The Octagon Digital User Guide

Variable Amplitude Test Sieve Shaker

ISSUE 04-02

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Description

The Endecotts Octagon Digital is a vibrating shaker that is used to carry out sieve tests in conjunction with sieve stacks for particle sizing of various material samples.

It is based on an electromagnetic drive, with special non-metallic laminated springs that are set at a calculated angle to provide a horizontal twist, as well as a vertical movement to carry out efficient sieve tests.

The Octagon Digital has a digital amplitude control to vary the vibration amplitude. It also has a digital process time control and a digital intermittent time control.

The intermittent time operates within the process time so that the vibration is turned on and off during the total sieving time.The intermittent timer is controlled by an override switch to enable the shaker to operate in the continuous or intermittent mode. The Process Time and Amplitude are displayed on the same digital display. The Process Time is displayed in minutes and the Amplitude is a proportion of the maximum displacement. The maximum displacement is dependent on the number of sieves and the amount of a sample.

Setting Up

Unpacking

The shaker should be set up according to the following procedure and the picture on Page 3. The Internal packing and following items should be removed from the case and checked before assembling the 'Octagon Digital'.

1 off	Test Sieve Shaker Octagon Digital
2 off	Standard Clamp Rods
2 off	Short Clamp Rods
2 off	M12 Plated Lock Nuts
2 off	M12 Plated Plain Washers
2 off	Clamping Handwheels
2 off	Large Plain Clamp Washers
1 off	Clamp Plate Assembly complete with Locking Assemblies
1 off	Mains Lead
1 off	Instruction Manual

Remove lid and collapsible sides of packing case

Keeping top opening of packing case uppermost unscrew transit bolts from underside of pallet (placing blocks under packing will assist this operation). Lift the shaker from packing case carefully.

Take care as the Octagon Digital weighs 43 Kg

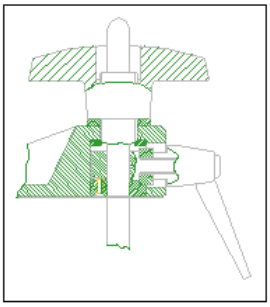
Assembly

The sieve shaker should be placed on a level surface to ensure symmetrical distribution of the sample over the sieve mesh. The surface should be rigid and robust where vibration will not cause problems to other equipment.

Clamping Assembly

Fit one M12 nut and washer onto each clamp rod selected for use, then screw the pair of clamp rods into the location plate and tighten the locknuts.

Place the two large plain washers over the 20mm threads of the clamp sleeves. These can be seen protruding vertically from the two side lugs on the clamp plate. Screw the two handwheels loosely onto the 20mm threads, leave a gap of 3mm between the large washer and the handwheel face. Do not tighten right down at this point.
See Diagram below:



Setting Up

Electrical Connections

Ensure that the voltage and frequency on the Rating Label, at the rear of the shaker correspond with the local electrical mains supply. If there is any discrepancy, please consult your supplier or a qualified electrician.

Do Not Connect to any other supply other than that stated on the Nameplate

Important – This equipment must be connected to mains earth

The Octagon sieve shaker is provided with a detachable 2 metre long mains cable which has an IEC moulded connector at the shaker end and plug suitable for connecting to the local mains supply. Certain models may be supplied with a fused plug. In the event of failure the fuse must be replaced with a fuse of identical rating.

Setting Up

Sieve Stacking

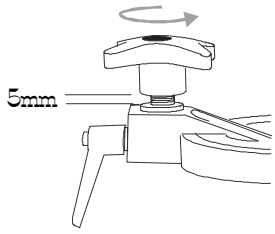
The Octagon accommodates up to the following number of sieves in a stack plus the required lid and receiver:

Diameter:	**200mm/8 inch**	**100mm/3 inch**
	8 full height (50mm)	12 full height (50mm)
	18 half height (25mm)	24 half height (25mm)

Place the receiver centrally on the location casting in the appropriate recess. Stack the required sieves on top of the receiver. Put the samples in the top sieve and fit the lid.

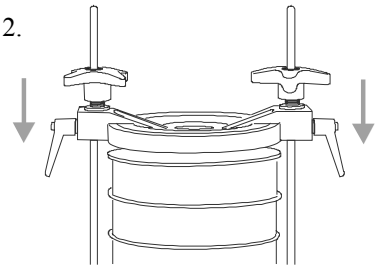
Align the locking assemblies in the two side lugs of the clamp plate with the round clamp rods. Slide the clamp plate down squarely onto the lid at the top of the sieve stack.

1.



Ensure that the clamping handwheels at the top are loose and the locking assemblies are fully pushed down. There should be a 5mm gap between the large plain washer and the face of the handwheel.

2.

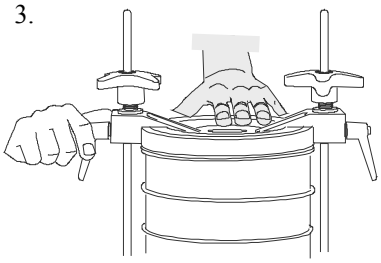


Setting Up

Sieve Stacking

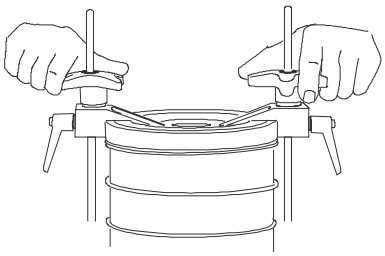
Place one hand on the top of the clamp plate and hold square while locking one side handle lever. Repeat for the opposite side handle lever.

3.



The side handle levers can be set vertically downwards by pressing on the Red button and pulling the handle outwards to release. Turn the handle to a safe, convenient angle downwards and release to engage the teeth.Screw the two clamping handwheels down simultaneously to ensure the clamping plate is square. Continue until the handwheels are tight against the internal stop. Hand tightness must be exerted so that the assembly does not loosen during vibration.

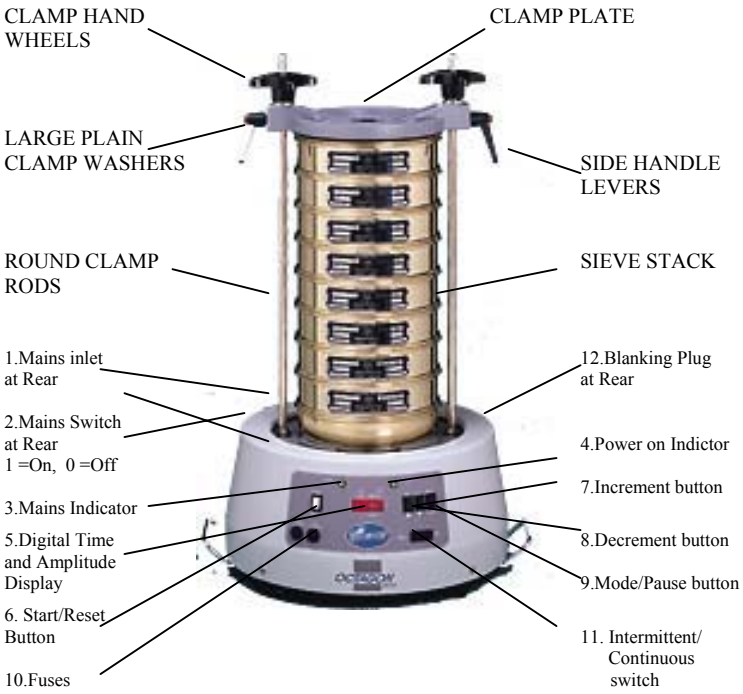
4.



The locking side handle levers and clamping handwheels must be tightened sufficiently to ensure that the sieves and receiver are clamped securely during operation. Damage may occur if the shaker is allowed to operate with a loose clamping plate.

Position of Controls

Operators should be familiar with, and fully understand the controls and indicators before operating the machine. This should be done in conjunction with the diagram below:



Function of Controls

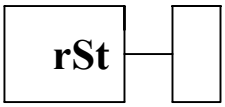
1. **Mains Inlet** Mains power connection with an integral line filter. Ensure the IEC connector on the mains lead is pushed fully into the mains inlet at the rear of the machine.

2. **Mains Switch** This controls the electrical power on the equipment. The side marked 1 is On and the side marked O is Off.

3. **Mains Connected Indicator** This is a green l.e.d. that indicates electrical power is connected to the equipment, even though the Mains switch (2) is not in the on position. The green l.e.d. is illuminated when the IEC connector is pushed fully into the inlet and power is connected at the local outlet. If the l.e.d. fails to light with the switch in the On position then Fuses (10) may be blown or power is not present at the mains.

4. **Mains Power Indicator** This is a green l.e.d. that indicates that power has been switched on by the mains switch at the rear and the shaker is ready to start operation or is in an operative state. The green l.e.d. is illuminated and the Digital Display (5) will be energised. Ensure that the Digital Display shows a preset time and amplitude setting before pressing the Start/Reset push button.

If the display shows:



The Start/Reset button must be pressed once to be reset the system and display the preset time and amplitude. This is a safety feature to inhibit the shaker vibrating when first switching on or if the mains power fails and then returns. The test is aborted when this occurs and must be restarted.

5. **Digital Time and Amplitude Display** The first three digits display the preset process time of the sieving operation, and the fourth digit displays the preset amplitude. The process time may be varied from 0 - 99.9 minutes, and the amplitude from 0 - 9 as a proportion of the maximum amplitude. The display also has two l.e.d.'s to indicate Mode and Pause functions. During the running countdown time the Mode/ Pause button may be pressed to stop the shaker vibrating and pause the countdown time. The Pause l.e.d. is illuminated when this is activated. Pressing the button once again will resume the shaking operation and also the countdown time.

Function of Controls

The Mode l.e.d. is illuminated when the Mode/Pause button is pressed when the shaker is in Standby mode. This is to enable programming the preset process time, the preset cyclic times and the preset amplitude. Note: Maximum amplitude is dependent upon the number of sieves and weight of the sample.

Maximum Process time	99.90 mins
Maximum Off time	99.00 secs
Maximum On time	99.00 secs

6. **Start/Reset Button** The Start/Reset button initiates the running of the shaker and starts the countdown of the process time. When the Start/Reset button is pressed once the timer starts counting down and vibration commences. Pressing the Start/Reset button again will reset the time to the preset time and stop vibration. This aborts the test that is being carried out at the time.

7. **Increment Push Button** This selects the preset time and amplitude level on an incremental basis. Pressing the button once increases the digit setting once each time. Holding down the button will increase the digits rapidly to the required setting.

Function of Controls

8. **Decremental Push Button** This selects the preset time and amplitude level on a decremental basis. Pressing the button once will decrease the digit setting once each time. Holding down the button will decrease the digits rapidly to the required setting.

9. **Mode/Pause Button** This is a dual function button. In the Mode function it is pressed once to enter a sequence to program the preset process time, preset cyclic times and the amplitude setting. This is done when the shaker is in standby waiting to start. In the Pause function it is pressed once to pause the shaker when it is running and the process time is counting down. Pressing the Pause button again will resume the shaker operation. In each function the appropriate l.e.d. is illuminated to indicate that function.

10. **Fuses** These are quick acting, 1¼ inch long ceramic fuses that protect the electrical components in the equipment. It is important that the recommended current rating is not exceeded (2 Amperes for 230 volts, 4 Amperes for 110 volts) and the fuse is replaced with the same type and size. If the fuse blows after replacement then a fault exists in the equipment which must be rectified.

Function of Controls

11. **Intermittent/Continuous Switch** This selects intermittent or continuous vibration. When the Intermittent function is selected, the shaker will switch on for the preset **On** time and off for the preset **Off** time. These times are programmed into the timer when the Mode button is pressed when the shaker is in Standby mode. They are only displayed at the time of programming and not while the shaker is operating.

12. **Blanking Plug** This is removed and the threaded hole used as a spillage outlet drain for wet sieving applications. An optional wet sieving kit is available, and may be purchased separately. The kit includes a nylon hosetail for connecting a hosepipe.

Operation

IMPORTANT NOTICE
THE FREQUENCY SETTING ON THE DISPLAY
MUST MATCH THE LOCAL SUPPLY FREQUENCY
FOR EFFICIENT TESTING

Always ensure that the shaker is in Standby mode when removing or placing sieves on the shaker. This can be ascertained when the decimal point is not pulsing and the display is not counting down at that time. No attempt must be made to remove sieves while the shaker is vibrating. Take care when operating in the Cyclic mode that the shaker is not in an Off cycle.

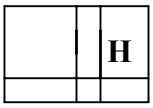
Connection Plug the mains cable into the Mains Inlet (1) and into the electrical power supply socket. Place sieves onto the shaker as described in Sieve Stacking, turn the power on at the power supply socket.

The Mains l.e.d. (3) will be illuminated.
Switch on the Mains switch (2).
The Power l.e.d. (4) will be illuminated.

Frequency Setting This display will first show the frequency that the machine has been set to on the first two digits. This will be “50” or “60” corresponding to 50Hz. or 60z. supply frequency respectively, for 2 seconds. If the wrong frequency is displayed for the local supply, the following procedure must be carried out before commencing any tests.

Switch off the power on the Mains switch. Press and hold down the Mode/Pause and Dec. buttons and switch on the Mains switch.

Keep the buttons pressed down and observe the display to show the set frequency, then all “8’s” on the digits. Release the buttons. The display will show ‘H’ on the last digit, as illustrated below:



Select INC. for 60Hz. or DEC. for 50Hz. for the local mains supply frequency. This will initialize the program to run the appropriate routine for the frequency selected. The display will then switch to the last preset time and amplitude that was set.

If the display show “rSt” this indicates that the Start/Reset (6) button is in the Run mode and must be pressed once to reset the system and display the preset time and amplitude.

Process Time Setting Press the Mode/Pause (9) button once, the Mode l.e.d. will be illuminated, and the display will show the first two digits for full minutes.

Press the lnc. (7) button once to increase the preset time by one digit each time. Holding down the inc. button will steadily increase the setting at 3 digits per second. When the display reaches “99” it will roll over to “00” and carry on increasing.

Press the Dec. (8) button once to decrease the preset time by one digit at each time. Holding down the Dec. button will steadily decrease the seting at 3 digits per second. When the display reaches “00” it will roll over to “99” and carry on decreasing.

Press the Mode/Pause button once and the display will show the third digit for tenths of a minute.

Press the lnc. button once to increase the preset time by one digit each time. Holding down the lnc. button will steadily increase the setting at 3 digits per second. When the display reaches “9” it will roll over to “0” and carry on increasing.

Press the Dec. button once to decrease the preset time by one digit each time. Holding down the Dec. button will steadily decrease the setting at 3 digits per second. When the display reaches “0” it will roll over to “9” and carry on decreasing.

Amplitude Setting Press the Mode/Pause pause button once again and the display will show the fourth digit for the amplitude level.

The lnc. and Dec. buttons can be used as before to increase or decrease the setting. The settings of "0" to "9" are proportional to the maximum level of 3.4 millimeters on 50 Hz. and 2.5 millimeters on 60 Hz. The maximum level is achieved when there is a full stack of sieves and a substantial amount of the sample for sieving.

Cyclic Time Setting Press the Mode/Pause pause button once again and the display will show the first two digits with the fourth digit showing a vibrating symbol to indicate the On time. This is now in the Cyclic Time Setting in seconds.

The lnc. Dec. buttons can be used as before to increase or decrease the setting.

Press the Mode/Pause pause button once again and the display will show the first two digits with the fourth digit showing a steady symbol to indicate the Off time.

The lnc. Dec. buttons can be used as before to increase or decrease the setting. The cyclic time can be set from 1 to 99 seconds. Thus, when the digits roll over they will go from "99" to "1" and vice versa.

Press the Mode/Pause button once again and the display will revert to the beginning showing all four digits and the Mode l.e.d. will extinguish.

The display will now show the new preset process time and amplitude that were set. These settings together with the cyclic times will be stored in memory for repeat tests. Only one set of times and amplitude can be stored in the memory and is over-written when the above procedure is carried out. The memory is non-volatile, all data is retained even when power is switched off.

Shaker Tests Press the Start button to commence operation of the shaker. The decimal point will start pulsing on and off every second and the digits will count down every 6 seconds or one tenth of a minute. The fourth digit displays the amplitude setting for reference. Press the lnc. or Dec. buttons to increase or decrease the amplitude during the test. When the count reaches zero, the shaker will stop vibrating and the decimal point will stop pulsing. The shaker is now in the idle mode.

Reset Press the Start/Reset button once to reset the display to the last preset time and amplitude from memory.

Standby The shaker remains in the Standby mode until the Start/Reset button is pressed once.

Pause Press the Mode/Pause button once to pause the test and suspend the countdown. Press the Mode/Pause button once to resume the test and the countdown.

Cyclic Tests The lnt/Cont (11) switch may be switched from continuous to intermittent at any time. This will cause the shaker to be operated in the Cyclic mode according to the **On** and **Off** times that were last set. In the intermittent mode the cyclic times operate within the process time and are not displayed during the shaker tests. When the process time reaches zero, the shaker stops vibrating and the decimal point stops pulsing.

Press the Start/Reset button to reset the display to the last preset time and amplitude.

Press the Start/Reset button to repeat the test.

Removal of Sieves Ensure that the shaker has stopped vibrating by observing that the decimal point is not pulsing. Press the Start/Reset button to display the preset time and amplitude. Unscrew the two clamping handwheels and the two side handle levers on the clamp plate. Pull the clamp plate up the rods by the handwheels to remove. The nest of sieves may now be removed and the retained samples analysed.

Note: Ensure the shaker is not in the Cycle Time Mode and decimal point is not pulsing before removing sieves.
Do not unscrew clamping handwheels or side handle levers while shaker is vibrating.

Wet Sieving

IMPORTANT NOTICE

WET SIEVING WITH ENDECOTTS SHAKERS

All shakers are electrically operated and it is therefore important to ensure that the liquid used in wet sieving operations NEVER comes into contact with the shaker mechanism or input terminals. Endecotts machines are supplied with a spillage drain for minor spills. The drain is not intended to be used for overflows or external water sprays.

This Wet Sieving accessory is supplied for use with Endecotts Test Sieve Shakers and should only be used by qualified personnel.

It is recommended that the mains power supply is via a residual current device (Power Breaker). If there is any doubt with respect to the use of this equipment contact a qualified electrician IMMEDIATELY.

Extreme care should be taken to avoid contact with the shaker, or any electrical part of supply in operation at any time.

In the event that water spills into the shaker DO NOT TOUCH THE SHAKER. With dry hands switch off the supply at the mains and disconnect the mains supply. The shaker should be allowed to dry out thoroughly and examined by qualified personnel before further use.

Should wet sieving be a routine procedure then consideration should be given to the possible use of a remote controlled system.

Caution: It is important when wet sieving that this equipment is connected to mains earth.

Wet Sieving Adaptor Kit

The Wet Sieving Adaptor Kit is supplied as an optional extra for 8” or 200mm diameter sieves and should be ordered separately.

The Wet Sieving Adaptor Kit consists of the following items:

1 Off	Special Wet Sieving Clamp Plate.
1 Set	‘O’ Ring Seals. One required for each sieve in the stack.
1 Off	Special Wet Sieving Receiver. (Specify for 200mm or 8in. diameter sieves)
1 Off	Nylon Hosetail.

The Blanking Plug (12) at the rear must be removed and the nylon hosetail fitted. The hosetail must have a suitable length of hose fitted to drain into a convenient drainage point. The ‘O’ ring seals are fitted on the outside of the bottom rim of each sieve so that when the sieves are stackd onto each other they form a seal. The bottom sieve is stacked on the special receiver with a spout. Fit a suitable length of hose to the spout to drain into a convenient drainage point. The clamp plate is usually supplied with the rose reversed to avoid damage. Undo and reverse, so that the rose head is on the inside. Remove the lid from the sieve stack and replace the standard clamp plate with the wet sieving clamp plate. Fit a suitable length of hose to the inlet of the rose on the clamp plate and connect to the fluid supply with flow regulation.

Maintainance

The Endecott's Octagon Digital sieve shaker is completely maintenance free other tan keeping external surfaces clean.

Cleaning Cleaning must be done with the mains power switched off and the cable disconnected. Cleaning should be done by wiping with a soft cloth, dampened in a dilution of water and a mild detergent.

Do not use any solvents for cleaning

Fuse Replacements Should a fuse require replacement this must be of the same type and rating as the original. There are two fuses one in the Live and one in the Neutral line of the mains supply. The rating of the fuses are marked on the labels above the fuses and are of a quick acting type (F). Switch off the mains supply at the local supply outlet and on the shake. Remove the IEC connector at the rear of the shaker. Unscrew the central cap of each of the fuseholders with a suitable coin or screwdriver, extract the holder and the fuse together. Remove the blown fuse or fuses and replace with a new fuse in the metal retaining spring within the cap. Fit the cap and fuse back in the holder and screw in fully.

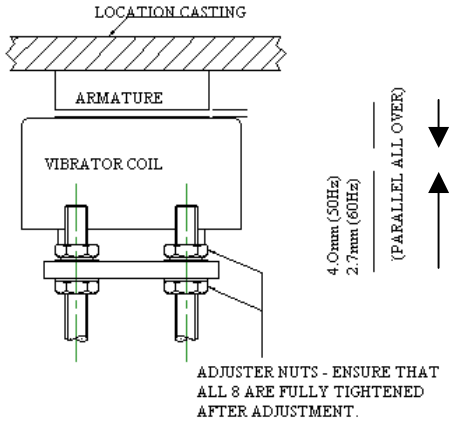
Do not over tighten !

Adjustment of Air Gap

The air gap between the pole pieces of the vibrator coil and the armature is factory set and should not need resetting. However, in the unlikely event of the airgap requiring resetting the gap must be set as follows:-

4.0mm	50 Hz Shakers
2.7mm	60 Hz Shakers

This is done by using feeler gauges and adjusting the height of the vibrator coil with the eight nuts, until the gap is set parallel. It is important that these nuts are adjusted to give a parallel gap across the pole pieces for correct operation of the shaker (see diagram)



Maintainance

Adjustment of Air Gap

In order to adjust the air gap remove the cover as follows:-

1. Remove the two clamp rods.
2. Remove the four cover screws and the blanking plug, labelled ‘SPILLAGE’.
3. Release the mains switch. It is a snap fitting and can be gently levered out with a flat bladed screwdriver. Do not disconnect leads leave the switch hanging loose.
4. Lift up the rear and rotate the cover assembly simultaneously a little to the right, taking care to clear the electrical components at the control panel over the location casting.
5. Disconnect the vibrator coil cable from the vibrator controller connector plug (brown & blue wires), and the earth from the PCB mounting stud.
6. Disconnect the earth connection from the cover assembly to the base casting.
7. The cover assembly may now be completely removed.
8. To re-assemble shaker reverse the order of 1 to 7 above.

GENERAL ADVICE

Endecotts shakers are fully tested and factory checked before shipping to customers. No parts require lubrication or resetting unless disturbed.

The sieve shaker has been constructed and factory tested to ensure correct operation when connected to the specified electricity supply indicated on the machines rating plate.

Use of unapproved spares or any alteration to the machine would invalidate all warranties and compliance with European directives for 'CE'Marking.

Endecotts Ltd does not accept any responsibility if the operating instructions contained in this manual are not strictly followed.

Specification

Model:	Octagon Digital	
Voltage:	230	110
Frequency:	50 Hz	60 Hz
Phase:	1	1
Power Consumption:	300 VA	300 VA
Class:	1 (earthed)	1 (earthed)
Vibrations Speed:	3,000 per minute at 50 Hz	
	3,600 per minute at 60 Hz	
Max. Amplitude:	3.4mm at 50 Hz	2.5mm at 60 Hz

(The maximum amplitude depends on the number of sieves in the stack and the amount of sample used.)

Process Time:	0 to 99.9 minutes	
Cyclic Time:	Off Time	1 to 99 seconds
	On Time	1 to 99 seconds
Display:	Digital 0.3" l.e.d.	
Memory:	Non volatile. One set of data stored	
	i.e., process time,	
	On and Off cyclic time and amplitude level.	

Specification

Sieve Diameters:	200mm or 8”	100mm or 3”
Max. No of Sieves in Stack:		
	8 Full Height	12 Full Height
	18 Half Height	24 Half Height

(Recesses in location casting will also accept 150mm, 6 inch and 4 inch diameter sieves.)

Operating Temp:	5 to 35º c
Storage Temp:	0 to 40º c
Humidity:	35 to 90 % RH
Dimensions:	730mm High (including rods)
	410mm Diameter (handles 2 x 35mm)
Weight:	43 Kg

All replacement parts must be ordered by quoting the shaker serial number and the correct part number.
Part numbers can be obtained from our sales or technical department.

Endecotts policy is one of continuous development and we reserve the right to modify future models.

The Octagon is fully EMC and LVD compliant and complies with all relevant European directives.