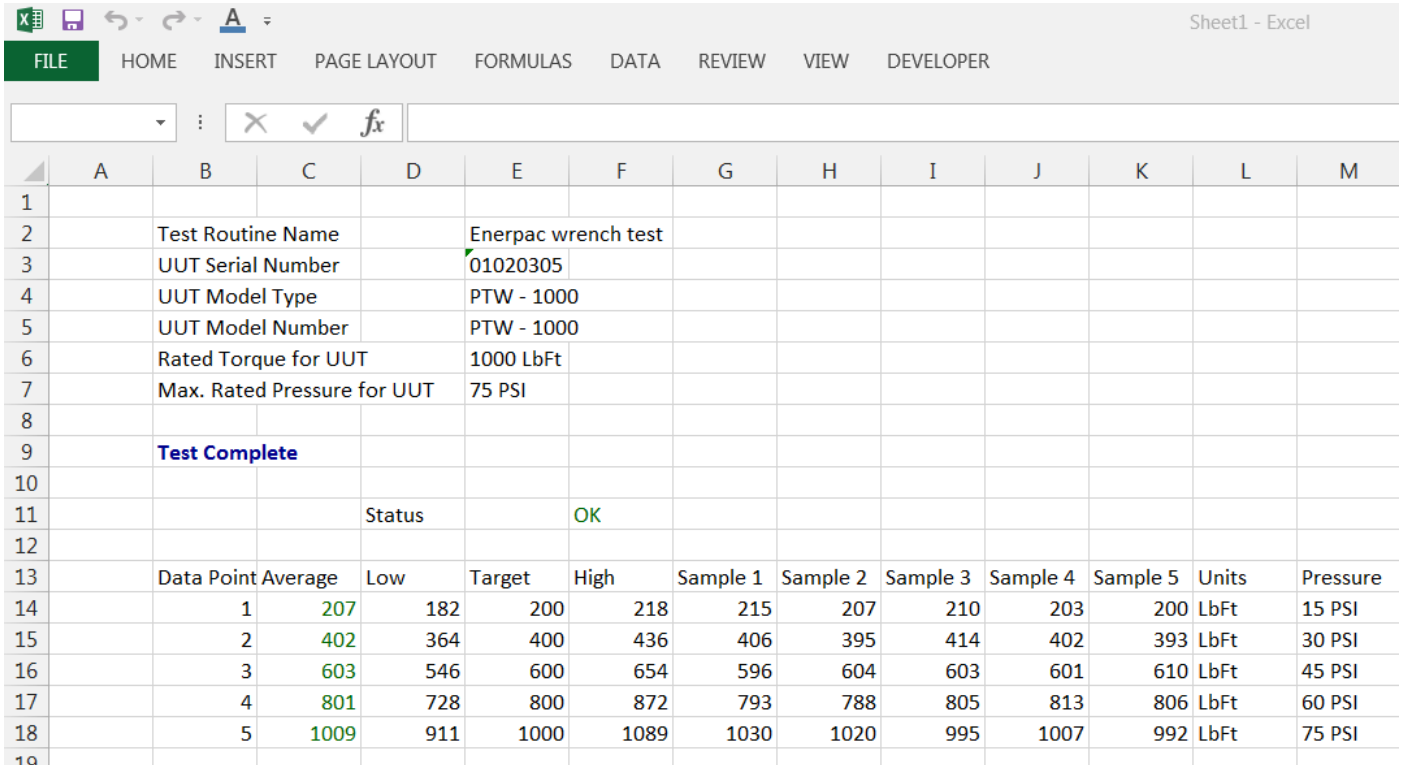
	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2		Test Routine Name			Enerpac wrench test								
3		UUT Serial Number			01020305								
4		UUT Model Type			PTW - 1000								
5		UUT Model Number			PTW - 1000								
6		Rated Torque for UUT			1000 LbFt								
7		Max. Rated Pressure for UUT			75 PSI								
8													
9		**Take sample 1 for Data Point 2 (40.0% of 1000) : 400 - Set Pressure to 30 PSI**											
10													
11				Status		OK							
12													
13		Data Point	Average	Low	Target	High	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Units	Pressure
14		1	207	182	200	218	215	207	210	203	200	LbFt	15 PSI
15		2		364	400	436						LbFt	30 PSI
16		3											
17		4											
18		5											

Fig. 23- Test Routine Spreadsheet in use (PTW)

An average of the readings and status of reading will also be populated into the spreadsheet. The last reading can be cancelled by clicking the “Cancel last sample” button. This may be necessary if the joint was not backed off before the run down or an incorrect target torque was set.

13. Before preforming the second and after every subsequent run down, the dynamic joint **must** be undone by setting the wrench to counter-clockwise and actuating the trigger.

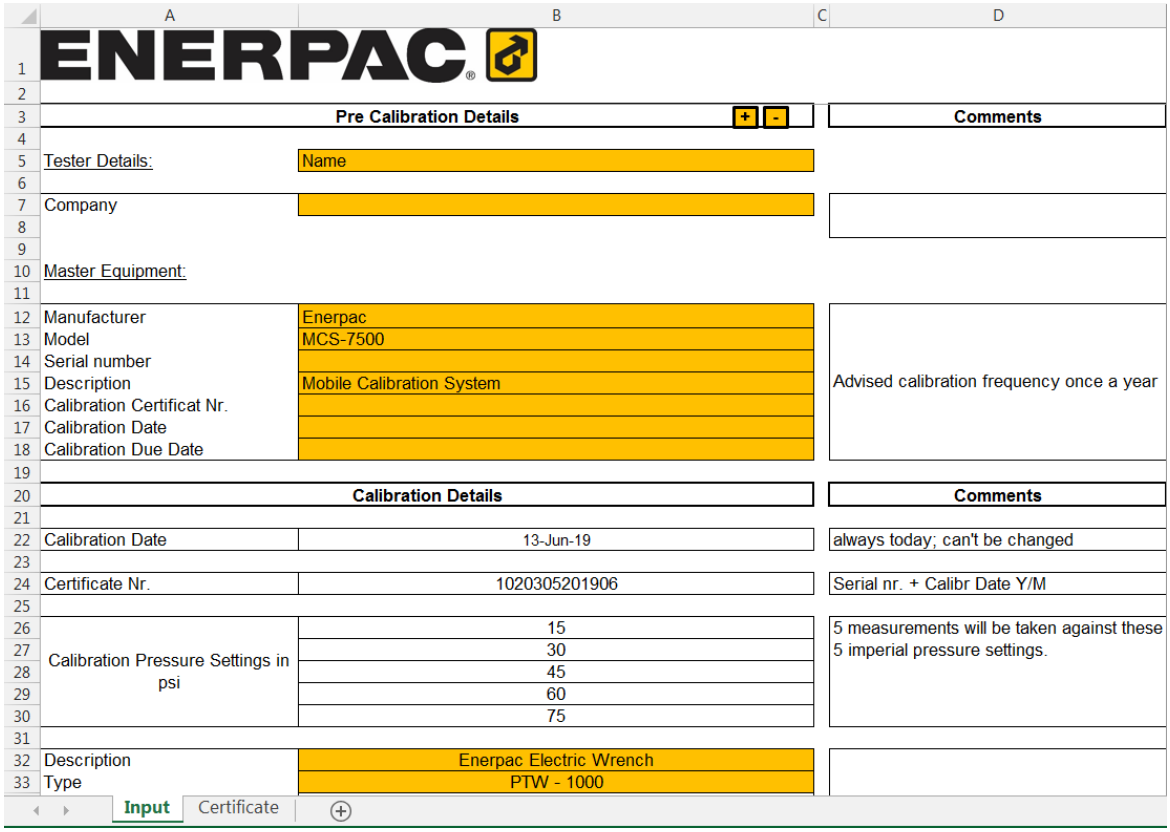
14. Continue performing run downs until all the data point samples have been populated, see Figure 23.:



2	Test Routine Name			Enerpac wrench test								
3	UUT Serial Number			01020305								
4	UUT Model Type			PTW - 1000								
5	UUT Model Number			PTW - 1000								
6	Rated Torque for UUT			1000 LbFt								
7	Max. Rated Pressure for UUT			75 PSI								
9	**Test Complete**											
11			Status		OK							
13	Data Point	Average	Low	Target	High	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Units	Pressure
14	1	207	182	200	218	215	207	210	203	200	LbFt	15 PSI
15	2	402	364	400	436	406	395	414	402	393	LbFt	30 PSI
16	3	603	546	600	654	596	604	603	601	610	LbFt	45 PSI
17	4	801	728	800	872	793	788	805	813	806	LbFt	60 PSI
18	5	1009	911	1000	1089	1030	1020	995	1007	992	LbFt	75 PSI

Fig. 23- Completed Test Routine Spreadsheet (PTW)

15. On the main Enerpac VSES program, click the “Export to pdf” button to create the certificate. The program will create a spreadsheet with an input tab and a certificate tab, at the bottom of the spreadsheet:



	A	B	C	D
1	ENERPAC			
2				
3	**Pre Calibration Details**			**Comments**
4				
5	Tester Details:	Name		
6				
7	Company			
8				
9				
10	Master Equipment:			
11				
12	Manufacturer	Enerpac		
13	Model	MCS-7500		
14	Serial number			
15	Description	Mobile Calibration System		Advised calibration frequency once a year
16	Calibration Certificat Nr.			
17	Calibration Date			
18	Calibration Due Date			
19				
20	**Calibration Details**			**Comments**
21				
22	Calibration Date	13-Jun-19		always today; can't be changed
23				
24	Certificate Nr.	1020305201906		Serial nr. + Calibr Date Y/M
25				
26	Calibration Pressure Settings in psi	15		5 measurements will be taken against these 5 imperial pressure settings.
27		30		
28		45		
29		60		
30		75		
31				
32	Description	Enerpac Electric Wrench		
33	Type	PTW - 1000		

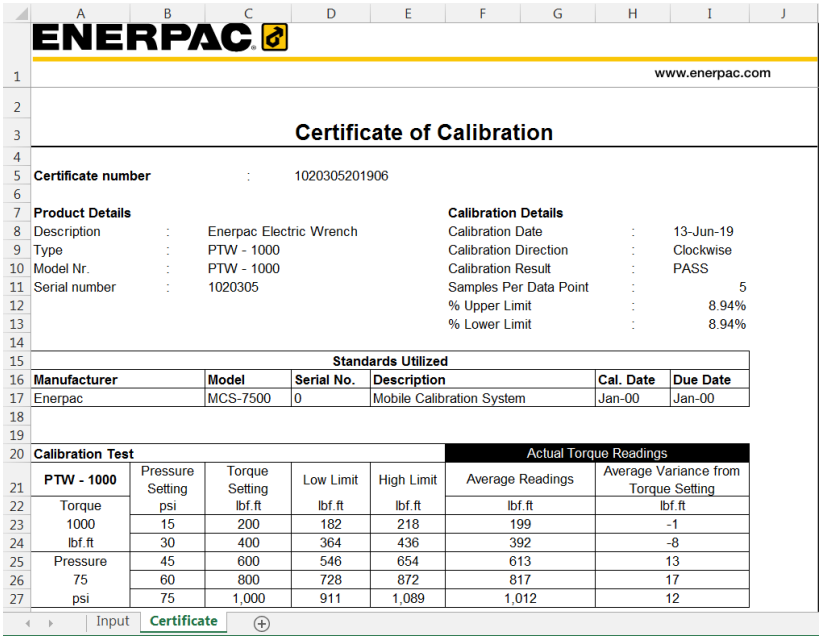
Input | Certificate

Fig. 24- Calibration Certificate Input Sheet (PTW)

Fill in the unpopulated fields with the relevant information.

NOTE: Master equipment is the MCS7500C verification stand details. Calibration certificate number and calibration/due dates can be obtained from the original calibration certificate supplied with the unit.

16. Select the certificate tab to view the calibration certificate.



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Certificate of Calibration

Certificate number : 1020305201906

Product Details			**Calibration Details**		
Description	:	Enerpac Electric Wrench	Calibration Date	:	13-Jun-19
Type	:	PTW - 1000	Calibration Direction	:	Clockwise
Model Nr.	:	PTW - 1000	Calibration Result	:	PASS
Serial number	:	1020305	Samples Per Data Point	:	5
			% Upper Limit	:	8.94%
			% Lower Limit	:	8.94%

Standards Utilized

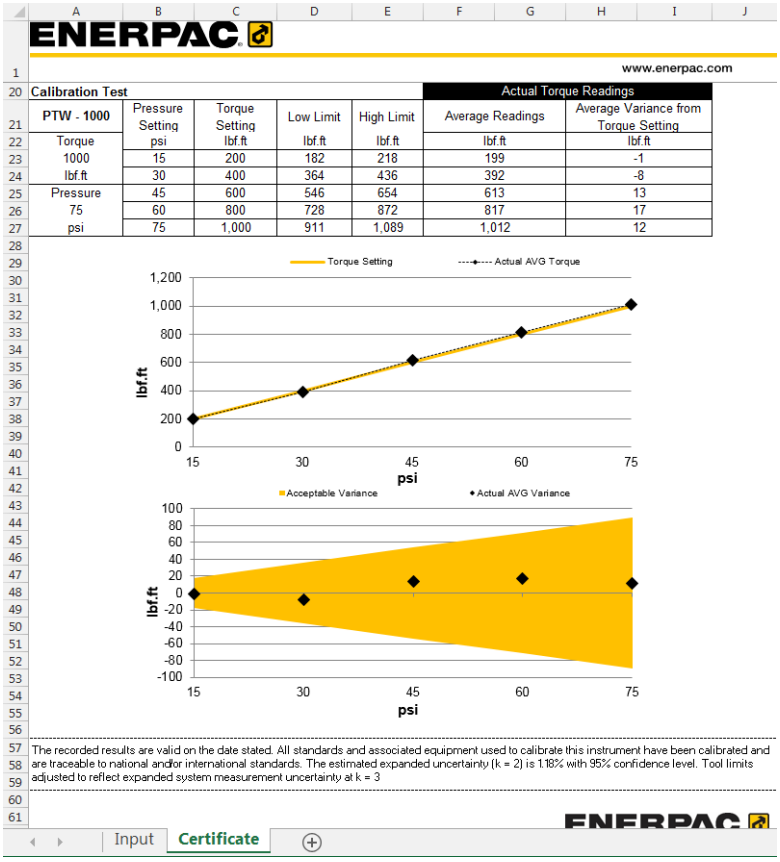
Manufacturer	Model	Serial No.	Description	Cal. Date	Due Date
Enerpac	MCS-7500	0	Mobile Calibration System	Jan-00	Jan-00

Calibration Test					Actual Torque Readings	
PTW - 1000	Pressure Setting	Torque Setting	Low Limit	High Limit	Average Readings	Average Variance from Torque Setting
Torque	psi	lbf.ft	lbf.ft	lbf.ft	lbf.ft	lbf.ft
1000	15	200	182	218	199	-1
lbf.ft	30	400	364	436	392	-8
Pressure	45	600	546	654	613	13
75	60	800	728	872	817	17
psi	75	1,000	911	1,089	1,012	12

Input | Certificate

Fig. 25- Calibration Certificate tab (PTW)

Calibration result, readings taken and a graph to show torque vs air pressure in psi/ Ft.lbs and bar/Nm.



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Calibration Test					Actual Torque Readings	
PTW - 1000	Pressure Setting	Torque Setting	Low Limit	High Limit	Average Readings	Average Variance from Torque Setting
Torque	psi	lbf.ft	lbf.ft	lbf.ft	lbf.ft	lbf.ft
1000	15	200	182	218	199	-1
lbf.ft	30	400	364	436	392	-8
Pressure	45	600	546	654	613	13
75	60	800	728	872	817	17
psi	75	1,000	911	1,089	1,012	12

The recorded results are valid on the date stated. All standards and associated equipment used to calibrate this instrument have been calibrated and are traceable to national and/or international standards. The estimated expanded uncertainty (k = 2) is 1.18% with 95% confidence level. Tool limits adjusted to reflect expanded system measurement uncertainty at k = 3

ENERPAC

Input | Certificate

Fig. 26- Completed Calibration Certificate (PTW)

A copy can be printed, by selecting File, Print, and/or a copy can be saved to any preferred directory by selecting File, Save as and selecting the directory in which the copy needs to be saved.

5.0 DIGITAL DISPLAY MODULE

5.1 Digital Display Buttons

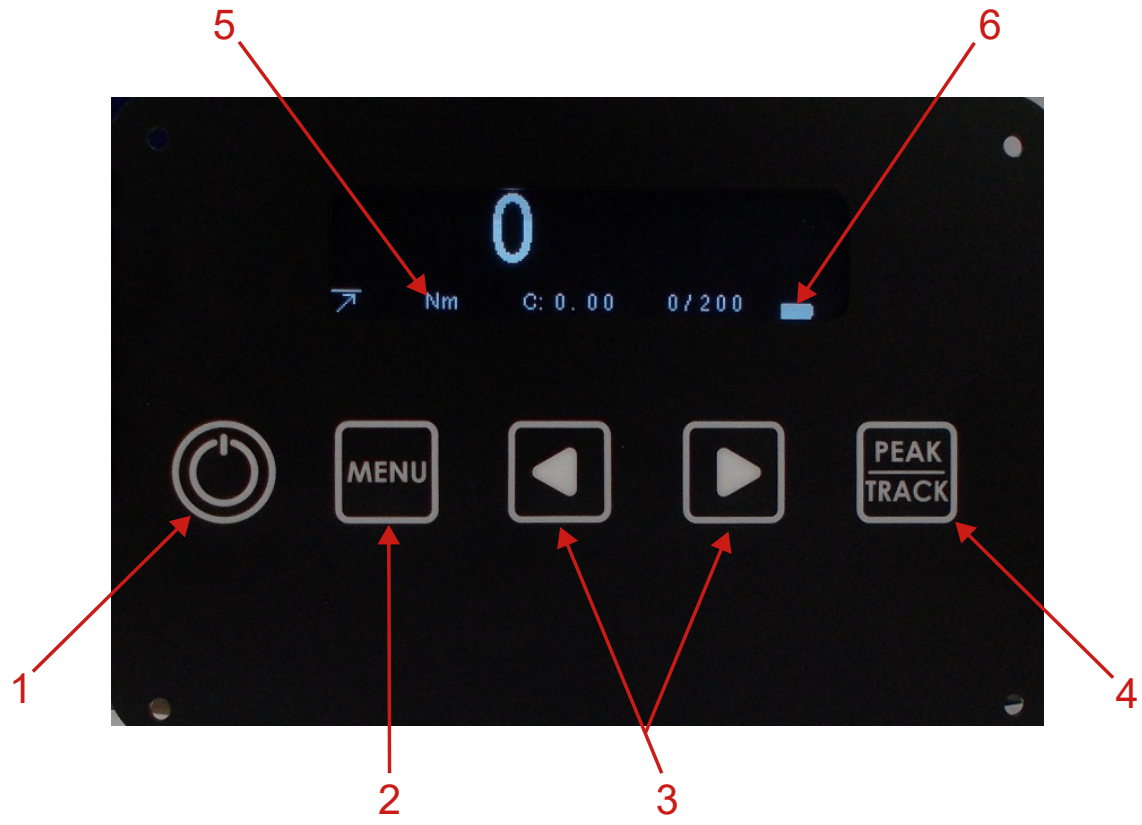


Fig. 27 - Digital Display Buttons

1. Power key – Turns the display On and Off and zeros the transducer.
2. Menu – Accesses Torque units and Filter settings.
3. Left and Right keys – Navigate through the menu and allows access to stored readings.
4. Peak/Track – Selects measurement mode.

5.2 Digital Display Window

5. The torque value, mode of operation, engineering units, No. of stored readings are displayed in the digital display window.

NOTE: The default settings are Peak and Ft.lbs.

5.3 Battery Indicator

6. There is a battery symbol on the bottom right hand side of the display, showing battery level and charge status. For battery recharging information, see Section 1.3.4.

The low-battery indicator on the display module will show an empty battery symbol, in the bottom right hand side of the display when the battery voltage is low. Typically, the user will have between 15-30 minutes before the batteries become too weak to power the calibration unit.

5.4 Mode of Operation

The current mode of operation (peak or track) is displayed. Press the Peak/Track button to toggle through these modes (see Figure 15).

Peak

The peak mode displays and retains the maximum torque experienced by the wrench, as occurs when operating the wrench in the tightening direction. The peak mode is recommended for rotary tools and wrenches.

Track

The track mode displays the torque as it is being applied to the transducer. This mode is used primarily for verifying the calibration of the MCS7500C unit.

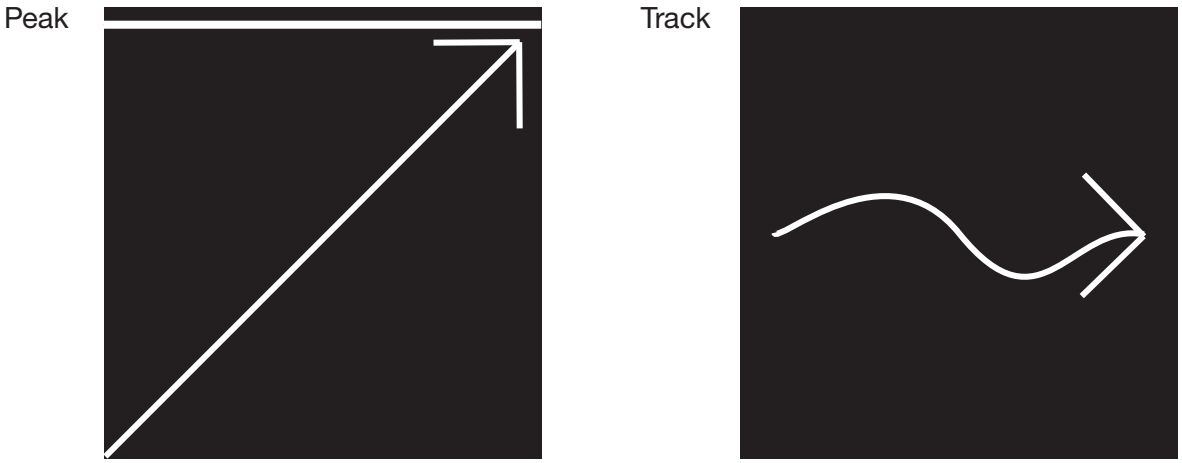


Fig. 28 - Peak/ Track functions as shown on unit display

5.5 Engineering Units

The current engineering units. Press the Menu button and press the left and right arrow keys to scroll through units: Nm and Ft.lbs. (see Figure 15)

Fig. 29 - Engineering Units

5.6 Filter

Use this option to select the filter value.

Press the Menu button twice and using the arrow keys, select the required Filter. Selectable filter values in Hz (125, 250, 500, 1000, 2000, 4000 and 5000).

The filter is used to reduce mechanical noise when used with impulse type tools. Current ISO standards recommend 500Hz for general use.

Fig. 30 - Filter Display

Unit can store up to 200 readings on board and uses “Fifo”. Readings will be cleared on power cycle.

6.0 MAINTENANCE

The MCS7500C Calibration System requires very little maintenance, but periodic lubrication of the run down fixture is critical to the longevity of the tool. The run down bolt and disc spring should be periodically removed and inspected, and if necessary, coated with a high pressure anti-seize lubricant.

Enerpac recommends Molybdenum Disulfide, or a lubricant with similar properties. After proper lubrication, replace the run down disc spring. Some units have an additional disc springs installed.

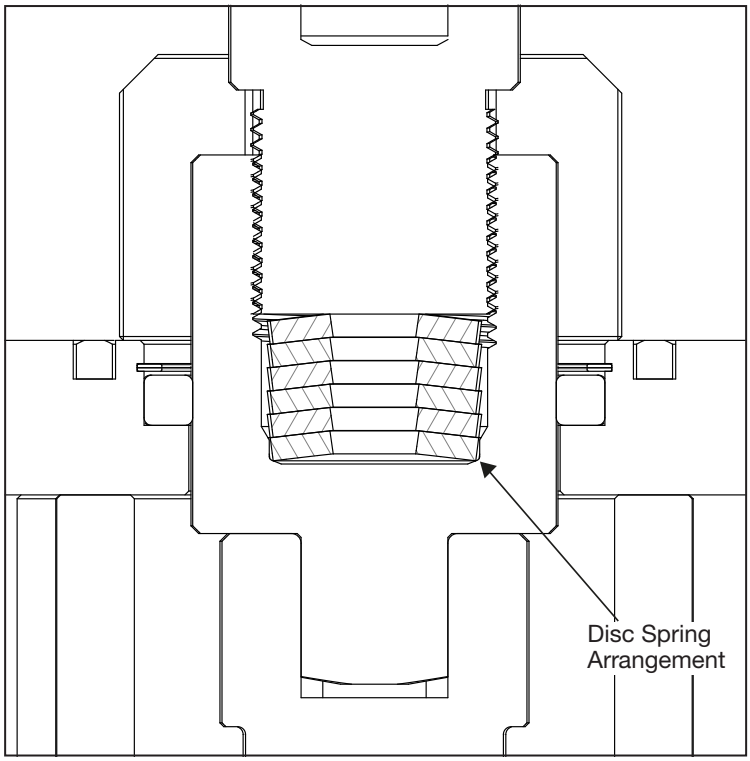


Fig. 30 - Disc Spring Placement

7.0 RECALIBRATION

The MCS7500C is calibrated in a laboratory which is compliant to ISO17025. The unit is calibrated in the clockwise direction where 6 points of measurements are taken in ascending order (5%, 20%, 50%, 75%, and 100%).

It is recommended that the unit is recalibrated every 12 months or 500 operations, whichever is sooner.

The accuracy of the MCS7500C is calibrated to meet or exceed: 1% of FSD from 2% to 8% of torque range and 1% of reading from 8% to 100% of torque range.

For service and recalibration, please contact the following service centres:

Enerpac ESSA:
www.enerpac.com/en-gb/distributors

Enerpac USA:
www.enerpac.com/en-us/distributors

Enerpac Southeast Asia:
https://www.enerpac.com/en-sg/distributors

Enerpac Australia
https://www.enerpac.com/en-au/distributors

8.0 TROUBLESHOOTING

8.1 Digital Display

Symptom	Remedy
Digital module will not turn on.	Plug unit into charger/power supply. Let unit charge for 30 minutes before attempting to turn on. Digital display should be connected to power source for 4 hours to fully charge the battery.
No readings on digital display.	Check direction of tool is set to RH (Clockwise). Ensure the target torque setting on the tool is above 100Nm (73.8Ft. lbs)
Torque readings are dramatically lower or higher than expected.	Verify that the display is operating in the desired engineering units. Check that the filter setting is suitable for the application and the tool. Inspect transducer for overload/yield by selecting track mode on the display. If there is a large value displayed with no strain on the transducer the transducer has been over loaded and requires service.

8.2 Joint Run Down

Symptom	Remedy
Threaded components do not rotate freely.	Disassemble, clean, and inspect threaded components. If threads are not damaged lubricate and reassemble.

8.3 Repair and (Re)Calibration

All (re-)calibrations and all repairs on the Enerpac MCS7500C calibration stands will be handled by Enerpac Authorized Service Centers.

ESSA:
The nearest Enerpac Authorized Service Center can be found at:
https://www.enerpac.com/en-gb/distributors

USA
The nearest Enerpac Authorized Service Center can be found at:
https://www.enerpac.com/en-us/distributors

Southeast Asia:
The nearest Enerpac Authorized Service Center can be found at:
https://www.enerpac.com/en-sg/distributors

Australia
The nearest Enerpac Authorized Service Center can be found at:
https://www.enerpac.com/en-au/distributors

9.0 TECHNICAL SPECIFICATIONS

Dimensions	Width: 12" [30.5 cm], Height: 12.8" [32.5 cm], Length: 11" [27.9 cm], Weight: 50 Lbs [23 kg].
Power Requirements	Unit will have an internal rechargeable Li-Ion battery pack. External power for charging will be supplied via a 5V DC USB power supply Unit will meet IP51. (Limited protection against dust ingress. Protected against vertically falling drops of water or condensation.) USB Data output is a requirement via USB type B connector.
Operating Temperature Range	32°F [0°C] to 122°F [50°C].
Data Communications	USB
Accuracy	The accuracy of the MCS7500C is calibrated to meet or exceed: 1% of FSD from 2% to 8% of torque range and 1% of reading from 8% to 100% of torque range.
Range	2% to 100% [148 Ft.lbs to 7375 Ft.lbs (200Nm to 10,000NM)].
Filter	Selectable Hz filter: 125, 250, 500, 1000, 1500, and 2000.

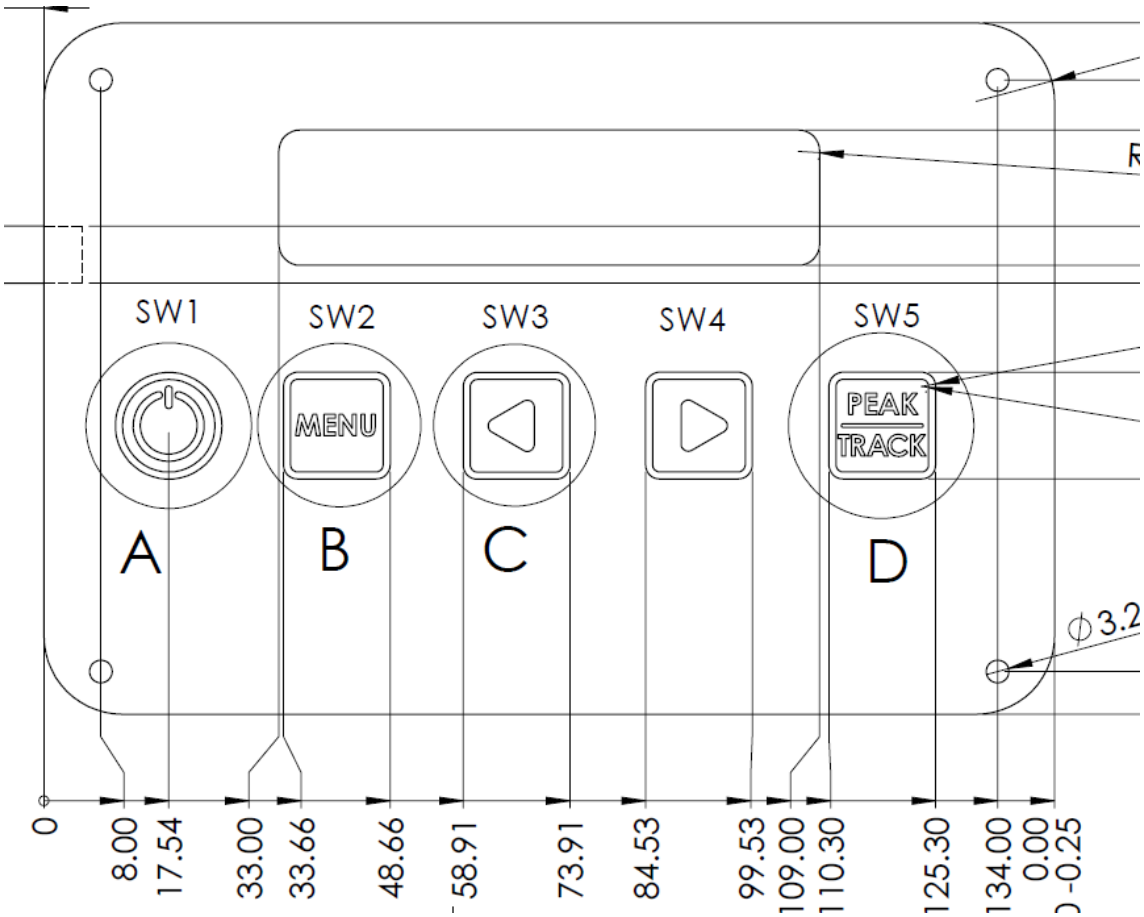
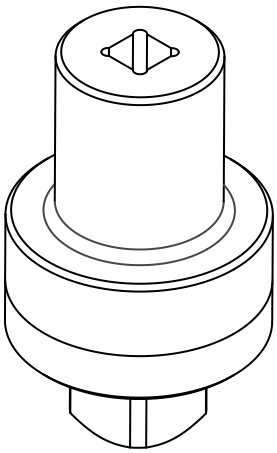
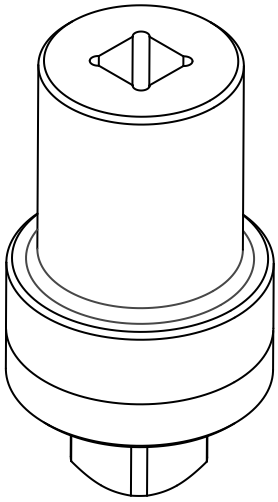


Fig. 24 -General arrangement drawing with key dimensions

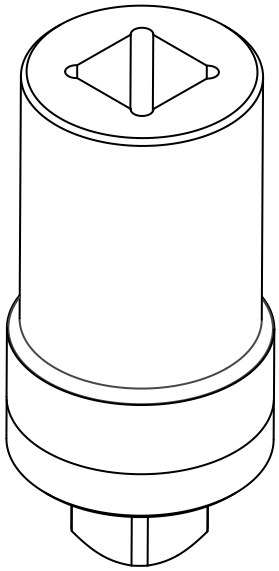
10.0 MCS7500C ADAPTORS & REACTION BLOCK



DM0396038

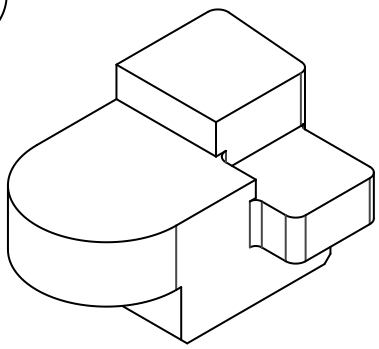


DM0397038



DM0398038

Not included with MCS7500C. Enerpac does not offer this reaction block and the adaptors as finished products. Instead, production drawings are available upon request.

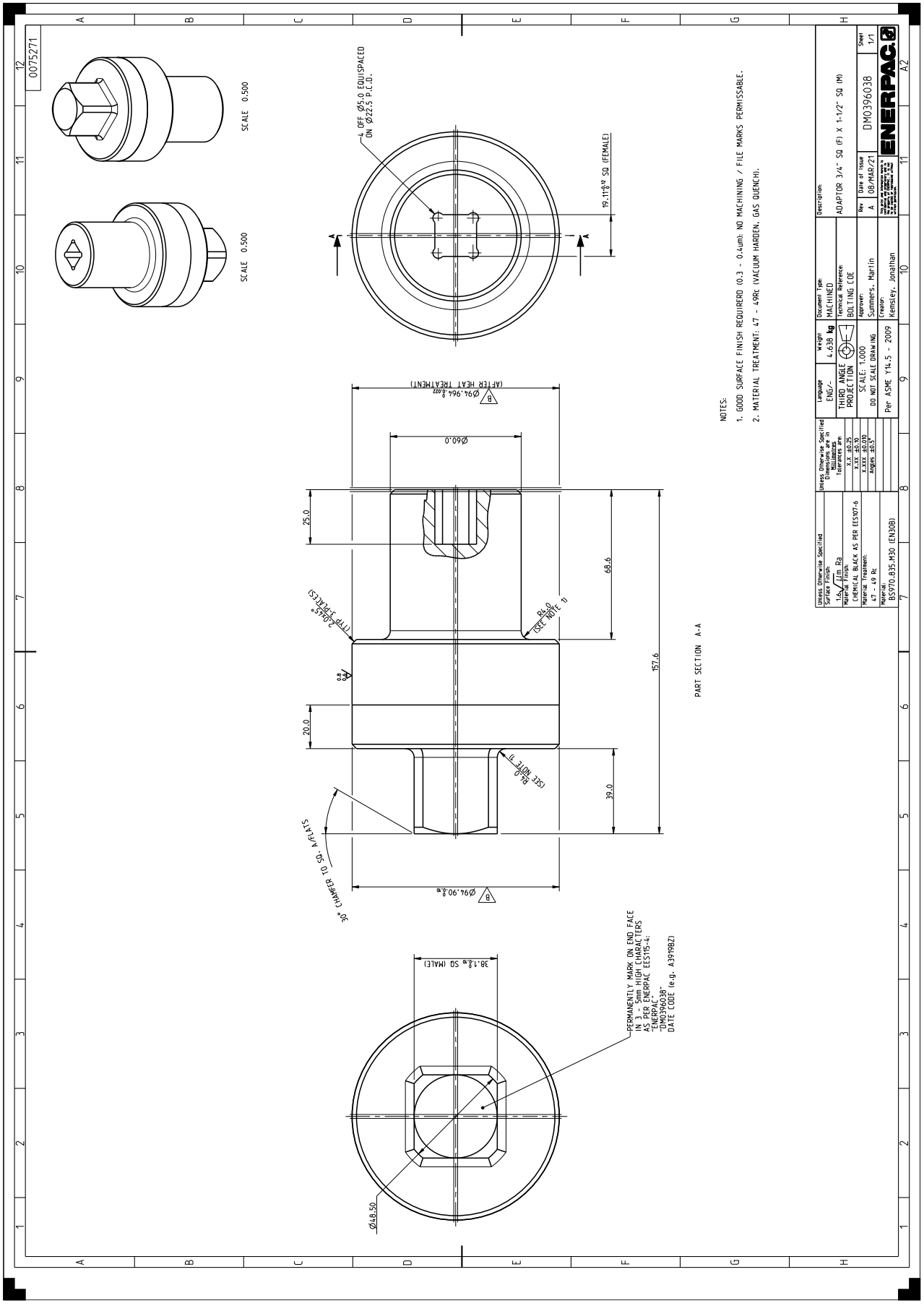


DM0404112

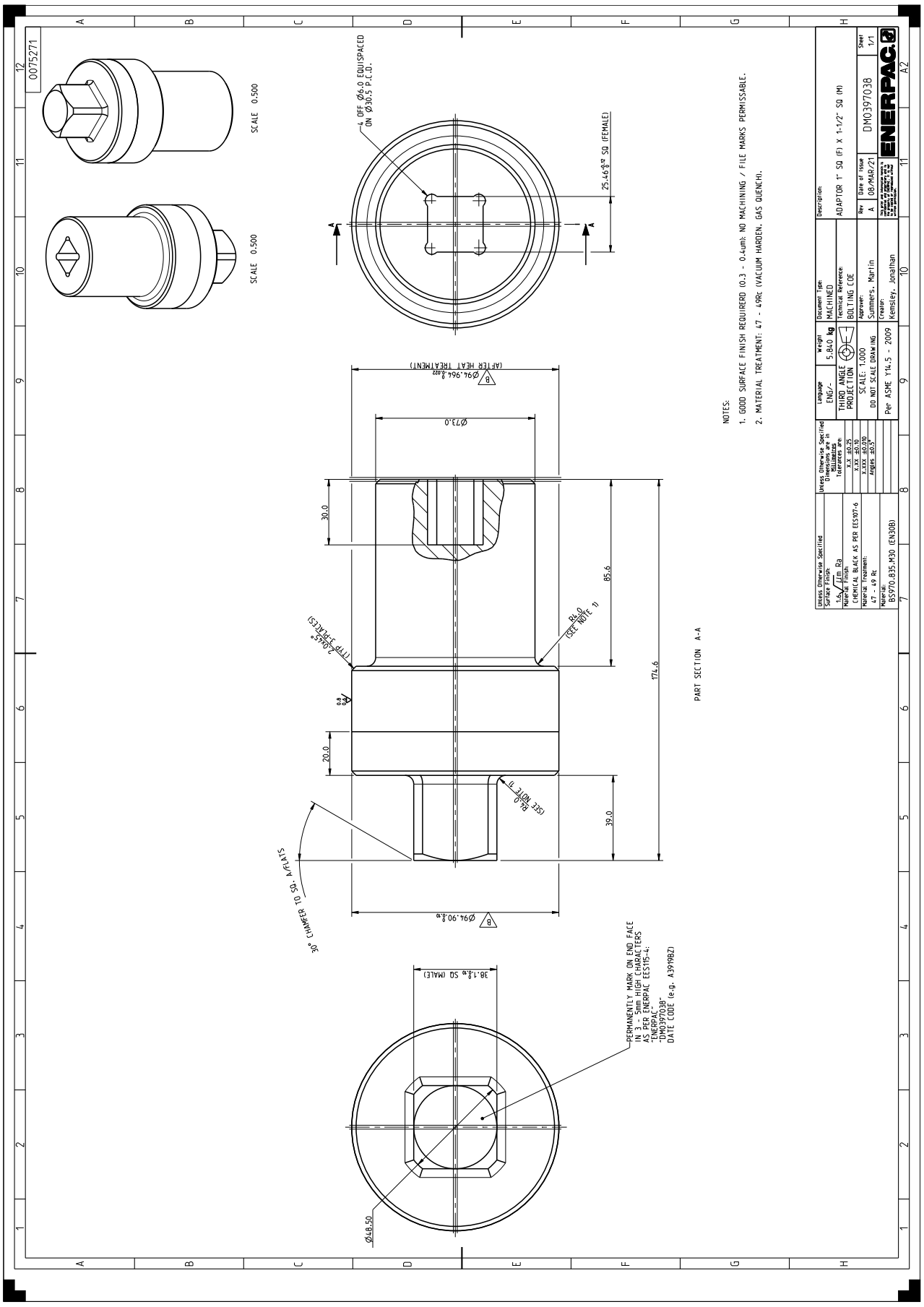
Fig. 25-Adaptors and Reaction Block

Part Number	Description	Tools to be used with
DM0396038	Adaptor 3/4" SQ (F) X 1-1/2" SQ (M)	S1500X RSL1500/RSQ1500 combination
DM0397038	Adaptor 1" SQ (F) X 1-1/2" SQ (M)	S3000X RSL3000/RSQ3000 combination
DM0398038	Adaptor 1-1/2" SQ (F) X 1-1/2" SQ (M)	S6000X RSL5000/RSQ5000 combination
DM0404112	REACTION BLOCK	All List Tools

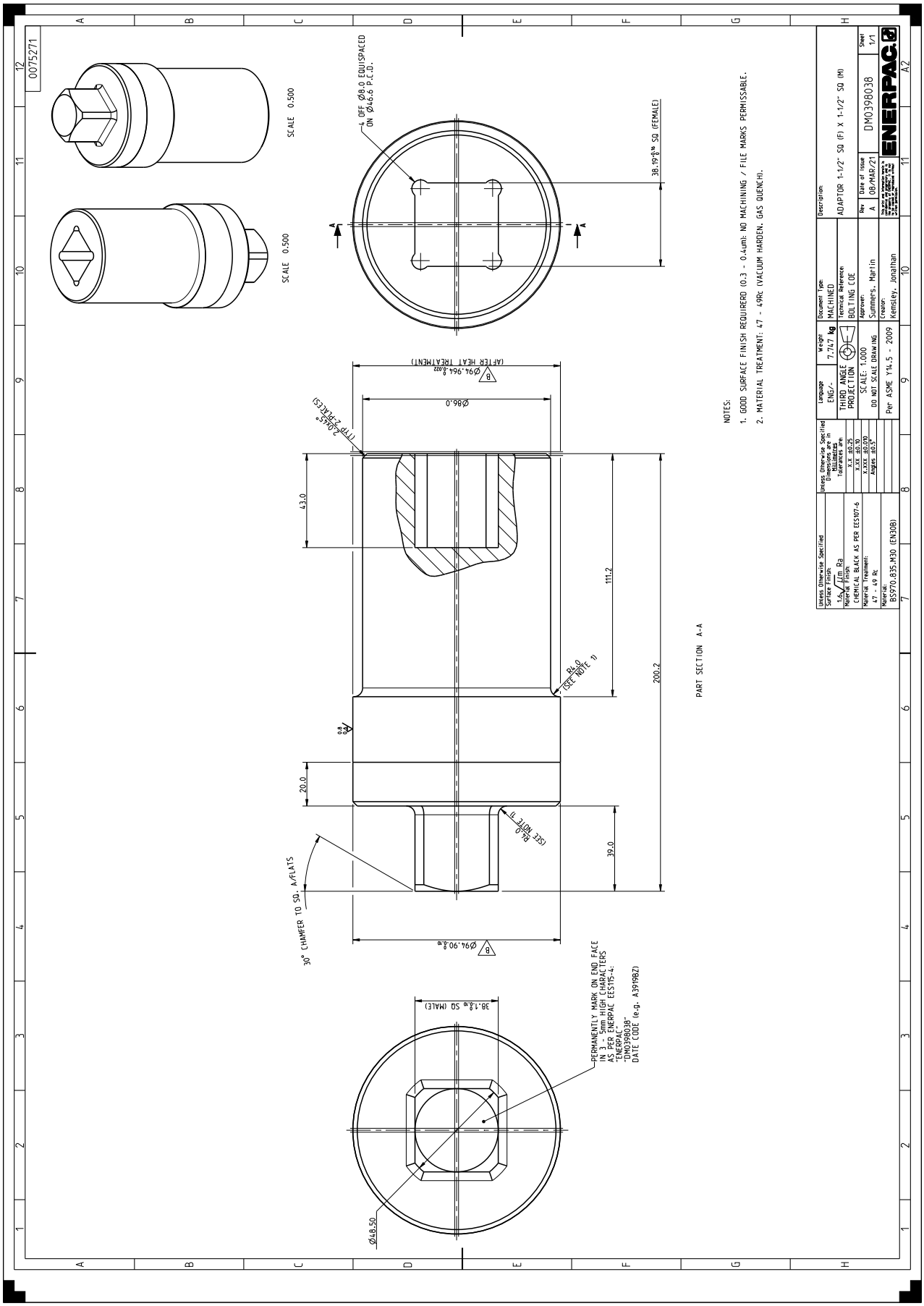
10.1 Schematic - DM0396038



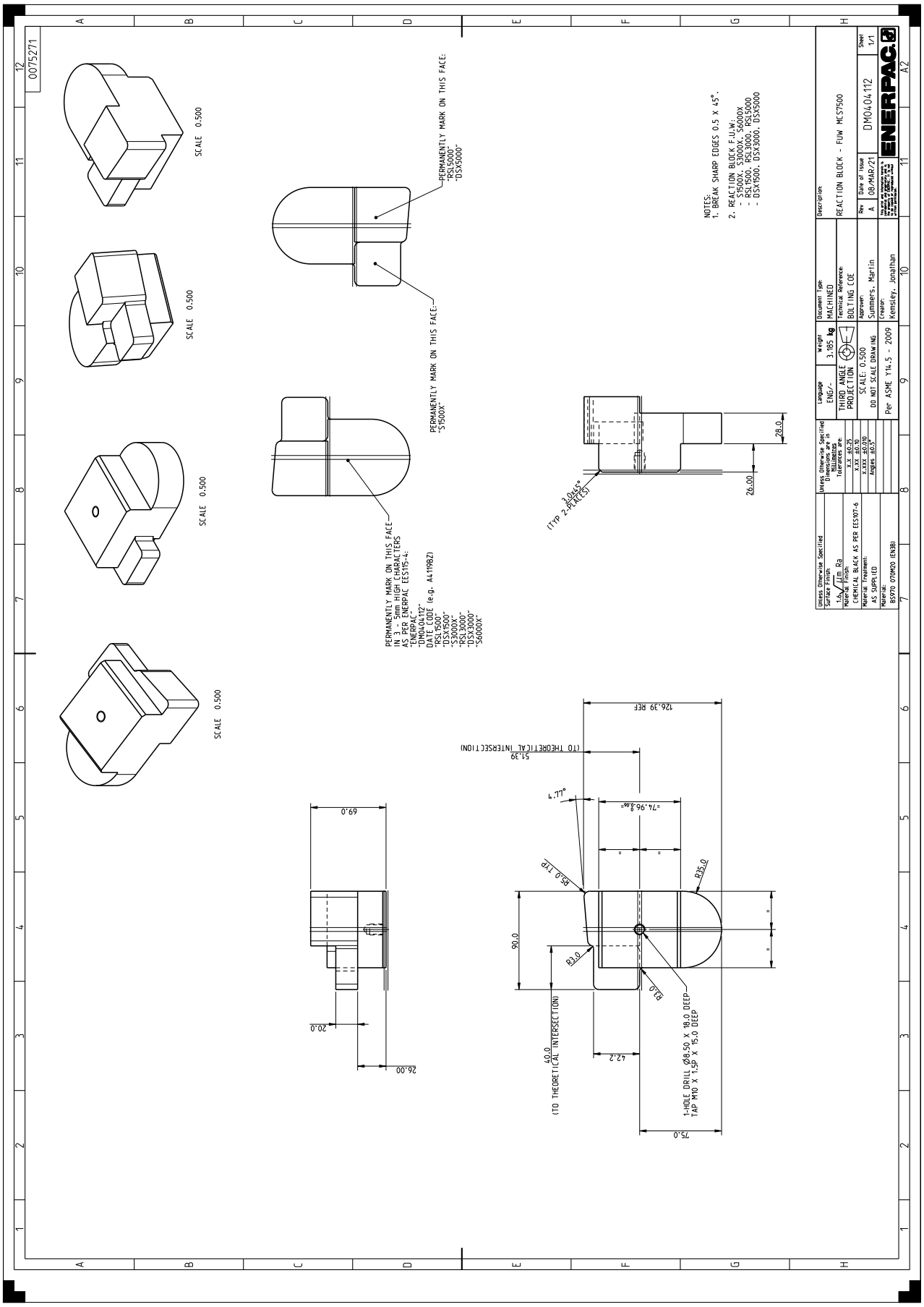
10.2 Schematic - DM0397038



10.3 Schematic - DM0398038



10.4 Schematic - DM0404112



NOTES

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