

Apex 400 Press Hydraulic Presses

User Manual



Apex 400 Press Hydraulic Press

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List of Safety Symbols

Safety Symbol	Meaning
	Caution (Reference ISO 7000-0434B, 2004-01)
	Caution – Possibility of Electric Shock
	Indoor Use Only

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1. Introduction

Thank you for purchasing a Specac product.

The Apex 400 Hydraulic Press is an automatic and programmable 400kN (40 tonnes) hydraulic press which has been designed for a wide variety of pressing applications within the laboratory or heavy industrial environments, to apply a load from 40kN to 400kN. These presses are specifically suited to the preparation of solid sample discs, particularly for pellets at 40mm diameter or pressing samples into steel rings.

The press includes a touch screen for setting up a pressing sequence.

The Apex press is provided with USB connectivity if it is a requirement to operate the press remotely from a computer system. For remote operation, please see Section 10 in this manual.

The Apex press is fully CE marked to comply with strict European regulations.

WEEE Directive for Equipment Disposal



The symbol (above) on the back of the press indicates that this product complies with the Waste Electrical and Electronic Equipment Directive (WEEE). If this product is in use and was purchased within the European Union, please contact your local sales agent or Specac to make arrangements for disposal of this equipment.

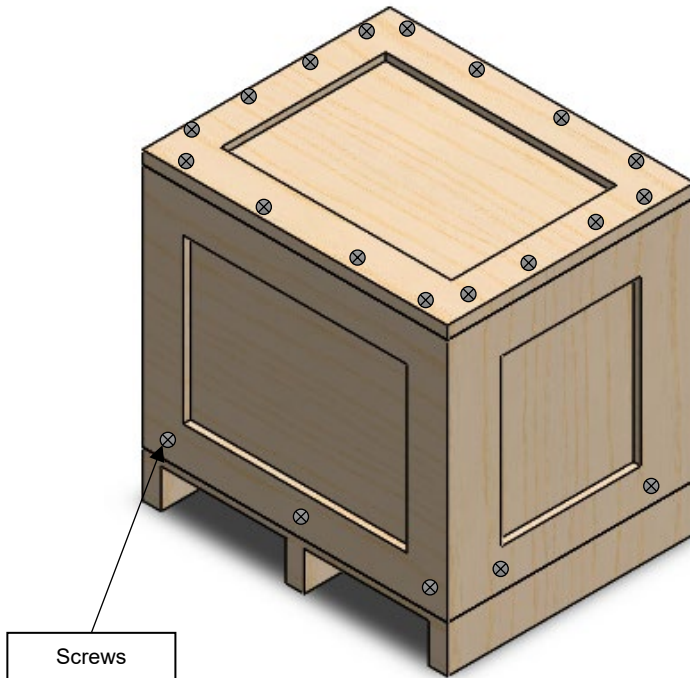
The equipment must be cleaned and decontaminated before disposal.

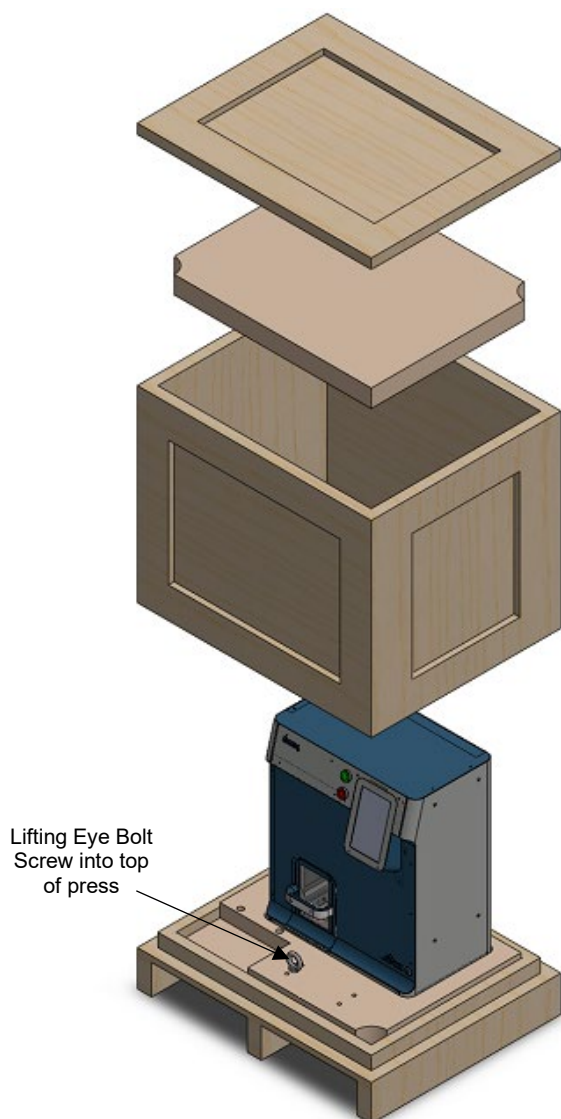
2. Unpacking, Checking and Installation



CAUTION! The Apex 400 press is 120kg and care must be taken to transport it correctly. Please keep the press packing materials for future transportation, if necessary, by reversing the following procedure. This will protect you and the press from accident or injury.

The Apex 400 press is shipped in a wooden crate with a special pallet base. The lid of the crate and the sides of the crate can be removed by removing the screws as shown. The press is packed with a lifting “eye bolt” which needs screwing into the hole in the top of the press.





The press is now ready to be lifted out of the wooden crate.



CAUTION: *The press **MUST** be lifted into its working position using a suitable hoist (or crane) with a lifting hook to pass through the eye bolt. DO NOT ATTEMPT TO LIFT THE PRESS BY ANY OTHER METHOD. DO NOT USE A PIPE OR BAR THROUGH THE LIFTING EYE. DO NOT USE THE HANDLE ON THE FRONT TO LIFT THE PRESS.*

The press can now be lifted upwards and out of the crate using a crane or hoist. For example, an Engine Hoist or Powered hand truck can be used. If the crane is stationary, then the press can also be lifted onto a scissor lift trolley for transport and then slid from the trolley onto the workbench.



Place the press in its working position. The bench worktop should be of a minimum thickness of 25mm, stable and level. The press needs to be sited near to an electrical power supply to connect to the press for operation.

CAUTION: The press should be positioned at least 25cm back, away from the edge of the worktop, so that the drawer is over the worktop when fully open.

The press is supplied filled with hydraulic oil (VG100, P/N GS25901) and is ready to use.

Specac would strongly advise that the Apex 400 press packing materials are retained and not destroyed, for future transportation should it be

required. Using the purpose-built packaging is the safest way of moving and containing the press to minimize for any possible damage in transit. Replacing an Apex 400 press in its packaging is the reverse of the procedure described previously.

The equipment must be cleaned and decontaminated before storing, disposal or moving.

For any inquiries to Specac regarding the Apex 400 press, **the serial number must be quoted**. The serial number is a five-digit number preceded by a letter and it is found on the electrical appliance label placed on at the rear of the press.

3. General Safety

Specac recommends that the following safety precautions should be followed for any operational procedure of the Apex 400 press.

Safety Regulations

Testing has been performed by the application of the following Regulations and Standards:

EN61010-1: 2010 +A1:2019 Safety requirements for laboratory equipment

EN61326-1: 2021 EMC requirements for laboratory equipment.

CE Marking

This product bears the “CE” marking and complies with Machinery Directive 2006/42/EC, EMC Directive 2014/30/EU, Low Voltage Directive 2014/35/EU and RoHS 3 Directive EU 2015/863.

Electrical Safety

WARNING: The equipment must be connected to an earthed electrical mains supply socket outlet. Do not use with an extension cable without a protective earth connection.

WARNING: Any interruption of the protective conductor may result in hazardous condition leading to possibility of an electrical shock hazard. Always ensure that the mains cord is free from obstructions and the appliance inlet is accessible to the user.

WARNING: Only use a suitably rated and approved mains cord set (power cable) acceptable for the local national regulations and standards.

CAUTION: Disconnect the mains power supply before cleaning and or servicing. Wear protective gloves for cleaning. No user serviceable parts within, refer all servicing requirements to a suitably qualified electrician or Specac approved representative.

CAUTION: When required, ensure that all fuses are replaced with the correct voltage, operating characteristics and current rating as specified in supporting documentation and on the rating label of the equipment.

CAUTION: Whenever it is likely that electrical protection has been impaired, the press should be made inoperative and be secured against unintended operation. Contact your local dealer or Specac for further advise and servicing requirements.

If the equipment is used in a manner not specified within this manual, the protection provided by the equipment may be impaired.

Operational Safety

The drawer, containing sample die, is an important component and its protection mechanism is linked to the operation of the press. When the drawer is open the press operation is disabled.

WARNING: If the drawer shows any visible signs of damage this may impair its effective performance for safe containment of parts within. Specac recommends that the drawer is replaced if damaged to conform to the correct safety standards.

CAUTION: If power supply is lost during operation of the press whilst a load is being applied DO NOT OPEN the drawer to try and remove the test sample. Should this occur please refer to the section on the Drawer (see page 33) for the correct procedure under these circumstances.

WARNING: The power cord is the overall form of disconnection and needs to be always kept accessible.

CAUTION: The die is heavy, so safety shoes should be worn if the die is removed for cleaning.

Do not attempt to press potentially combustible materials or materials with a low flash point temperature. Always consult your local safety and laboratory operating procedures before use.

Do not operate the press in very hot or very cold environments. The press is only intended to operate within its rated ambient temperature range (+10°C to +40°C).

Do not operate the press in **WET, DAMP** or **HUMID** environments. (Always allow enough time for condensation to evaporate before connection to the supply, especially if the press has been stored in cold conditions).

Do not operate the press if it shows any visible damage. The press may have been dropped in transit or damaged in use.

Do not continue operating the press if it fails to perform the intended tonnage and/or measurement of applied load.

Repair or Maintenance Safety

The Apex 400 Press must be disconnected from the mains supply before removing equipment covers for adjustment, replacement of faulty parts or general maintenance.

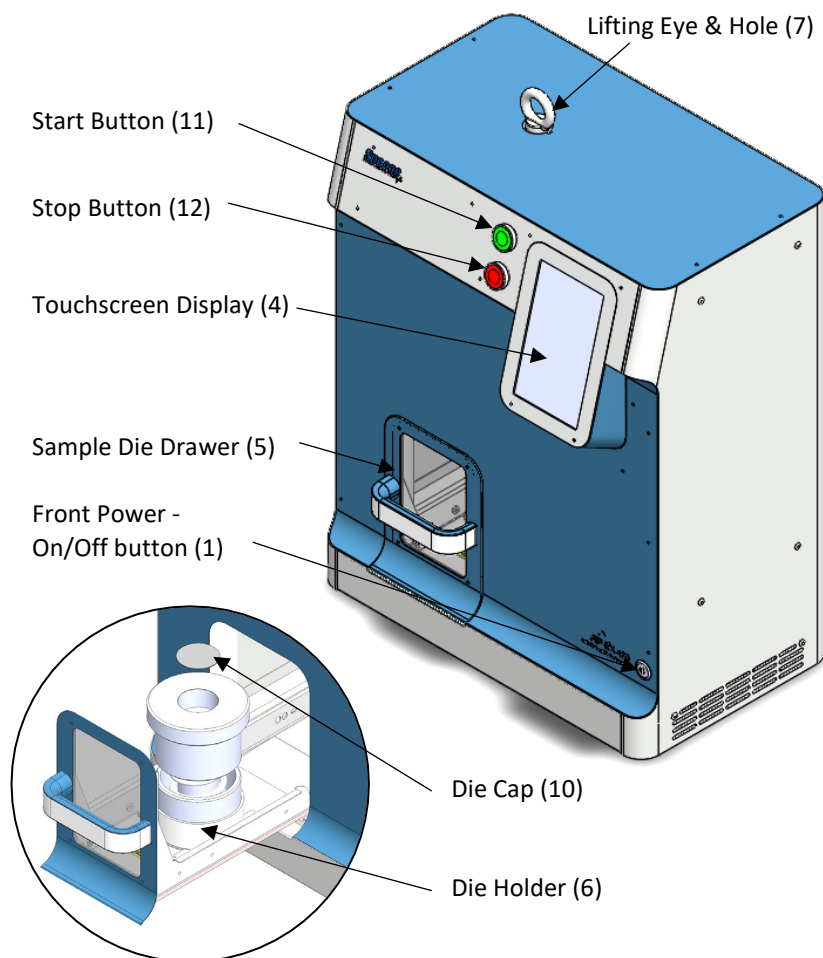
Any adjustment, maintenance or repair of the equipment while connected to the mains supply should be avoided as far as possible and if inevitable, should be carried out only by a qualified person who is aware of the hazards involved and/or Specac authorized agent.

Please do not remove the drawer. For cleaning it can be opened and wiped with a damp cloth or vacuumed.

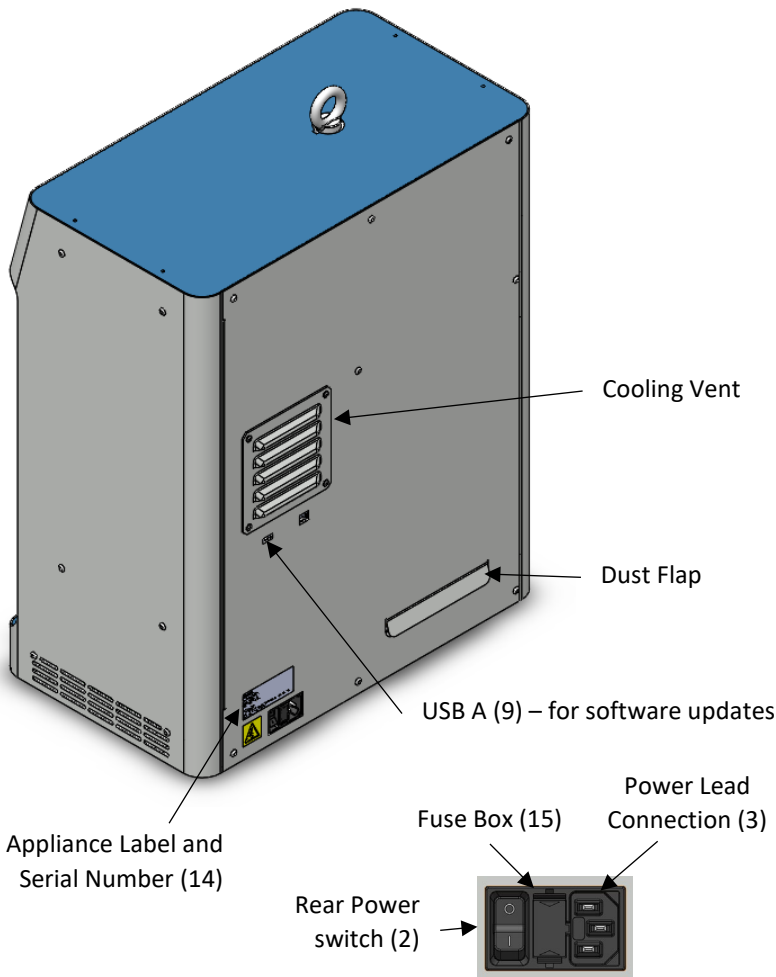
These terms apply to and form part of the terms of use and any contract between Specac Limited and any purchaser of the Apex 400 Press and when issued shall supersede any other terms. Specac Limited shall not be liable for any for any defects appearing in an Apex 400 Press sold or supplied by Specac Limited to the extent that such defects arise as a result of the purchaser or any user modifying or tampering with the goods or failing to operate the Apex 400 Press in accordance with instructions issued by Specac Limited from time to time in relation to installation, operation, storage or maintenance. All warranties other than those expressly given by Specac Limited in its conditions of sale, or which are implied and may not be excluded by virtue of an applicable statute or regulation shall be excluded to the fullest extent permitted by law.

4. Diagrams - Apex 400 Press

Front View



Back View



Legend for Apex 400 Press Diagrams

- (1)** Front On/off power switch.
- (2)** Rear power switch
- (3)** Power Lead connection.
- (4)** Touchscreen Display.
- (5)** Die Drawer.
- (6)** Die Holder.
- (7)** Lifting Eye & Hole.
- (8)** Pressure Plate
- (9)** USB A Socket
- (10)** Die Cap
- (11)** Start (apply load) button.
- (12)** Release (remove load) button.
- (14)** Appliance Label and Serial Number
- (15)** Mains fuse holder.

5. Operation - Apex 400 Press

General Procedure

The *Apex 400* press is used to apply a constant load to a sample powder contained within a die.

The *Apex 400* press can apply a load by running program which can be loaded from the **Directory**.  The press is configured with a couple of starter programs, but more can be added by the user.

When using a program, the 1st load to be applied can be quickly edited from the main screen by touching the **Adjust Load** symbol  of the Display Screen (4) and then applied when the start button (11) is pressed. A load between 40 kN to 400 kN can be set.

Programming and **Editing** the programs are explained in their own sections of this instruction manual. (Please see Section 6.)

For the procedural description of operation in how to install, press and remove a sample from an *Apex 400* press, please refer to the diagrams of the press for the part identification where mentioned.



CAUTION! *Ensure that any loads used on the press are within the maximum safety limit load of the die.*

Display Screens, Function Buttons and Symbols

Display Screens

All operations and the status of the Apex 400 press are shown on the Display Screen (4). The Display Screen has five principal types of display presentation.

These five “Display Screens” are:

- 1) Main Operation Screen
- 2) Settings Screen 
- 3) Program Directory List Screen 
- 4) Program Editing Screen 
- 5) Event Viewer 

Function Buttons

There are two function buttons on the front panel. The top green button is the start (apply load) button (11) and the red lower is the stop (release load) button (12).

Note: *The stop button (12) should be considered a general “failsafe” function button and can be pressed to **cease all operations** in running of the press **at any time** or in case of emergencies.*

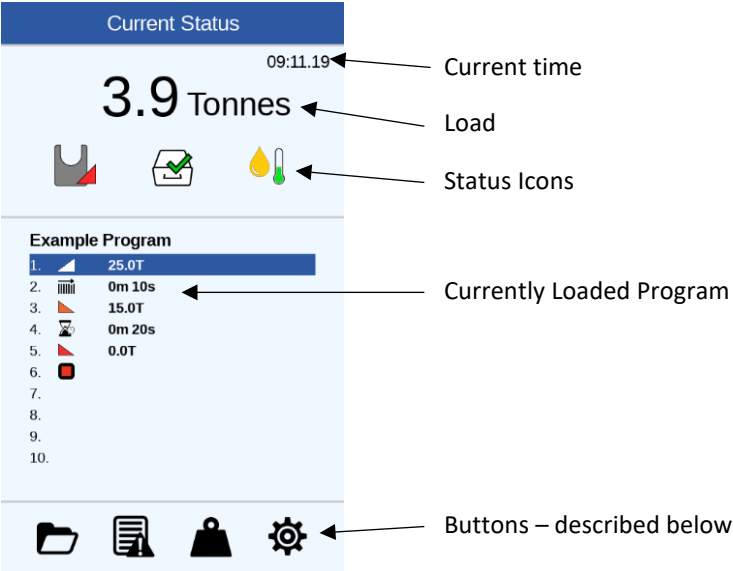
During the actual running of any program if the stop button (12) is pressed once, this action will:

- A) Abort a program if the load is actually rising or releasing.
- B) Release the load and retract the cylinder.

On rare occasions where no load has yet been applied and the program is aborted, the cylinder may take a long time to retract. 5-10 min.

Status Symbols

The following shows the main status screen and common status messages likely to be seen.



Main Operating Screen – Status Icons	
	Status Icon - The Pressure Plate is in the Sample Loading state
	Status Icon - The Pressure Plate is in the Sample Release/Eject state
	Status Icon - The Pressure Plate is moving or in transitory state
	Status Icon - Drawer is Open or Closed – The press will only run with the drawer closed
	Status Icon – Green color indicates if the oil temperature is OK.

Operation – Steps to Press a Sample

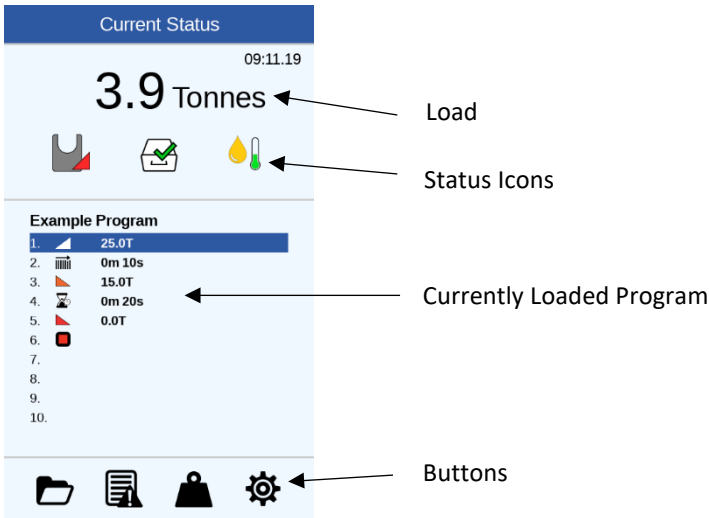
Powering up the Apex 400 Press

Connect the press to a suitable electrical supply using the supplied mains lead and plug at the rear into the power socket (3). Then switch On the rear power switch (2) followed by turning on by pressing the front power on/off switch (1). The switch illuminates red when the press is On.

From start up the display will load the Main Operation Screen. The last used program will be loaded ready for use.

Note: On first start up or if the power has been lost the press may ask for the current time to be set. This can be set or cancelled.

At initial start-up a typical operating screen will be presented as shown below.



Note: If the drawer (5) is open, the drawer symbol will be shown with a red exclamation. This means that all power to the motor has been cut to prevent any accidental operation.



Changing the Language Display and the Units of Load

The Apex 400 press language can be changed in the Settings screen.

From the main screen, touch the  followed by the .

The press can display the **Units** of load in kN, Tonnes or US Tons. This is changed in the settings screen by touching the .

Placing Work in the Apex 400 Press

After switching On, open the drawer (5).

Place the die in the drawer (5) in the support ring (6). This can be done one part at a time in this order:

1. Plunger
2. Spring
3. Die Body – slowly, taking care to align the parts and not damage them.



CAUTION: The dies supplied by Specac with the press are designed specifically for this drawer and have the correct height to be used with the press. Contact Specac before using any other die.

Place powder sample into the die cavity and fit the die top cap (10). Make sure the top cap is fitted securely.

Now close the drawer (5).

Recommended masses of sample and load are provided here, adjust mass and load to get thickness and pellet quality as needed.

Sample:	Rock	Food
Ø 32 mm die	7 g	3 g
Ø 35 mm die	8 g	4 g
Ø 40 mm die	10 g	5 g
Starting Load:	200 kN	40 kN

Applying a Load with the Apex 400 Press

Once the sample is correctly positioned and the drawer (5) has been closed, a program can be run.

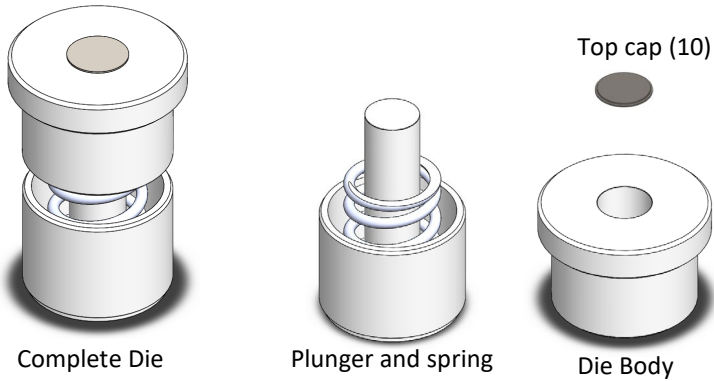
Touch the Directory symbol  to change the program.

There are two main types of die, and they require programs set up in a different way.

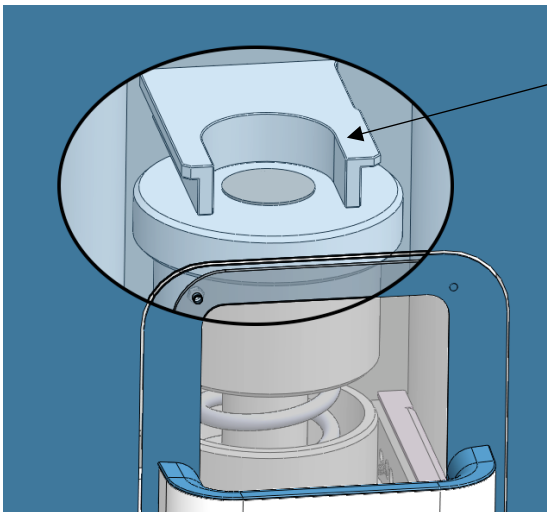


CAUTION: Applying too much load to certain sample types can cause the die to stick. Start with lower loads and increase until the pellet quality is acceptable.

Standard Die

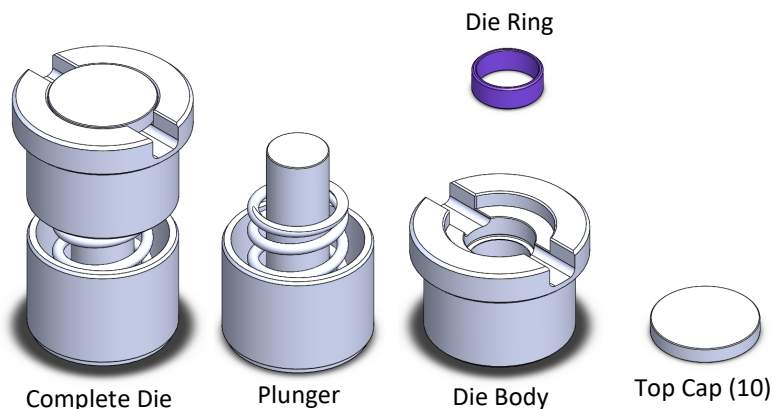


The standard die compresses the sample powder into a unsupported sample pellet or a pellet in a aluminium or plastic cup. This pellet is stuck in the die once the load has been applied. The Apex 400 press includes a pressure plate to eject the pellet. In order to do this the program must end with the Sample Eject function.



Pressure Plate (8) in Sample Eject position.

Ring Die



The ring die compresses the sample into a metal ring. This type of die is faster and does not require the Sample Eject function.

The program should end in the Stop function 

The press is supplied with a default program for each of the two types above.

Once the correct program is selected the load can be adjusted using the  button on the main screen or by editing the program directly.

The program can be run, and load applied, by pressing the start button (11)

Note: The range limits are 40 to 400 kN for the Apex 400 Press.

When the drawer (5) is closed and the start button (11) has been pressed, the press motor will start and the Display Screen (4) will show the current program step highlighted.

The press motor will slow and stop to reach the target load before moving onto the next step in the program.

Removing the Die

To remove the die it's recommended to remove each part separately as follows

1. Lift the Die Body – make sure it separates from the plunger
2. Spring
3. Plunger



CAUTION: The die body may stick to the plunger. If it does, try closing and opening the drawer to see if the movement frees up the die. If this doesn't work, press down on the top face of the die whilst it is in the drawer.

Operation – Further Features of the Press

Piston Travel

There is a maximum piston travel of 38mm, and the press motor and pump will automatically stop when this travel limit is reached. It's not normally possible to reach this limit with the Specac supplied dies unless they're not fitted or the cap on the top of the die is forgotten.



CAUTION! *If possible, it is desirable to **avoid running the press piston to the limit of its travel.***

Use of the Stop Button (12)

When the stop button (12) is pressed the press will abort the program and any pressure will be slowly relieved.

After the piston has fully retracted to its start/rest position the press will beep to show it's ready for the press to be started again.

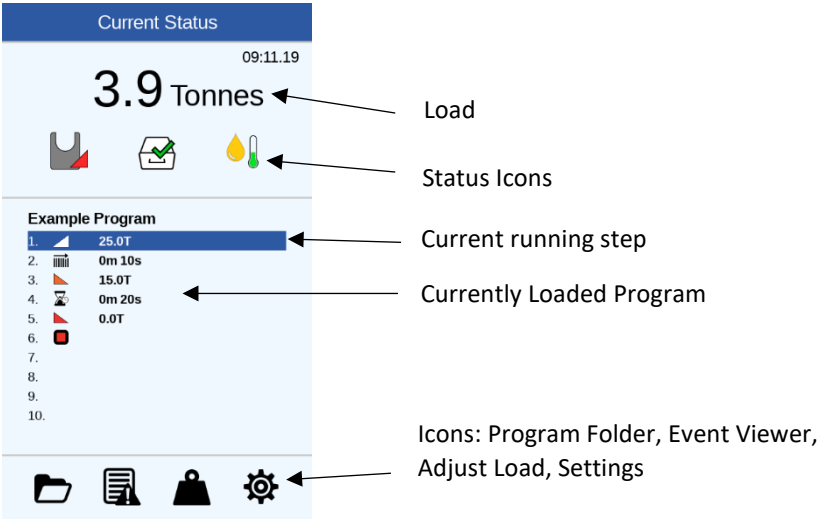
Note: In rare cases where the stop button has been pressed at no load, the piston may take a long time to return.

6. Display Screens – Operation, Options, Programming, Directory & Editing

The Different Display Screen Environments

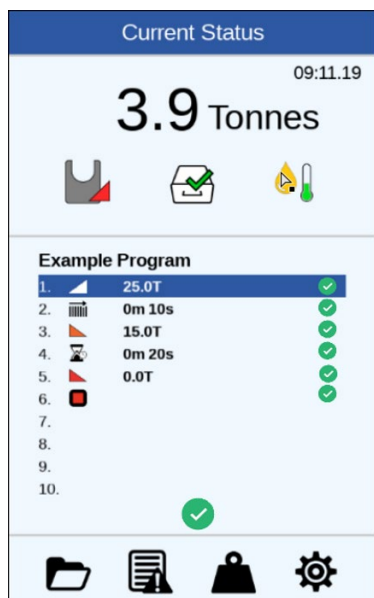
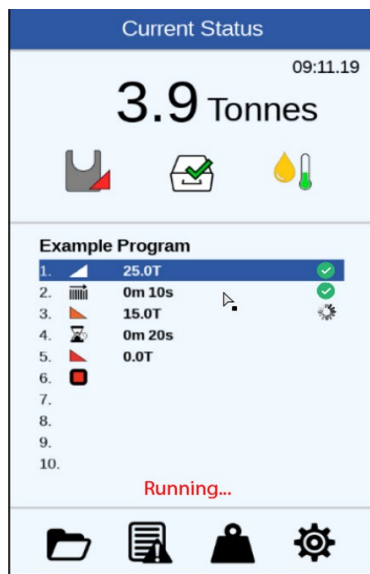
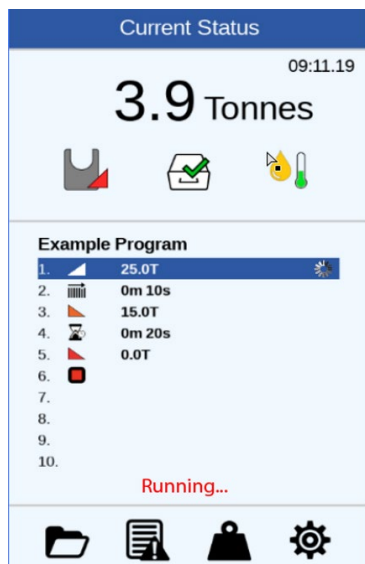
1) Main Operation Screen

The main operating screen displays the current load and status of the press. The currently loaded program is shown and if it is running the program step is highlighted, as shown below.

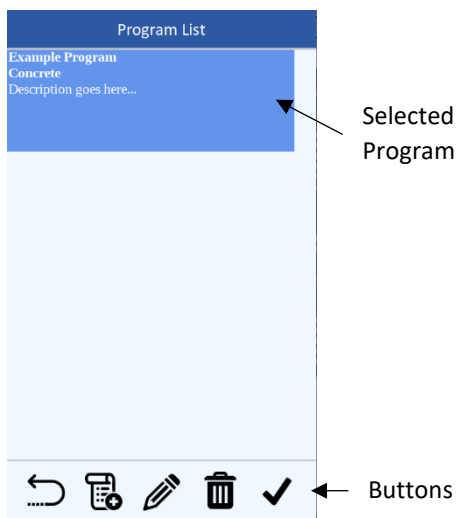


The weight icon temporarily adjusts the first load in the open program. The other 3 buttons at the bottom of the screen access the following 3 menus.

When the press is **running** the following screen will be visible. It will then show what has been completed with the **green** checkmarks and when completed another checkmark will be at the bottom.



2) Program Folder



The program folder lists all the saved programs in the press.

Click on one to select it.

There are two default programs installed on the press. One for ring dies and one for standard dies.

The buttons at the bottom of the screen are described below:

Directory Menu	
SYMBOL	FUNCTION
	Back / Return Note: This won't load the selected program.
	Create a new Program
	Edit Program Symbol - To Edit selected Program
	Delete/Erase Program or Operation
	Tick Symbol – Used to save any changes made to a program or settings.

Event Viewer



The Event viewer show a list of recent events, such as the last programs run, and any errors.

3) Settings



The settings menu has the following options explained below:

Settings Menu	
SYMBOL	FUNCTION
	Set language
	Set units – Tonnes, US Tons and kN
	Set display brightness Drag the slider left and right to adjust the brightness
	Set Clock Note: Time is lost if the power at the rear of the press is switched off. The clock is used by the event viewer.
	Update firmware First insert a USB memory stick with the firmware to update
	Change Password Enter a blank password to remove password protection. <i>Alternatively enter the override password: Specac1971</i>
	Security Settings Menu Allows the settings and program editing to be locked from access by the user.
	Buzzer - Enable / Disable an audible “beep” when a program is complete
	Factory Settings – Not for user access.

Password Protection



The change password icon allows you to set a password. Once a password is set, various features are locked and cannot be changed by the user. To remove the password leave the New Password box blank.



The features that are locked are adjustable using the security settings menu. This padlock icon.

This displays the following options:



Edit Programs – Click the padlock symbol to enable or disable the editing of programs

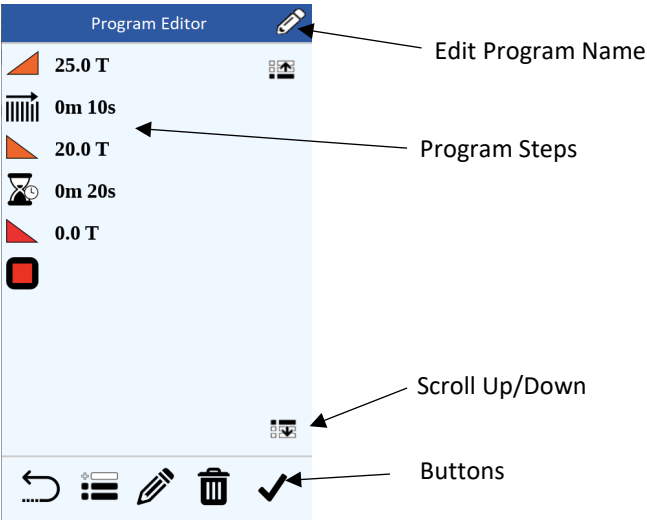


Setting – Click the padlock symbol to enable or disable editing of settings



Lock Programs – Clicking this icon opens the program folder list and allows you to lock or unlock each individual program. Locking a program

4) Program Editor



Program Editing Menu	
SYMBOL	FUNCTION
	Back / Return Note: This won't save changes if editing a program.
	Insert a program operation above the currently selected line
	Edit selected Program Step Or at the top of the program screen – the program name and description can be edited
	Delete/Erase Program or Operation
	Tick Symbol – Used to save any changes made to a program or settings.

If the insert or edit selected program step buttons are pressed a menu displays the following functions.

Program Step Functions Menu	
SYMBOL	FUNCTION
	Ramp Up to Load. This step runs the hydraulic press up to the load value set. The colour indicates motor speed. Red = Fast
	Maintain Load. This step aims to maintain the load over a period of time. The press will occasionally run the motor to keep the load constant.
	Wait This operation waits an enter time without running the motor or topping up the load. The load may slowly decrease over time.
	Ramp Down Load. This step releases the pressure and lowers the Load. Either to 0 or the value set. The colour indicates pressure release speed. Red = Fast
	End Stop Symbol – The End Stop step as the final segment in a program. This is used with Ring dies only, as it does not eject the sample from a standard die.
	Sample Release/Eject – This function is used with standard dies to eject the sample from the die as the final step in a program. It shouldn't be used with the ring dies. The colour & arrows indicate motor speed. Red = Fast

7. Non-Routine Procedures for the Press

Aborting a Pressing Procedure

To cancel the pressing program, press the red stop button (12)

The program will be aborted and the piston will retract.

As a safety feature, opening the drawer whilst the press is running will also stop the program.

Warning: If the program is stopped near the start, before the piston has extended and before much load is applied the piston may retract very slowly. This may take up to 20 minutes due to the pressure being too low for the fast return valve to open.

Work Becomes “Trapped” in the Pressing Area

If, following the completion of a pressing cycle or whilst running a program, the drawer cannot be opened, there is still a load applied to the die. Press the red button to make sure the press is aborting and piston retracting.

No Sample in the Pressing Area

If the press is operated with no die in the drawer (5), the piston will continue moving until it reaches the limit of its travel, unless aborted by pressing the stop button (12).

If the piston has been allowed to travel to its full limit because there has been no sample in the pressing area, the piston **may not return** to its natural start point/rest position. If this situation does occur, create a program with a slow speed ramp up to a small load of 40kN before ramping back down and then leave the press for 10 minutes to see if the piston has returned. If it hasn't contact Specac for assistance.

Note: If possible, avoid running the piston to the limit of its travel.

8. Fault Finding, Causes and Remedy

The Apex 400 Press should give years of trouble-free operation, if used and cared for correctly. If there is a failure of the press operation, please contact your local Specac representative immediately. Provide the serial number found at the rear of the press and provide a description of the fault. Specac may be contacted via email at techsupport@specac.co.uk.

Some faults that may develop can be identified and fixed without the potential need for return of the press. The following information is provided to identify some faults and carry out the necessary repairs and adjustments should you decide to do so.

Fault 1: There is no power to the press when the on/off power switch (1) is pressed On but power from a mains connection has been established.

Cause: The mains fuse (15) is broken or damaged.

Remedy: Replace the mains fuse with the appropriate type. The fuse is located within the mains fuse holder (15). The fuse to use is a 20mm long, 10amp, anti-surge ceramic type (P/N 254-047). FOR SAFETY, DISCONNECT THE PRESS MAINS POWER SUPPLY BEFORE REMOVING THE FUSE.

If the fault persists when a new fuse has been replaced, please contact Specac for further advice.

Fault 2: The motor/pump does not run when the start/apply load button (11) is pushed.

Cause: The press die drawer (5) is still open.

Remedy: Fully close die drawer (5). The draw icon should display a green tick. If the fault still persists when the drawer has been closed, please contact Specac for further advice.



Fault 3: The display remains blank when the press is turned On, but the power switch is illuminated.

Cause: Software failed to load

Remedy: Turn the Press Off using the rear power switch, wait 20 seconds before turning it back On. Try to see if the backlight of the display is turning on and leave it another 20 seconds to see if the software loads.

Fault 4: The touch screen doesn't respond to touch.

Cause: Touch screen calibration has been lost.

Remedy: With the press On, press and hold the Red Stop button for 10-15 seconds until a calibration screen is displayed. Follow the instructions on screen by touching the 4 targets indicated.

Fault 5: The piston doesn't retract, and an error is displayed when a program is attempted to be run.

Cause: The fast release valve hasn't opened due to an abort at no load.

Remedy: Press the red stop button (again) and wait 15 minutes to see if the piston has returned and it allows you to run a program.

Fault 6: The motor/pump runs but the pressure plate (8) does not lower (with no die in the press).

Cause A: The oil level in the system is too low.

Remedy: Check there are no signs of oil leaks. Remove the panel from the right side of the press and check the oil tank is filled between the min and max marks. Contact Specac if it not.

Cause B: The valve in front of the oil tank is closed.

Remedy: Remove the panel from the right side of the press and check the valve in front of the oil tank is open. The blue cap should be in line with the plastic pipe and not perpendicular.

Fault 7: A tonnage load can be applied but the load cannot be held and decreases.

Cause A: The sample itself is collapsing/yielding under force.

Remedy: Set the program to maintain load for 60 seconds and see if the load keeps decreasing and motor has to run continuously to hold pressure.

Cause B: There is a loss of oil (oil leak) from the system.

Remedy: Check for signs of oil under the right side of the press (possible motor/pump problem) or in the Drawer or left side (possible piston cylinder assembly problem). If there is an oil leak contact Specac and give serial number of press.

Cause C: Solenoid valves dirty or damaged.

Remedy: Contact Specac and give serial number of press.

Cause D: Pressure relief valve dirty or damaged.

Remedy: Contact Specac and give serial number of press.

Cause E: Motor/pump damaged or worn out.

Remedy: Contact Specac and give serial number of press.

Fault 8: Oil pressure in system increases but a full tonnage load capability cannot be applied.

Cause A: Oil temperature has become too hot from excessive running of the motor/pump assembly. (Oil is now too thin).

Remedy: Stop using the press for 15 minutes to allow the oil to cool down and re-apply a full tonnage load.

Cause B: There is a loss of oil (oil leak) from the system.

Remedy: Check for signs of oil under the right side of the press (possible motor/pump problem) or in the Drawer or left side (possible piston cylinder assembly problem). If there is an oil leak contact Specac and give serial number of press.

Cause C: Pressure relief valve dirty or damaged.

Remedy: Contact Specac and give serial number of press.

Cause D: Motor/pump damaged or worn out.

Remedy: Contact Specac and give serial number of press.

Fault 9: Pressing Piston will not retract.

Cause: The program running on the press has become “confused”.

Remedy: Power down the press (switch off (1)) and then re-power the

press (switch on (1)). Press the red abort button (12) and check if the piston is retracting, wait 15 minutes if needed.

Fault 10: Creaking sound when load being applied and released.

Cause: Friction movement of compression spring rings.

Remedy: Contact Specac and give serial number of press. The springs may need relubricating.

Fault 11: Damage has occurred to the pressure plate assembly above the die, and it cannot be removed from the press.

Cause: Incorrect pressing of a sample.

Remedy: Contact Specac and give serial number of press.

Fault 12: The pressure plate partially slides out with the die.

Cause: Opening the drawer before the program has finished and piston retracted fully.

Remedy: With the drawer fully open, slide the pressure plate back into the press as far as it goes. It must be supported level by the pressure plate holder. Wait for the piston to retract before opening the drawer next time.

Fault 13: The pressure plate fails to move, and an error is displayed

Cause A: Dust has built up on the pressure plate.

Remedy: Open the drawer, slide out the pressure plate. Clean with the damp cloth. Re-insert onto its guiding rails.

Cause B: The pressure plate wheel has worn out.

Remedy: Contact Specac and give serial number of press. The wheel o-rings may need replacing.

9. General Preventative Maintenance

As stated in the previous Fault Finding, Causes and Remedy section, the Apex 400 Hydraulic Presses should give years of trouble-free operation, if used and cared for correctly.

It is recommended to keep the press in as clean a condition as possible, particularly the drawer, die and pressure plate.

The pressure plate can be slid out and slid back in for cleaning purposes and should be cleaned once a month.

Checking the Oil Level and Changing the Oil

The Apex 400 Press is supplied from new filled with VG100 grade hydraulic oil. The oil reservoir right side of the press is accessible by removal of the right cover. There is a maximum and minimum oil level mark on the oil reservoir and 1 litres of oil is in the reservoir when it is filled to the maximum mark.

Depending on a typical suspected usage of the press (circa 100 pressings per day at maximum tonnage loads), Specac would recommend that the oil in the pressing system is changed every year. Change of the oil requires use of an Oil Kit of parts P/N GS25890 to carry out this procedure correctly. Contact Specac to arrange this.

Specac manufactures and stocks a full range of IR sampling accessories for solids, liquids and gases and optical components. We design and manufacture fully integrated sampling solutions for the laboratory, at line and in-line process measurement, to cope with extremes of temperature from -190°C to $+800^{\circ}\text{C}$, pressures from vacuum to 345 bar (5000psi) and corrosive conditions.

- ◆ **Single and multiple reflection ATR systems**
 - Golden Gate ATR (-150°C to $+300^{\circ}\text{C}$)
 - Quest ATR
 - Gateway ATR (up to $+200^{\circ}\text{C}$)
 - 25 Reflection ATR
- ◆ **Transmission – Fixed/Variable pathlength gas cells up to 20m**
 - Cyclone (up to $+200^{\circ}\text{C}$)
 - Tornado
 - Storm (up to $+250^{\circ}\text{C}$)
- ◆ **Diffuse Reflectance**
 - Selector
 - Minidiff Plus
- ◆ **Specular Reflectance**
 - Monolayer
 - Fixed Angle
- ◆ **Transmission – Liquids and Solids**
 - Omni-Cell
 - Pearl
 - Liquid Flow Cells
 - Variable Temperature Cell Holder (-190°C to $+250^{\circ}\text{C}$)
 - Heating Jacket (up to $+250^{\circ}\text{C}$)
- ◆ **Extreme Conditions**
 - Environmental Chamber (up to $+800^{\circ}\text{C}$, 34.5bar/500psi)
 - High Temperature High Pressure Cell ($+800^{\circ}\text{C}$, 69bar/1000psi)
- ◆ **Sample Preparation**
 - Presses and Dies (up to 40 tonnes)
 - Film Maker (up to $+400^{\circ}\text{C}$)
- ◆ **Polarizers**

11. Accessories for Apex 400 Press

Apex 400 Press Dies

Size (diameter)	Part Number
32mm Standard Die	GS2522x
40mm Standard Die	GS2522x
51.5x35mm Ring Die	GS2522x
40 x 35mm Ring Die	GS2522x
40 x 32mm Ring Die	GS2522x

12. Specifications of the Apex 400 Press

UK version part number	P/N GS25201
USA (110v,60Hz) version part number	P/N GS25202
JAPAN (100v,50/60Hz) version part number	P/N GS25203
CHINA (230v,50Hz) version part number	P/N GS25204
Max. Load on Ram (Piston)	400 kN
Load Applied Increments (Displayed to)	1 kN
Load Target Accuracy	±5kN
Load Range	40 - 400 kN
Ram (Piston) Stroke	38mm
Base Footprint (Width x Depth)	462 x 346 mm
Height	573 mm
Oil Type	VG100
Oil Reservoir Capacity	1.2 litre (Typical use 0.8 litres)
Operating Temperature Range	10°C to 40°C
Press Weight	120Kg
Package (crated) Weight	170Kg
Maximum Working Altitude	5000m
Working Temperature	10-40 °C
Humidity	0-80% RH non-condensing
Voltage and Frequency	100-230Vac 50/60Hz
Fuse Type	T10 AH, 250V

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