OPERATING INSTRUCTIONS

Superpave Gyratory Compactor

45-6750

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Contents

1. Document Overview

This manual contains comprehensive information about the operation and maintenance of the Superpave Gyratory Compactor EN.

Please take the time to read this manual as it contains information on the installation, maintenance and use of the Gyratory Compactor.

This manual is aimed at general users of the Gyratory Compactor, including Laboratory Technicians, Maintenance Technicians and Technical Users.

This manual should be strictly observed. ELE International accepts no liability for damage caused by disregarding the information contained in this manual or other related documents.

Glossary of Terms, Abbreviations and Definitions

Abbreviations	Description
EN	European Norm
kPa	Kilo Pascal
cfm	Cubic Feet/Min.
mm	Millimetres
Hmin(mm)	Defined in the Standard
mPa	Mega Pascal

Typographical Conventions

Icon	Description
	This icon denotes a caution, which advises you of precautions to take to avoid injury to equipment or loss of data.
	This icon denotes a note, which alerts you to important information, further information in this document or other sources such as manuals, data sheets, literature etc.
Bold	Bold text indicates a reference to a physical or software control, or a user interface screen.

2. Product Overview

This section provides an overview of the Superpave Gyratory Compactor.

2.1 General Description

The Superpave Gyratory Compactor is specifically designed to meet the EN and AASHTO requirements (see section 5.3), be high quality and user friendly.

The Gyratory Compactor motion is generated with a precise eccentric which is factory calibrated to 0.82^{o}+/-0.02^{o} (note: the Gyratory Compactor can be set to achieve angles outside of this range). Speed of the Gyratory Compactor is accurately controlled with an inverter and is accurate to greater than 0.5 rpm.

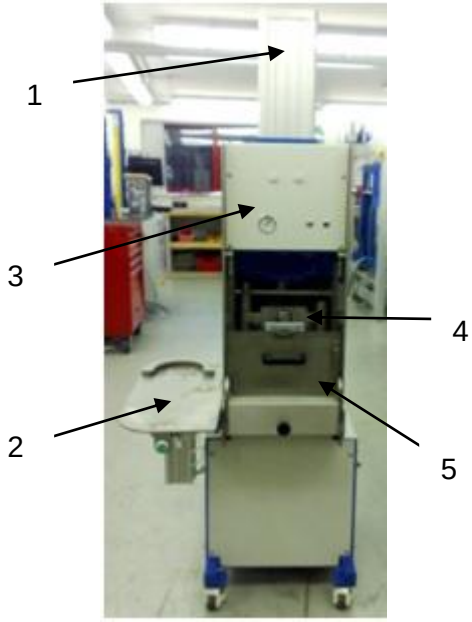
Load is applied with a 160mm diameter pneumatic cylinder and each compaction load controlled with a pressure regulator. The pneumatics has a switchable pressure so that 600kPa can be achieved for both 100mm and 150mm specimens. The specimen height is measured with a 250mm stroke linear transducer.

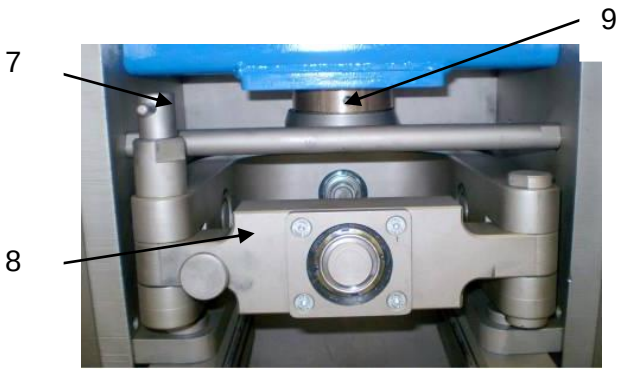
Test software allows the user to select compaction methods based on achieving a target density, or specified number of gyrations. The number of gyrations, compaction depth and density are logged to disc and displayed on screen. Percentage void content is calculated and displayed on screen.

The desktop PC is connected to the gyro through a high speed Ethernet connection.

Emulsion mixtures can be compacted using perforated moulds.

2.2 Machine Elements

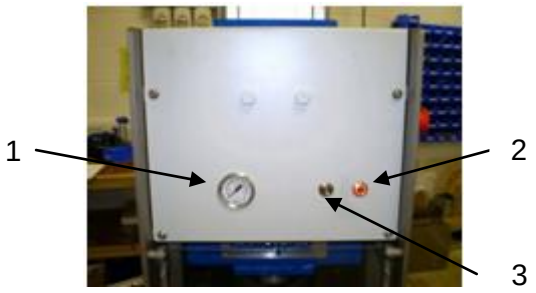




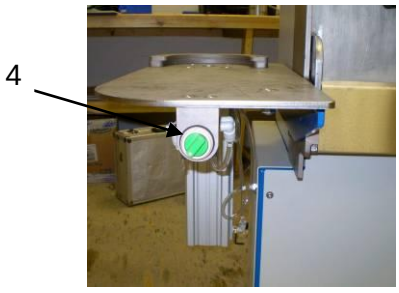
Part No.	Part Description	Quantity
1	Main Actuator	1
2	Mould Extruder	1
3	Front Control Panel	1
4	Top Safety Door	1
5	Bottom Safety Door	1
6	Air Inlet Regulator	1
7	Mould Retaining Bar Locking Pin	1
8	Mould Retaining Bar	1
9	Main Ram	1

2.3 Controls

Front Panel

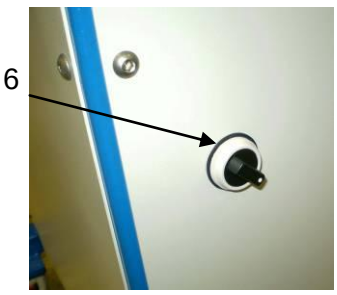


Mould Extractor

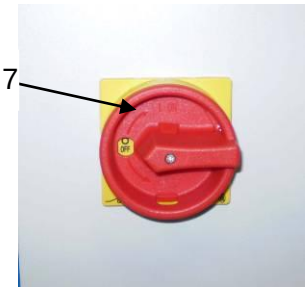


Right hand side

Right hand side



Back panel



Part No.	Part Description
1	Air pressure gauge
2	Safety reset button
3	Power on/off button
4	Mould extractor raise/lower switch
5	**EMERGENCY STOP** push button
6	Pressure regulator switch
7	Main isolator

2.4 Unit Specification

Specification	
Voltage	Single phase 220-240VAC 50/60Hz
Current	Fuse at 13A
Power	3KVA
Operational temperature	5^{o}C to 40^{o}C
Transport and storage	-40^{o}C to 70^{o}C
Humidity	10% to 90% (with no condensation) Assumes dry air supply
Size	780 x 1000 x 1920mm
Weight	508kg

3. Installation

This section describes the basic tasks that must be carried out when the machine is first installed, moved to a new location or if the software needs to be installed.

3.1 Location

The machine should be located in a dry and adequately ventilated room. To ensure efficient operation, it must not be placed in direct sunlight or against heat-emitting surfaces. The machine should be conveniently located to allow access all around.

Warning: be aware that cables may be stretched across the path when moving items around. To avoid hazards of this type, place a mat or a cable cover over the wire and tubing.

3.2 Electrical Supply

Warning: the following operations should only be carried out by suitable qualified staff.

The machine requires a 220-240V A.C. 50/60Hz supply, protected at 13A.

The detachable cord supplied with this appliance has 3 cores for use with single phase supply with neutral and earth.

Note: it is not recommended that the Gyratory Compactor is powered from a supply that contains an RCD. Use of an RCD might result in the supply tripping when the machine is switched on.

The wire in the mains lead are coloured in accordance with the following code:

Wire colour	Function
Green/Yellow	Earth
Blue	Neutral
Brown	Live

Note: the colours of the wires in the mains lead of this appliance might not correspond with the colours in the wall socket.

3.3 Pneumatic Supply

Warning: the following operations should only be carried out by suitably qualified staff.

The machine requires a pneumatic supply with a minimum pressure of 6bar, maximum 10bar. 7bar is required to achieve test load on 150mm diameter specimen, 10cfm. The machine is supplied with 8mm tubing for connection to the compressed air supply. The supply should be attached to the Air Inlet Regulator.

4. Software Installation

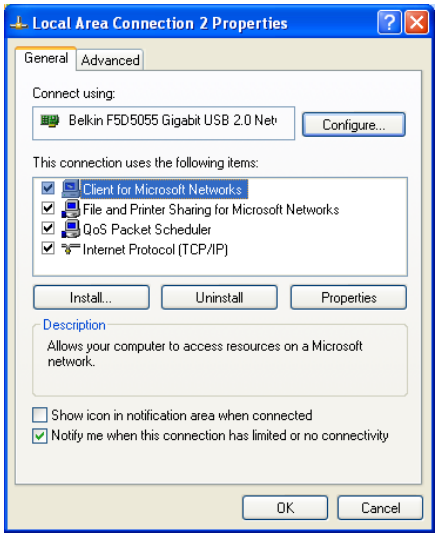
It is important to ensure the software is installed before the NI software.
Contact ELE International for assistance.

Connect the USB from the PC to the machine, if the PC pops up with a window asking to install new hardware then insert the disc provided which is labelled ‘BELKIN Gigabit USB 2.0 Network adapter’ and follow these steps:

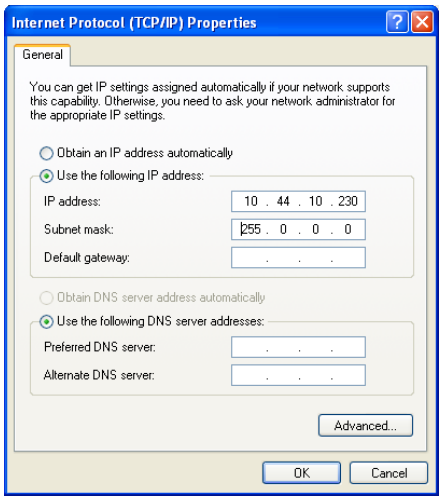
- Follow the steps in the install wizard, once complete a new local area network connection will be available.

- Open ‘network connections’ which can be accessed through the settings part of the windows start menu.

- Locate the new connection and right click, and select properties. The window below should appear, ensure ‘Belkin F5D5055’ is in the text box in ‘Connect using:’



- Highlight ‘Internet Protocol (TCP/IP)’ and click the properties button.
- Select ‘use the following IP address’ and enter the values shown below:



- Click ‘OK’ once the values have been entered to confirm.

5. Operation

This section describes how to use the Gyratory Compactor and its software to perform a compaction.

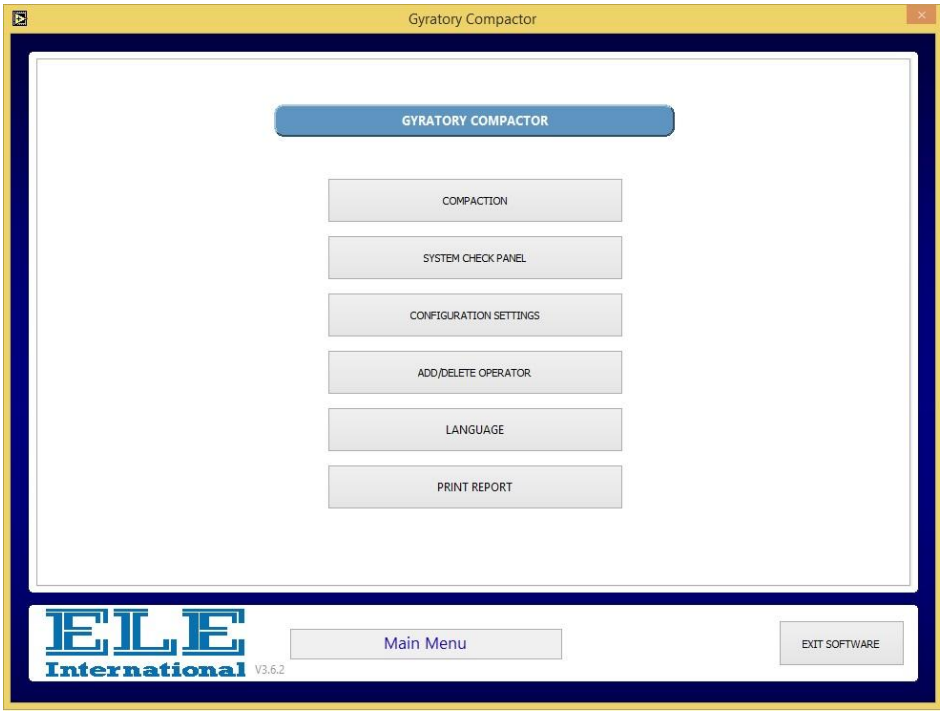
5.1 Start up the Compactor

The Gyratory Compactor is controlled by the PC which should be positioned to the right hand side of the machine. To turn on the machine and start the software follow this procedure:

1. Ensure the machine is connected to the electrical and pneumatic supplies, and the Gyratory Compactor Ethernet cable is connected to the PC.
2. Turn the isolator switch on the rear panel to the “I” position.
3. Turn the red valve on the air inlet to the “SUP/ON” position. Ensure the pressure gauge reads 0.6mpa minimum. If the pressure is reading less than this pull the centre black adjuster up and ensure it is fully open.
4. Press the power button on the front panel.
5. Wait until the Red power light on the front panel of the machine lights before running the software.

5.2 Start the Software

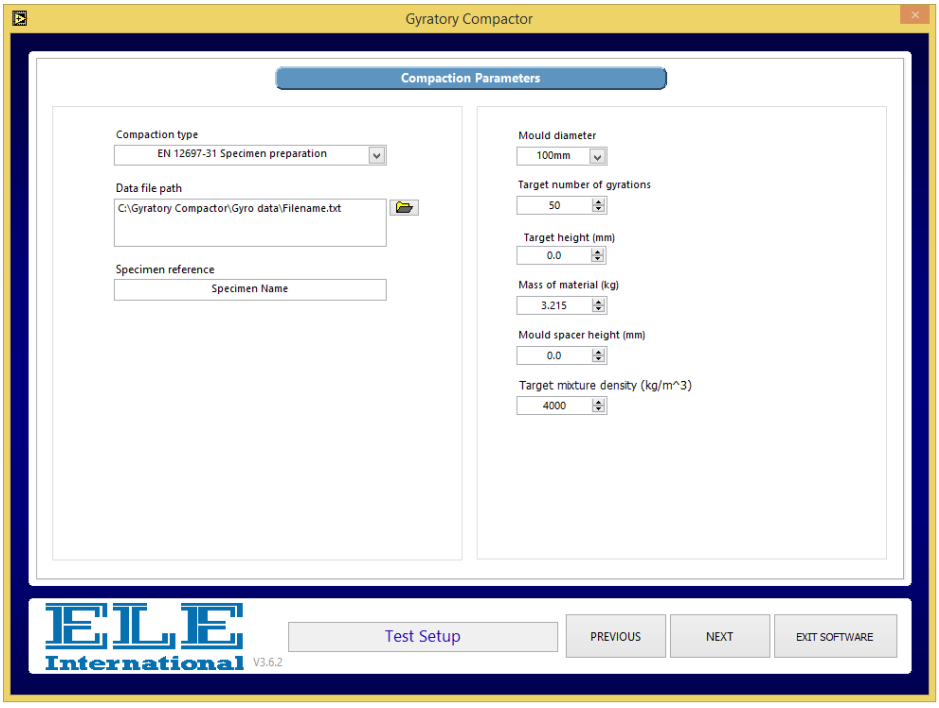
Open the Gyratory Compactor software via the icon situated on the desktop or Windows Start menu. The following screen will appear.



5.3 Performing a Compaction

To perform a compaction click **Compaction**. The following screen will appear.

Note: you can return at any point by clicking **Previous**.



The software offers 3 different compaction options as follows:

EN 12697-31 Specimen preparation – this option is designed to compact specimens for use in further testing (i.e. for Marshall testing).
The normal method of operation would be to set a target number of cycles, but a target density or target height can also be entered.
The machine will end compaction whichever end criteria is met first.

EN 12697-31 Void content analysis – This option will run for a set number of cycles and calculate/record void content according to EN 12697-31.

AASHTO T312-09 – This method will run for a set number of cycles and calculate density and void content in accordance with AASHTO T312-09

Data file path: In all cases a data file can be selected into which test data is recorded. The format is Windows tab-delimited so data can easily be imported into Excel for further analysis.

Specimen reference: A mixture reference/name can be entered here.

Mould diameter: The correct mould diameter for the desired mould size should be selected here.

Target number of gyrations: Sets the number of gyrations to run after which compaction will end.

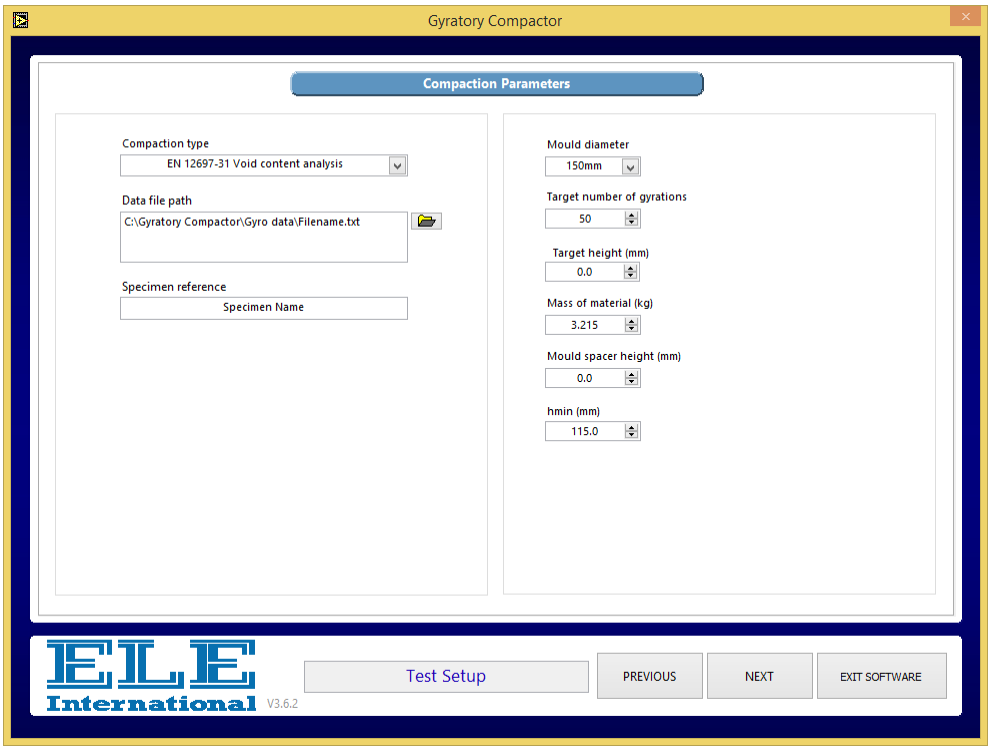
Target Height: If a value is entered here then the compaction will end if the target height is reached (even if the set number of gyrations is not reached).

Mass of material (kg): Enter the mass of the mixture in kg here.

Mould spacer height (mm): If extra spacers are used (for compacting to smaller sample heights for example) then enter the thickness of those spacers here.
Note: It is not necessary to enter the top and bottom platen thickness here – the thickness of those is taken into account by the height calibration.

Target mixture density (kg/m^3): You can enter a target density here after which the compaction will stop if reached.

If compaction type EN 12697-31 Void content analysis is selected then further data entry parameters are shown:



hmin (mm): For Void content analysis, the Void content % is calculated in accordance with EN 12697-31.

$$v\left(n_g\right)\% = 100\left[\frac{h\left(n_g\right) - h_{min}}{h\left(n_g\right)}\right] \qquad (2)$$

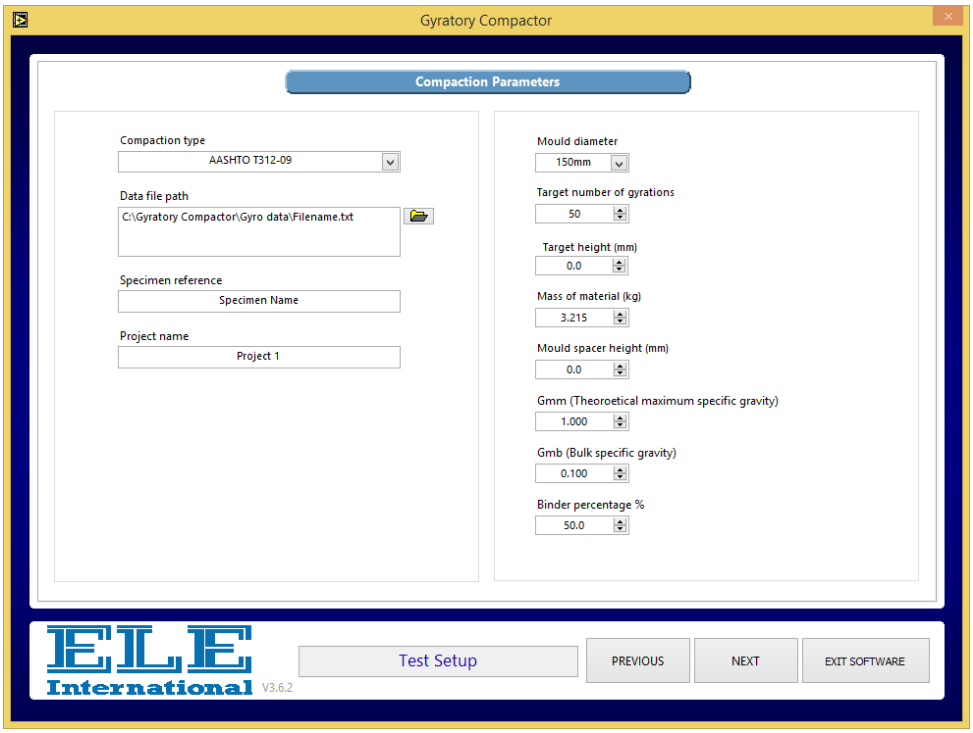
where $v(n_g)$ is the void content after a number of gyrations n_g, in percentage (%);

$h(n_g)$ is the height of the specimen after a number of gyrations n_g, in millimetres (mm);

h_{min} is the minimum height of the compacted specimen, corresponding to a zero percentage of voids, in millimetres (mm).

hmin should be entered by the user to ensure the calculated void content is correct, a value of 115mm is often used.

If compaction type AASHTO T-312 is selected then further data entry parameters are shown:



Gmm (Theoretical maximum specific gravity): this should be calculated and entered in accordance with AASHTO-T312 as defined –

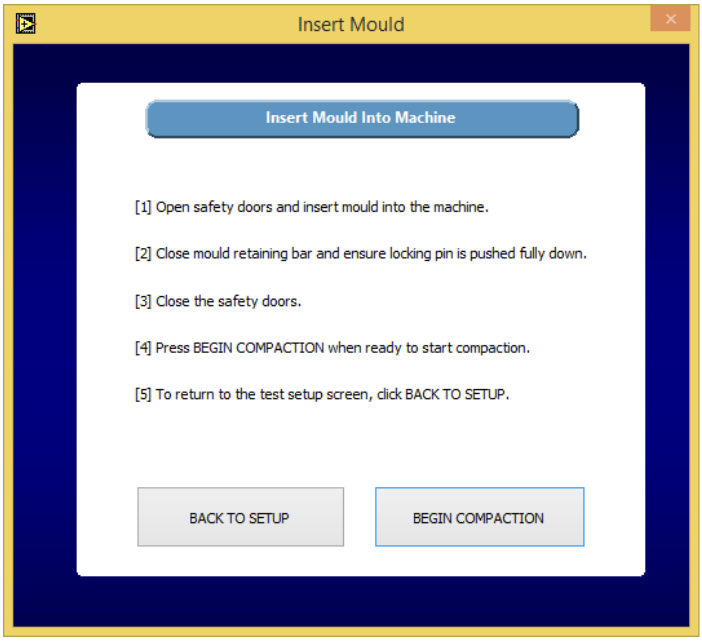
10.1. Determine the maximum specific gravity (G_{mm}) of the loose mix in accordance with T 209 using a companion sample. The companion sample shall be conditioned to the same extent as the compaction sample.

Gmb (Bulk specific gravity): this should be calculated and entered in accordance with AASHTO-T312 as defined –

10.2. Determine the bulk specific gravity (G_{mb}) of the specimen in accordance with T 166 or T 275 as appropriate.

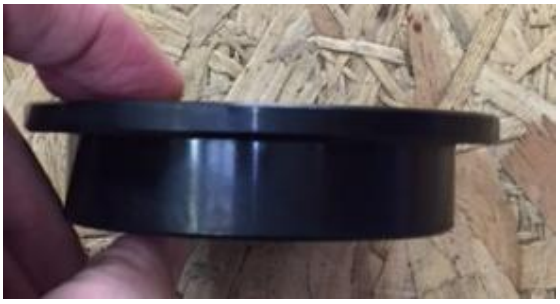
Binder percentage %: AASHTO-T312 requires that the Binder percentage to the nearest 0.1% is recorded.

Click 'NEXT' when the desired test parameters have been set.



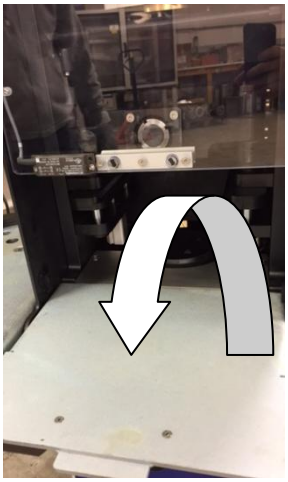
1. Place the bottom platen into the bottom of mould. We recommend paper disks are placed between platens and material. **Note:** the 100mm bottom platen should be inserted such that the smaller diameter is towards the bottom.
2. Place a known mass of material into the mould.
3. Position top platen on top of the material.

Note: The 100mm bottom platen has a different profile to the top platen, the 150mm top and bottom platens are identical.

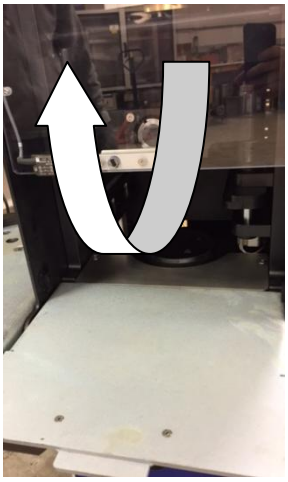


Mould layout:

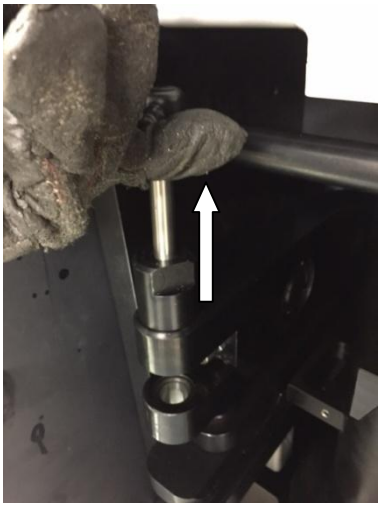
4. Open the bottom safety door by pulling the door towards you.

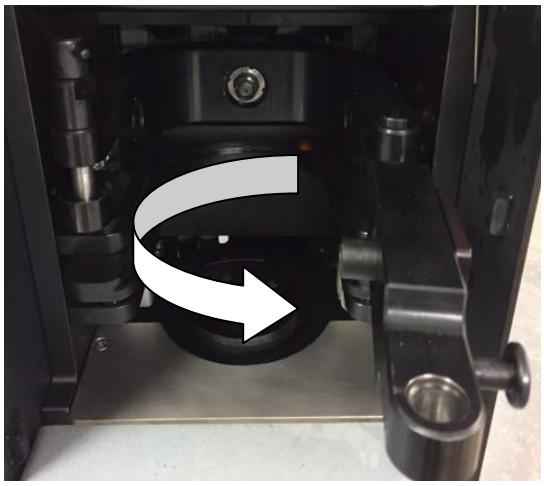


5. Open the top safety door by lifting up until the magnets hold the door in place.



6. Open the mould retaining bar by lifting the retaining pin up and pulling the bar towards you.





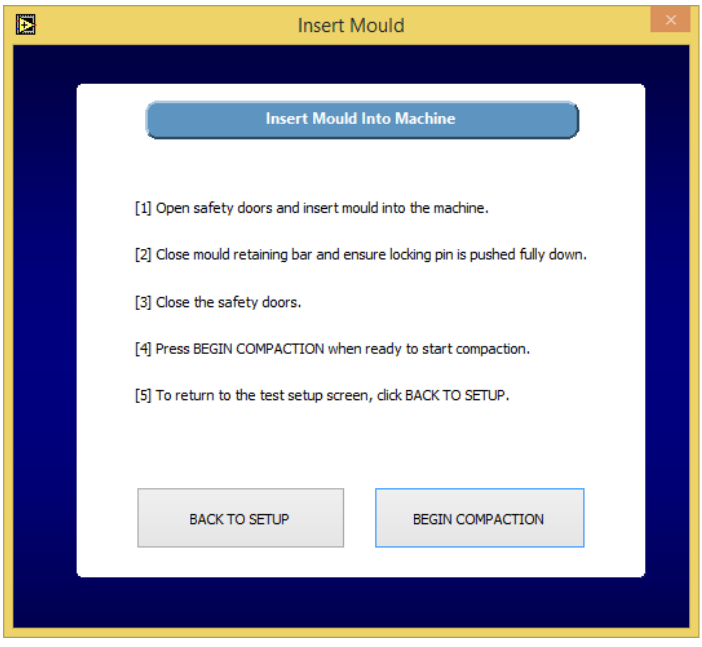
Select the correct pressure for size of mould by turning the pressure regulator on the right hand side of machine to either **Low** for 100mm moulds or **High** for 150mm moulds.

100mm Moulds

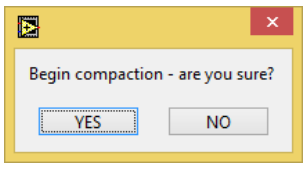
150mm Moulds

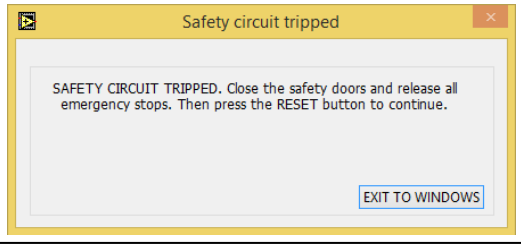
Follow the on screen instructions:

1. Insert mould into machine – ensure the mould faces the correct direction as indicated in the mould layout diagram above.
2. Close mould retaining bar and ensure locking pin is pushed fully down.
3. Close the safety doors. Top door first then bottom door.
4. Press begin compaction on-screen when ready to start compaction.

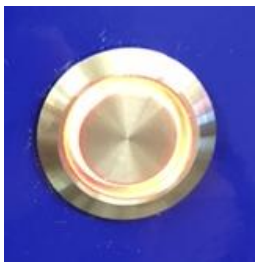


Note: you can return to the test setup screen by clicking **back to setup**.

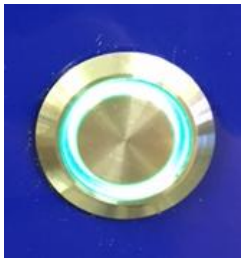




Press the safety reset switch on the front panel. The switch light turns from red to green and compaction begins.



Press



The machine will now automatically begin compaction with the following sequence:

1. Motor begins to turn
2. Mould is lowered down and locked in place
3. The main piston comes down and applies the 600kPa compaction pressure
4. The software starts counting gyrations

Note: To stop the test in an emergency, press the Emergency stop switch or open the machine door.
The machine will stop immediately in this case and inform the user to exit the software.

When compaction is finished (or if END COMPACTION is pressed) the software will indicate this with a COMPACTION FINISHED message:

The main piston will lift removing the load, the mould will lift and the motor will stop. Open the safety doors, lift the mould retaining pin and open the mould retaining bar then slide the mould out of the machine.

5.4 Specimen Extraction

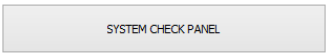
1. Slide the mould over the mould extraction ram. Ensure it seats under the retaining rim.

2. Turn the green mould extraction switch to the RAISE position. The mould will be extracted.

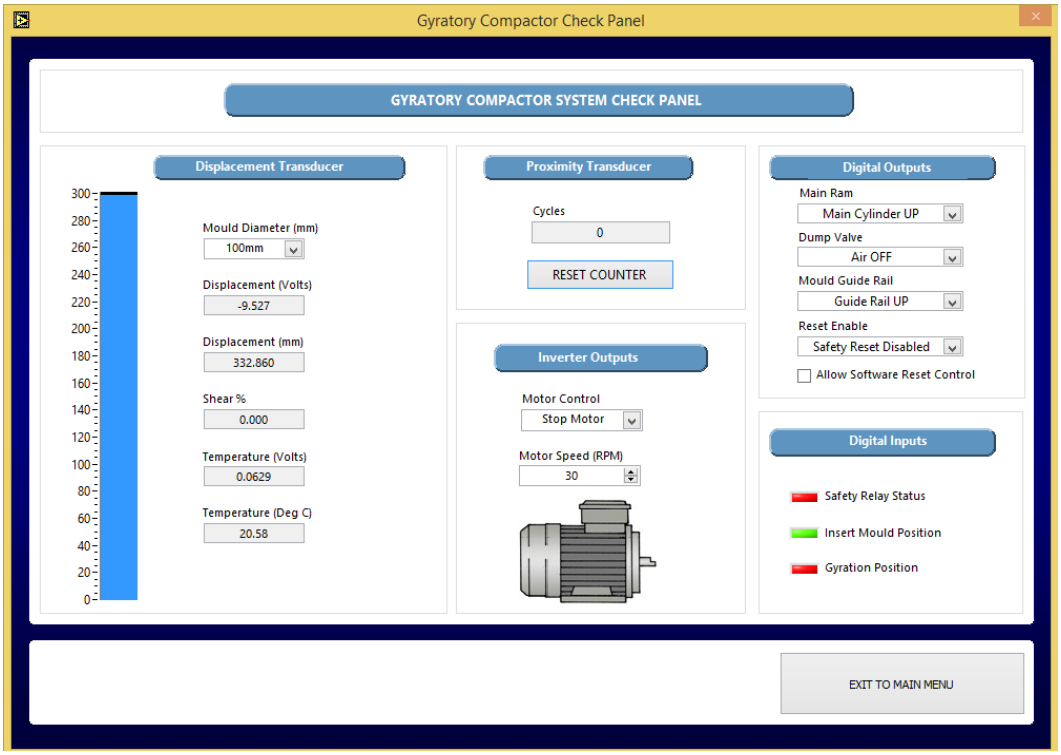
3. After the mould has been extracted turn the green switch back to the LOWER position allowing the mould to be removed.

5.5 Main menu options

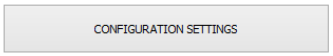
System Check Panel:

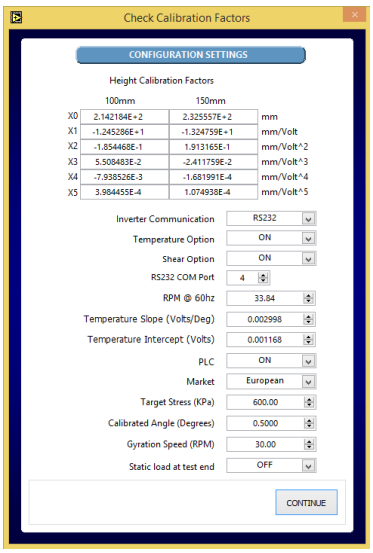


This allows access to manual control of the compactor for diagnostic and calibration purposes. Each function of the machine can be operated independently from here:



Configuration settings (Password protected):



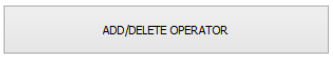


The configuration settings screen is password protected and contains access to the calibration factors associated with the machine and also allow the machine to be configured for various factory options:

Temperature option – This allows for a PT-100 temperature to be fitted and placed inside holes drilled in the front of the moulds and records the mould temperature during a compaction.

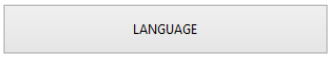
Shear option – This is when factory set allows a measure of the shear effort (in % of maximum motor current to be measured during compaction and can be used for comparative purposes, i.e. one mixture against another).

Add/Delete Operator:



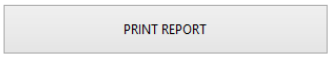
This menu selection allows different users to be created with two levels (Engineer or Technician).
Only Engineer level has access to the calibration and configuration parameters.
User passwords can be changed in this screen also.

Language:



The Gyratory Compactor software is translatable via a translation file, the Language option from the main menu allows pre-defined language options to be selected.

Print report:



The print report option allows the user to select a previous compaction and produce a report of the compaction data, example shown below.

Gyratory Compactor

Filename

C:\Gyratory Compactor\Gyro data\Filename.txt

Test Information

Gyratory compaction software V3.6.2

EN 12697-31 (Specimen preparation)

Time & date: 22/02/2016 - 12:58
Mixture identification:
Mold diameter (mm): 100
Mass Of material (g): 3215.00
Mould spacer height (mm) 0.0
Speed (Rev/min) 30.00
Compaction internal angle (Degrees) 0.50
Compaction Stress (KPa) 600.00

Compaction ended sucessfully

Final number of gyrations = 3
Final height = 129.07 mm
Final density = 3171.53 kg/m^3

This report can be printed or saved as a jpeg for future retrieval.

6. Maintenance

This section contains details on general and routine maintenance of the Gyratory Compactor.

Warning: the following operations are to be carried out by skilled staff only.

6.1 Maintenance Schedule

Note: the following maintenance should be carried out by skilled staff. For further information regarding maintenance contact ELE International.

ID	Interval	Description	Ref
1	Daily	Ensure any foreign objects that may have fallen into the tray, crevices etc. are removed.	
2	Daily	Check control panel warning lights.	
3	Weekly	Visually check the hydraulic oil reservoir, if low top up and check for leaks.	
4	Weekly	All tubing and fittings on the pneumatic circuits to be checked for leaks and rectified accordingly.	
5	Weekly	Lubricate the main ram using a light oil eg. WD40.	
5	3 months	Service the motor	MP1
6	3 months	service the gearbox	MP2
7	Yearly	change air inlet filters	

6.2 MP1 - Service the Motor

Before any intervention, the motor, auxiliary circuits and/or accessories must be disconnected from the mains.

In particular:

- Check disconnection from the electrical mains.
- Provide suitable protection from exposed live parts.
- Double check that accidental restarts are not possible under any circumstances.

It is recommended that periodical checks of motor operating conditions are scheduled as a routine maintenance practice.

Check particularly on the following:

1. Check that operation is smooth and absorbed current within rated value.
2. Keep motor clean and fan cowl unobstructed by accumulation of dust or foreign particles.
3. Check that seal rings are in good condition.
4. Check that lead-in wires and all wirings are safely and tightly secured.
5. If condensate draining holes are provided, remove periodically the screws that close the holes and allow the condensate to drain.
6. Standard bearings are grease packed for life and in general no periodical maintenance is required; it is good practice however to check their condition and eventually replace them after approx. 3 years.

The motor does not have to be removed for normal inspections unless the bearings need to be replaced. In this case, the operations should be performed by specialised personnel and with appropriate tools.

6.3 MP2 – Service the Gearbox

Warning: before doing any work on the unit, the operator must first switch off the power to the gear unit and ensure that it is out of service, as well as taking all necessary precautions against it being accidentally switched on again or its parts moving without warning (due to suspended loads or similar external factors). Furthermore all additional environmental safety precautions must be taken (e.g. elimination of residual gas or dust, etc).

- Before doing any maintenance work, activate all safety equipment and if necessary, inform persons working in the vicinity. In particular, mark off the area around the unit and prevent access to any equipment which, if activated, might be the cause of unexpected health and safety hazards.
- Replace worn components with original spare parts only.
- Use the lubricants (oil and grease) recommended by the manufacturer.
- When working on the gear unit always replace gaskets and seals with new original ones.
- If a bearing requires replacement, it is good practice to also replace the other bearing supporting the same shaft.
- We recommend replacing the lubricating oil after all maintenance work.

Note: the above instructions are aimed at ensuring efficient and safe operation of the gear unit. The manufacturer declines all liability for injury and damage to components due to the use of non-original spare parts and non-routine work, which modifies the safety requirements without the express prior authorisation of the manufacturer. Refer to ELE International to order spare parts for the gear unit.

Warning: do not dump polluting liquids, worn parts and maintenance waste into the environment. Dispose of all such materials as stipulated by applicable legislation.

- Observe the routine inspection and maintenance schedule.
- Before servicing or repairing internal components, allow the gear unit to cool down completely before opening the casing so as to avoid burns from parts which are still hot.
- Make sure, on completion of maintenance work, that all vent, filler and level plugs are tightened to their specified torque.
- On completion of any maintenance work, all seals must be refitted and sealed as prescribed. On gear units with double seal rings, the cavity between the two rings must be packed with synthetic grease (fluorocarbon gel 880 ITP or equivalent product with similar properties and application range) before assembly.
- Regardless of the type of gear unit, whenever a seal ring is replaced its lips should be smeared with a thin layer of grease (fluorocarbon gel 880 ITP or equivalent product with similar properties and application range) before assembly.
- Use only original spare parts for repairs.

6.4 Routine Maintenance

Keep the gear unit at its maximum efficiency by following the routine maintenance schedule specified by the manufacturer.

Good maintenance enables the unit to operate at its maximum performance over a long service life in compliance with safety regulations.

Frequency	Component	Type of work	Operation
1000h	External seals and gaskets	Check oil level. Check for leaks by eye	Maintain or replace components as required
3000h	For gear units with torque arm	Check for cracks/ageing	Replace if no longer fully effective
5000h	Gear unit seals and gaskets	Inspect carefully for wear/ageing of external seals	Replace if aged or worn

Depending on the temperature reached by the lubricant, it should be replaced at the intervals indicated in table below:

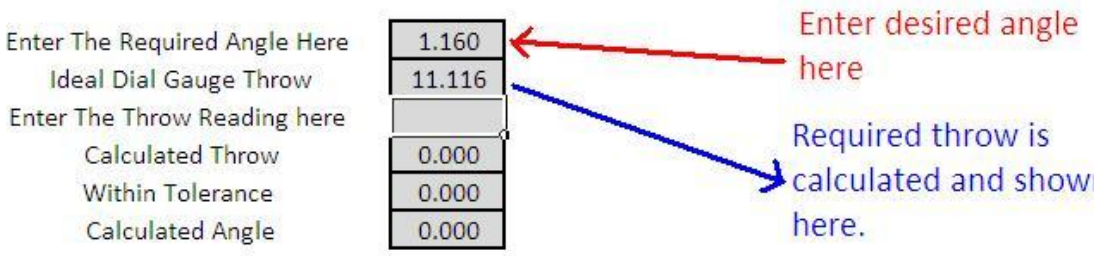
Oil temperature t(°C)	Hours
t<65	25000
65<t<80	15000
80<t<95	12500

7. CALANG (External Angle Gauge)

(Available as an accessory item at extra cost)

Using the Gyratory Compactor external angle gauge

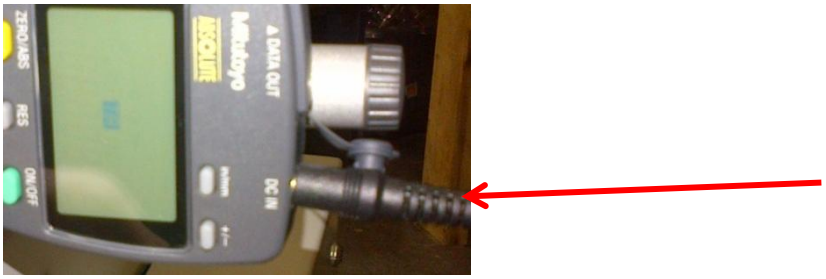
[1] Enter the desired angle into the Dial gauge calculation spreadsheet (Main sheet tab) as shown below to calculate the required throw in mm:



[2] Attach the dial gauge to the Gyratory Compactor using the supplied mounting screws.

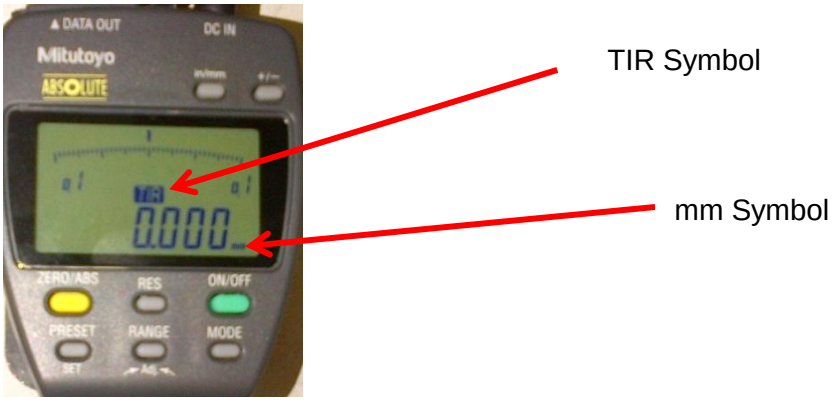
Please note there are three small phillips screws which attach the dial gauge to the bracket (these are normally fitted before delivery), and two allen screws which attach the dial gauge/bracket assembly to the Gyratory Compactor:

[3] Connect the dial gauge power supply cable to the mains supply:



[4] Power ON the dial gauge with the Green On/Off button, the dial gauge screen will illuminate to indicate power is On.

[5] If the display shows TIR and mm as shown below, the unit is ready for use (Go to Step 7) otherwise follow step 6 to set up the display:



[6] If the display is locked (shown by a padlock symbol as below), press and hold the in/mm and +/- buttons until the padlock disappears:

If 'TIR' is not shown on the display, press the 'Mode' button repeatedly until TIR shows on the display, then press 'PRESET' to set TIR (Max-Min mode) as shown below:

Ensure the display is showing mm (not ‘in’) by pressing the in/mm button until mm is shown on the bottom right of the display:

Also ensure that the display is set to three decimal places by pressing the ‘RES’ button until three decimal places are shown.

Lock the unit to retain the settings for future use by pressing and holding the ‘in/mm’ and ‘+/-‘ buttons together until the padlock symbol is shown on the left of the display.

[7] Zero the dial gauge by pressing the ‘PRESET’ grey button, the display will show 0.000mm

[8] Run the Gyratory Compactor machine for at least 10 gyrations either in the normal compaction mode or by running the motor in the Gyratory Compactor software check panel.

It is not necessary to insert a mould for this.

[9] Once at least 10 gyrations are complete, the display on the dial gauge will indicate the measured throw (Max-min) in mm:

Compare the indicated throw with the required throw calculated using the angle spreadsheet in Step [1] above.

If the indicated throw is not within approximately +/-0.16mm of the required throw then adjust the physical throw on the machine (instructions for this are shown below) and then repeat steps 7-9 above to re-check the new angle.

[10] Instructions for adjusting the internal Angle.

a) Please remove the base plate by unscrewing the two screws (circled in image below). Please retain the screws and base plate.

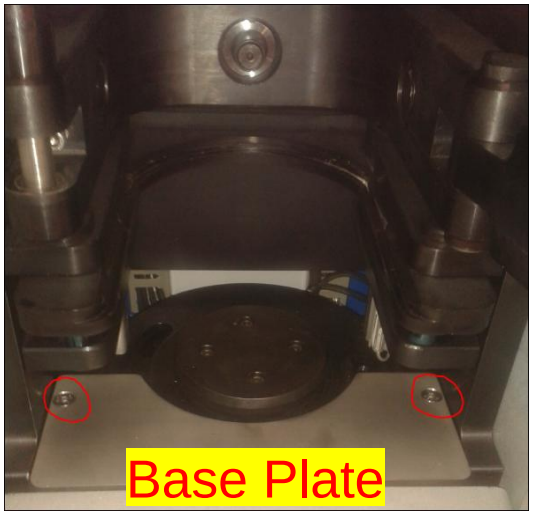
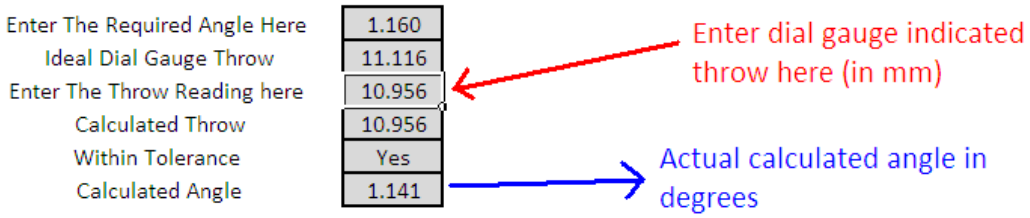


Figure 1

b) Gently slacken (i.e. loosen the bolts, but *DO NOT* undo completely) the 4 bolts circled in image (Figure 2) below to adjust the angle. This will allow bottom plate (i.e plate to which the 4 bolts are fastened) to rotate for adjusting the angle.
c) Manually rotate the bottom plate. Clockwise rotation of the plate would allow you to decrease the angle and anti-clockwise to increase the angle.
d) When the bottom plate is set at desired position, tighten the 4 bolts to hold the bottom plate in position then use the CRT-CALANG device to measure the current angle.
e) Follow the steps b-d until desired angle (ex: 1.160 degrees) is set on the machine.
f) Once the desired angle is set, put the base plate back and fasten the plate with 2 screws circled in above image (figure 1).

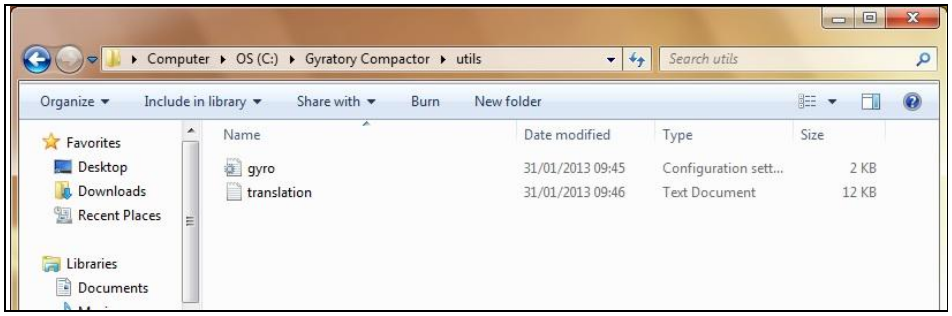
Figure 2

[11] Once the indicated throw is as close as possible to the required throw (within +/- 0.16mm), enter the indicated throw in the angle spreadsheet as shown below to calculate the actual set angle in Degrees:

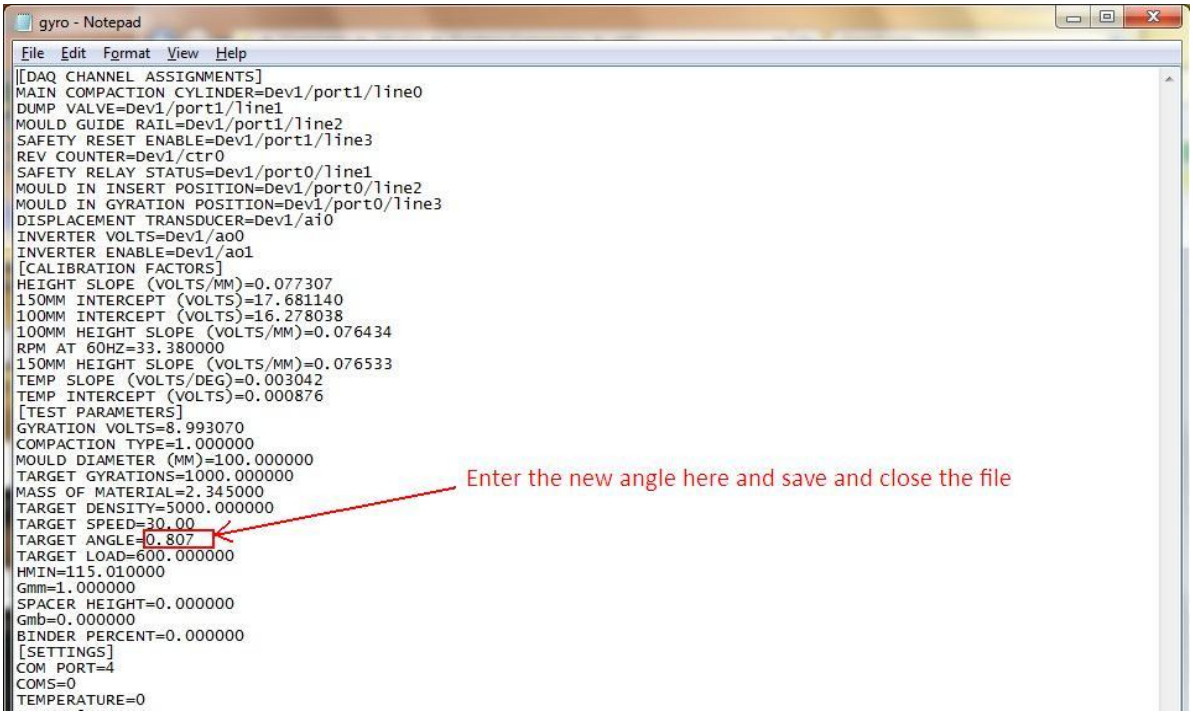


[12] The new physical angle can now be entered into the software configuration file as follows:

Open the 'c:\gyratory compactor\utils\gyro.ini' file in Windows Notepad:



Update the value next to the 'TARGET ANGLE =' field with the new angle then save and close the Gyratory Compactoro.ini file:



[13] The CRT-CALANG assembly can now be removed from the gyratory compactor.

DIRECTIVE ON WASTE ELECTRICAL & ELECTRONIC EQUIPMENT (WEEE)

Electrical equipment marked with this symbol may not be disposed of in European public disposal systems after 12 August of 2005. In conformity with European local and national regulations (EU Directive 2002/96/EC), European electrical equipment users must now return old or end-of life equipment to the Producer for disposal at no charge to the user.

Note: *For return for recycling, please contact the equipment producer or supplier for instructions on how to return end-of-life equipment for proper disposal.*

Important document. Retain with product records.

GERMAN

Elektrogeräte, die mit diesem Symbol gekennzeichnet sind, dürfen in Europa nach dem 12. August 2005 nicht mehr über die öffentliche Abfallentsorgung entsorgt werden. In Übereinstimmung mit lokalen und nationalen europäischen Bestimmungen (EU-Richtlinie 2002/96/EC), müssen Benutzer von Elektrogeräten in Europa ab diesem Zeitpunkt alte bzw. zu verschrottende Geräte zur Entsorgung kostenfrei an den Hersteller zurückgeben.

Hinweis: *Bitte wenden Sie sich an den Hersteller bzw. an den Händler, von dem Sie das Gerät bezogen haben, um Informationen zur Rückgabe des Altgeräts zur ordnungsgemäßen Entsorgung zu erhalten.*

Wichtige Informationen. Bitte zusammen mit den Produktinformationen aufbewahren.

FRENCH

A partir du 12 août 2005, il est interdit de mettre au rebut le matériel électrique marqué de ce symbole par les voies habituelles de déchetterie publique. Conformément à la réglementation européenne (directive UE 2002/96/EC), les utilisateurs de matériel électrique en Europe doivent désormais retourner le matériel usé ou périmé au fabricant pour élimination, sans frais pour l'utilisateur.

Remarque : *Veuillez vous adresser au fabricant ou au fournisseur du matériel pour les instructions de retour du matériel usé ou périmé aux fins d'élimination conforme.*

Ce document est important. Conservez-le dans le dossier du produit.

ITALIAN

Le apparecchiature elettriche con apposto questo simbolo non possono essere smaltite nelle discariche pubbliche europee successivamente al 12 agosto 2005. In conformità alle normative europee locali e nazionali (Direttiva UE 2002/96/EC), gli utilizzatori europei di apparecchiature elettriche devono restituire al produttore le apparecchiature vecchie o a fine vita per lo smaltimento senza alcun costo a carico dell'utilizzatore.

Nota: *Per conoscere le modalità di restituzione delle apparecchiature a fine vita da riciclare, contattare il produttore o il fornitore dell'apparecchiatura per un corretto smaltimento.*

Documento importante. Conservare con la documentazione del prodotto.

DANISH

Elektriske apparater, der er mærket med dette symbol, må ikke bortskaffes i europæiske offentlige affaldssystemer efter den 12. august 2005. I henhold til europæiske lokale og nationale regler (EU-direktiv 2002/96/EF) skal europæiske brugere af elektriske apparater nu returnere gamle eller udtjente apparater til producenten med henblik på bortskaffelse uden omkostninger for brugeren.

Bemærk: *I forbindelse med returnering til genbrug skal du kontakte producenten eller leverandøren af apparatet for at få instruktioner om, hvordan udtjente apparater bortskaffes korrekt.*

Vigtigt dokument. Opbevares sammen med produktdokumenterne.

SWEDISH

Elektronikutrustning som är märkt med denna symbol kanske inte kan lämnas in på europeiska offentliga sopstationer efter 2005-08-12. Enligt europeiska lokala och nationella föreskrifter (EU-direktiv 2002/96/EC) måste användare av elektronikutrustning i Europa nu återlämna gammal eller utrangerad utrustning till tillverkaren för kassering utan kostnad för användaren.

Obs! *Om du ska återlämna utrustning för återvinning ska du kontakta tillverkaren av utrustningen eller återförsäljaren för att få anvisningar om hur du återlämnar kasserad utrustning för att den ska bortskaffas på rätt sätt.*

Viktigt dokument. Spara tillsammans med dina produktbeskrivningar.

SPANISH

A partir del 12 de agosto de 2005, los equipos eléctricos que lleven este símbolo no deberán ser desechados en los puntos limpios europeos. De conformidad con las normativas europeas locales y nacionales (Directiva de la UE 2002/96/EC), a partir de esa fecha, los usuarios europeos de equipos eléctricos deberán devolver los equipos usados u obsoletos al fabricante de los mismos para su reciclado, sin coste alguno para el usuario.

Nota: *Sírvase ponerse en contacto con el fabricante o proveedor de los equipos para solicitar instrucciones sobre cómo devolver los equipos obsoletos para su correcto reciclado.*

Documento importante. Guardar junto con los registros de los equipos.

DUTCH

Elektrische apparatuur die is voorzien van dit symbool mag na 12 augustus 2005 niet meer worden afgevoerd naar Europese openbare afvalsystemen. Conform Europese lokale en nationale wetgegeving (EU-richtlijn 2002/96/EC) dienen gebruikers van elektrische apparaten voortaan hun oude of afgedankte apparatuur kosteloos voor recycling of vernietiging naar de producent terug te brengen.

Nota: *Als u apparatuur voor recycling terugbrengt, moet u contact opnemen met de producent of leverancier voor instructies voor het terugbrengen van de afgedankte apparatuur voor een juiste verwerking.*

Belangrijk document. Bewaar het bij de productpapieren.

POLISH

Sprzęt elektryczny oznaczony takim symbolem nie może być likwidowany w europejskich systemach utylizacji po dniu 12 sierpnia 2005. Zgodnie z europejskimi, lokalnymi i państwowymi przepisami prawa (Dyrektywa Unii Europejskiej 2002/96/EC), użytkownicy sprzętu elektrycznego w Europie muszą obecnie przekazywać Producentowi stary sprzęt lub sprzęt po okresie użytkowania do bezpłatnej utylizacji.

Uwaga: *Aby przekazać sprzęt do recyklingu, należy zwrócić się do producenta lub dostawcy sprzętu w celu uzyskania instrukcji dotyczących procedur przekazywania do utylizacji sprzętu po okresie użytkowania.*

Ważny dokument. Zachować z dokumentacją produktu.

PORTUGESE

Qualquer equipamento eléctrico que ostente este símbolo não poderá ser eliminado através dos sistemas públicos europeus de tratamento de resíduos sólidos a partir de 12 de Agosto de 2005. De acordo com as normas locais e europeias (Directiva Europeia 2002/96/EC), os utilizadores europeus de equipamentos eléctricos deverão agora devolver os seus equipamentos velhos ou em fim de vida ao produtor para o respectivo tratamento sem quaisquer custos para o utilizador.

Nota: *No que toca à devolução para reciclagem, por favor, contacte o produtor ou fornecedor do equipamento para instruções de devolução de equipamento em fim de vida para a sua correcta eliminação.*

Documento importante. Mantenha junto dos registos do produto.