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Wheel Pressure .275

2 Measurement method

The Autoline 300 profile measuring station is intended for measuring various properties of a profile test strip taken across the machine direction. The profile test strip shall be 295 - 307 mm wide and shall be cut out by means of the L&W SE 148 Profile Sample Cutter. To guide the measurement, profile measuring programs are set up in the station computer. The properties that are to be measured, the distance between measurement points, etc. are specified in the measuring programs. The grade definitions are also entered in the computer.

A measurement series must be defined before measurement. This involves entering the source of the test piece, the grade involved and the profile program which is to be used.

The sample strip is placed in a container, and its end is fed into the profile measuring station. When a measurement series is started, the strip is fed automatically up to the first measurement position. Measurement and feeding of the test strip in accordance with the selected profile program are then carried out automatically.

Measurement with automatic feed can also be carried out on sheets which are at least 400 mm long.

Sheet measurement can also be carried out by the sheet being placed manually in an instrument.

3 Instrument description

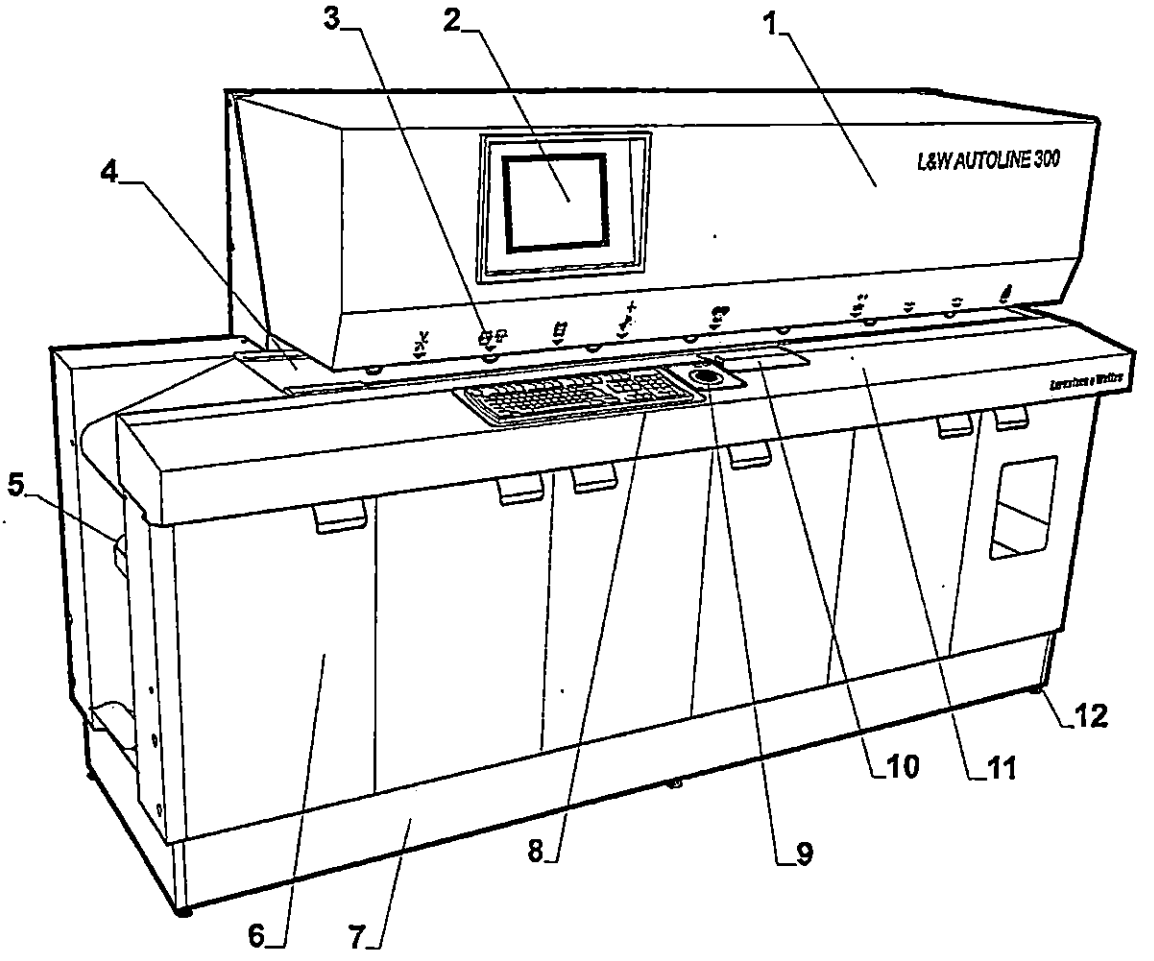
The measurement bench consists of a frame in which the following units are mounted:

- Profile measuring station computer with monitor, keyboard and trackball.
- MSU-300 system unit.
- Measuring modules in accordance with the order.

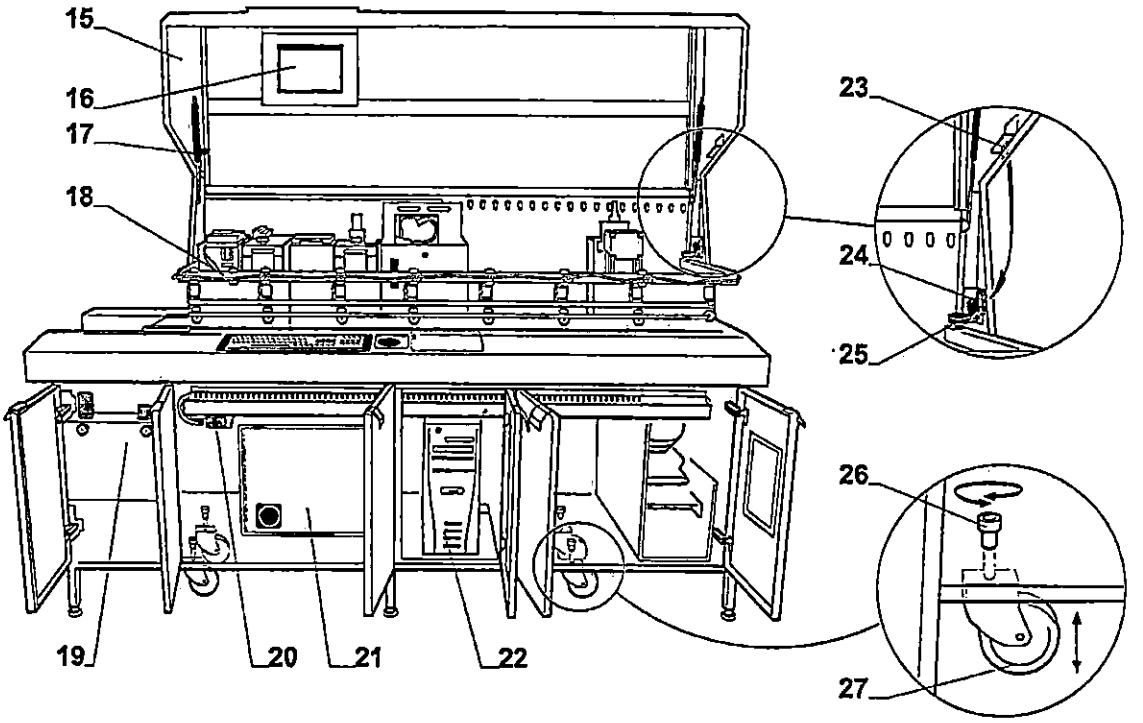
The measurement bench also contains the following:

- Feed mechanism that feeds the test strip into the profile measuring station.
- Equipment for supplying power to the various components of the profile measuring bench.
- Equipment for supplying compressed air to the various parts of the profile measuring bench.

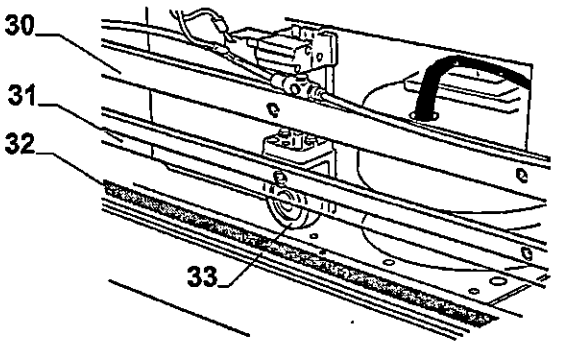
! **To safeguard good circulation of cooling air, the distance between the measuring bench and the nearest wall must not be less than about 100 mm.**



1	Hinged hood	7	Base plate
2	Monitor screen (touch screen)	8	Keyboard
3	Instrument symbol, with the arrow marking the centre of the instrument	9	Trackball
4	Opening for feeding the sample strip	10	Cover for replacing the backgrounds of the colour meter
5	Container for sample strip	11	Front casing (can be pulled forward and lowered)
6	Door (total of 6)	12	Adjustable foot (total of six)



15	Hood in raised position	22	Computer
16	Monitor lowered into the service position	23	Key for safety lock, fixed
17	Gas spring with latch to keep the hood in raised position	24	Safety lock
18	Guard frame	25	Screw for locking the guard frame (two)
19	Compressed air supply equipment	26	Screw for raising and lowering the casters (four)
20	Amplifier for optical sensors	27	Casters for moving the profile measuring station (four)
21	MSU-300 system unit		



30	Guard frame	32	Drive belt
31	Guard in the raised position	33	Pressure roller (eight)

3.1 Feed mechanism

The sample strip is fed by an endless drive belt located so that it drives one long side of the sample strip. Seven pneumatically actuated pressure rollers are located above the drive belt. When the end of the sample strip is fed into the profile measuring station, it will be detected optically and the first pressure roller will be lowered to press the strip down onto the belt. When measurement is started, the belt starts and feeds the strip to the first measurement position.

When the end of the strip has passed the next pressure roller, this roller will be lowered and the first roller will be lifted. The end of the strip is drawn in this manner through the profile measuring station by one of the pressure rollers pressing it down onto the drive belt. A drive roller and a pressure roller at the centre of the strip are located after the last measuring module. The drive roller with pressure roller feed the sample strip when the end has been fed through the profile measuring station. When all measurements on the sample strip have been completed, the strip is discharged from the profile measuring station. It is advisable to place a collecting container at the right-hand end wall of the bench in order to collect the tested sample strips.

A finger guard is provided in front of the pressure rollers, and this guard is at the bottom of its travel when the sample strip is being fed and measurements are in progress. The guard also serves as a guide for the sample strip during measurement. When carrying out measurements such as on a sheet which is not fed automatically, the guard can be lifted by pressing the **Guard button** in the basic image of the PC program.

The guard and pressure rollers are mounted on a guard frame which can be raised for inspecting and servicing the instruments.

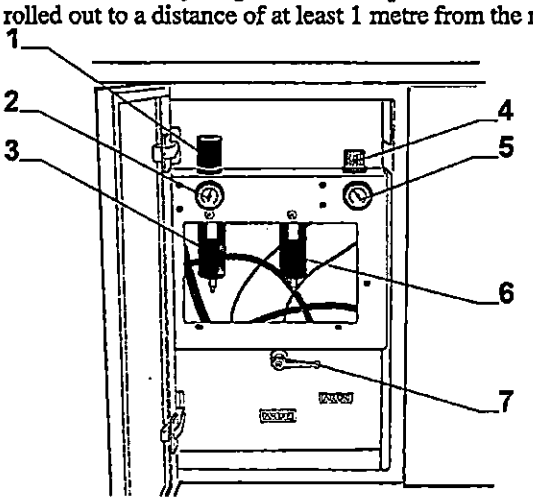
3.2 Power supply

The profile measuring station is connected to the mains power supply at a central socket located at the left-hand rear end of the bench. Connect the bench to a well stabilized and transient-free supply with protective earth. Check that the power supply voltage is in accordance with the rating plate on the equipment. The power supply should be protected by a 10 A fuse.

Make sure that the power supply cable is sufficiently long to enable the profile measuring station to be rolled out at least 1 metre away from the nearest wall.

3.3 Compressed air supply

Connect the profile measuring station to a supply of filtered and dry compressed air at a pressure of 0.6–1.0 MPa. The connection is provided at the left-hand rear end of the bench. Regulators with pressure gauges, filter and compressed air main valve are located on the inside of the door, at the extreme left of the bench. Make sure that the supply hose is sufficiently long to enable the profile measuring station to be rolled out to a distance of at least 1 metre from the nearest wall.



1	Regulator for incoming compressed air (preset to approx. 0.6 MPa)	5	Pressure gauge for the compressed air to the pressure rollers
2	Pressure gauge for incoming compressed air	6	Filter for measuring air (normally concealed by a panel). The filter mesh is 0.01 µm
3	Filter for the incoming compressed air (normally concealed by a panel). The filter mesh is 5 µm	7	Main valve for the compressed air supply to the profile measuring station
4	Regulator for the compressed air supply to the pressure rollers (preset to a minimum of 110 kPa)		

The compressed air supply can be shut off by means of the main valve. When the valve is closed (AIR OFF) the air system in the pro-

file measuring bench is not pressurized. From the main valve, the compressed air flows to a regulator with filter and water collector. The regulator should be preset to around 0.6 MPa. To adjust the regulator setting, withdraw the regulator knob and set the pressure to the required value. Then press the knob back in again to lock the setting.

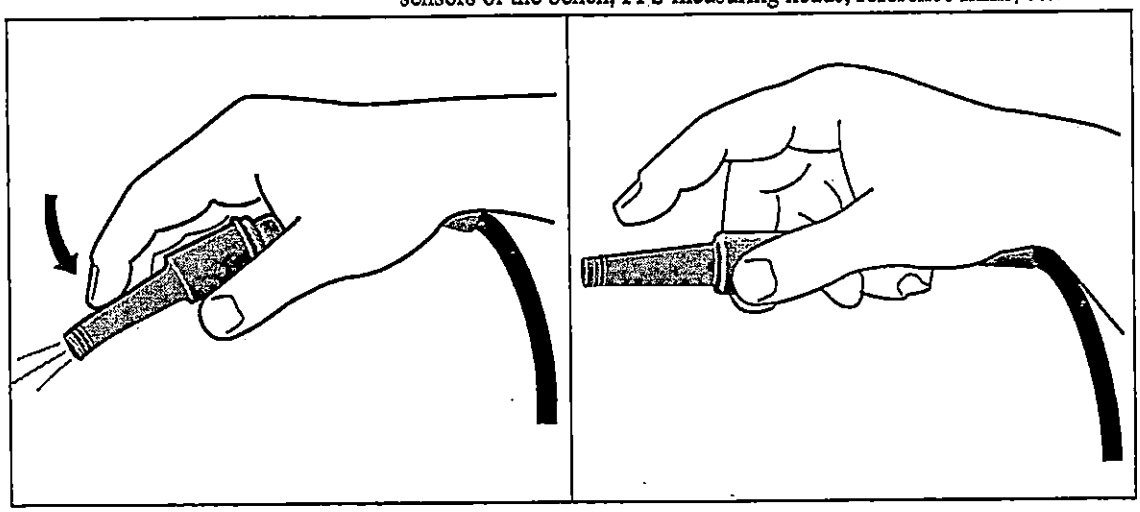
The air that actuates the paper feed pressure rollers is controlled by a special regulator. For thin paper grades, set the pressure to a minimum of 110 kPa. For thicker grades, increase the pressure until reliable feed is obtained. To reset the regulator, withdraw the regulator knob, set the pressure to the required value, and then press the knob back in to lock the setting.

The compressed air used as measurement air in the instrument for measuring the roughness and air permeance is filtered in an additional fine filter.

For particulars of filter care, see the section under **Inspection and maintenance**.

3.4 Cleaning air nozzle

A cleaning air nozzle is connected on the inside of the second inspection door from the left. The nozzle is provided for cleaning the optical sensors of the bench, PPS measuring heads, reference films, etc.



To open the nozzle, bend the tip down, and to close it, release the tip.

3.5 Installation

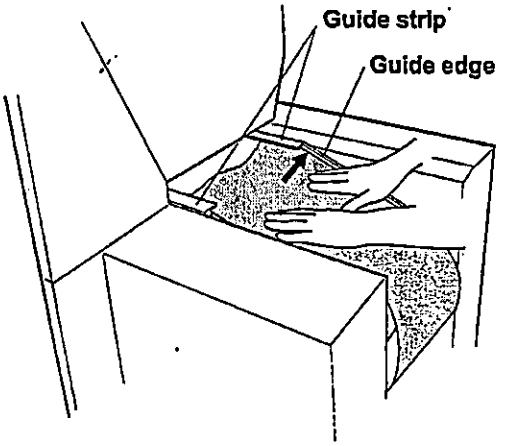
The profile measuring station should normally be installed in an air conditioned laboratory and should be connected to compressed air and electric power supplies. The profile measuring station can also be

connected to a master computer for transmission of measurement data and downloading of measurement series definitions.

4 Operation

4.1 Measurements on a sample strip

Place the rolled-up strip (295–307 mm wide) in the container in the left-hand end of the bench, so that the top side of the strip faces upwards when the end is fed into the profile tester. Pull the end of the strip up towards the entry and feed it in under the two guide strips. N.B. *The right-hand edge of the strip must be guided by the guide edge of the bench.* Feed the end in further.



When the strip has been fed in around 100 mm, the first pressure roller will be lowered and will hold the strip against the stationary drive belt. (This presupposes that automatic retention of the paper has been selected with the Paper button in the basic image of the PC program.)

Sample strips of heavier grades must not have excessive curl.

When the sample strip is in position, profile measuring will be started by the computer program. The drive belt starts and feeds the sample strip to the first measurement to be carried out in accordance with the selected profile measuring program.

4.2 Measurement on sheet

Measurement on sheet can be carried out in one of the following ways:

- If the sheet is 295–307 mm wide and at least 400 mm long, it can be handled by the automatic feed mechanism. Measurement with automatic feed on a sheet presupposes that a special profile measuring program is set up for this measurement.

  The sheet is fed in as described above for measurement on a profile sample strip.

- To carry out individual measurements on a sheet, the sample can be placed manually in the required instrument. Touch **Guard** in the basic image to lift the finger guard. Place the sample centrally in the required instrument. The centre of every measuring module is marked with an arrow at the front of the hood. Measurement is then carried out as a manual measurement from the PC program.

5 Inspection and maintenance

Lift the hood over the measuring modules by standing in front of the profile measuring station and lifting the front of the hood with both hands. **Raise the hood as far as it will go.** The hood will be held in the raised position by two gas springs. The left-hand gas spring has a latch. The monitor is mounted in such a manner that it can be lowered when work is being done with the hood open. Release the catch at the bottom of the monitor, and lower the monitor when the hood is raised.

To prevent personnel injuries, the profile measuring bench is equipped with a safety lock. **When the hood is raised, the compressed air supply to modules that could cause injuries is interrupted.** For service work that must be done with the hood raised and the measuring instruments operative, a separate service key for the safety lock is delivered with the profile measuring bench.

! **Take extra care when operating the instruments with the hood raised and the safety lock opened with the service key.**

! **Before the hood is lowered, the service key must be removed from the lock and the monitor must be raised back up again and locked with its latch. Release the latch of the left-hand gas spring by pulling the black plastic ball to the right, at the same time carefully lowering the hood.**

5.1 To raise the guard frame

The guard frame can be raised for allowing access to the measuring modules for inspection and service. Start by raising the large hood that covers the measuring modules. The guard frame is kept in the lowered position by two screws with plastic knobs, one at each end of the bench. Start by pressing down one side of the frame with one hand and unscrew fully the retaining screw on that side. When both screws have been released, the guard frame will be raised automatically by a gas spring.

5.2 To move the profile measuring station

On casters

The profile measuring station is equipped with four casters. The casters are normally retracted, and the bench rests on its six adjustable feet. To gain access to the rear of the profile measuring station, for instance, lower the casters and the profile measuring station can then be moved a short distance.

! **The casters may be used only for short distances on a smooth surface.**

The screws for lowering the casters are fitted in the base plate of the profile measuring bench, on the inside of the doors. Use the tool supplied to turn the screws clockwise. Turn the screws alternately until the profile measuring station rests with the load distributed uniformly onto the four casters.

When measurements are being taken, the profile measuring station must always stand on its six feet. Raise the casters by turning the screws anti-clockwise. After the measuring bench has been moved, check that it is level and that it rests on all six feet. If necessary, adjust the feet.

Using a pallet transporter or forklift truck

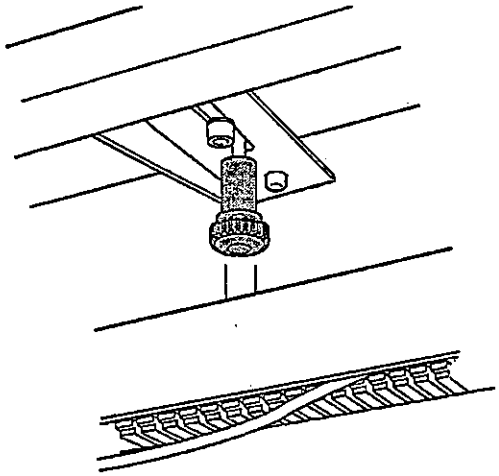
If the profile measuring station is to be transported a longer distance, it can be lifted by means of a pallet transporter or forklift truck. Before lifting, remove the two front skirting plates and possibly also the skirting plates on the ends of the bench.

! **Make certain that the sturdy square beams of the frame are being used for lifting.**

! **To safeguard good circulation of cooling air, the distance between the measuring bench and the nearest wall must not be less than about 100 mm.**

5.3 To open the front casing

The front casing in which the keyboard and trackball are mounted can be pulled forward and lowered to provide better access to the instrument panels, etc. The casing is secured by means of two socket screws fitted behind the third and fifth doors from the left-hand end of the profile measuring station. If the screws are backed off only half a turn, the casing can be pulled forward so that the panels of the measuring modules will be accessible.



If better access is required, release the socket screws fully, to enable the casing to be pulled forward and then lowered. Note that all doors must be closed or removed to enable the casing to be lowered.

5.4 To remove/fit a measuring module

Every measuring module can easily be removed from the frame, e.g. for major service work or replacement. The module is mounted on the frame of the bench and is secured to the frame tubes by means of clamps. To remove a module, proceed as follows:

1 Open the front casing as described above. Release all connections from the front panel of the module.

2 Lower the casters of the profile measuring bench and pull the bench forward so that its rear will be accessible. Remove the upper cover plate at the rear. Start by backing off the lower screws of the plate about one turn. Then remove the upper screws and lift the plate away. Leave the lower screws in place.

3 Release the clamp that secures the module to the frame (usually two socket head screws that can be released from the underside).

4 Carefully lift the module out towards the rear.

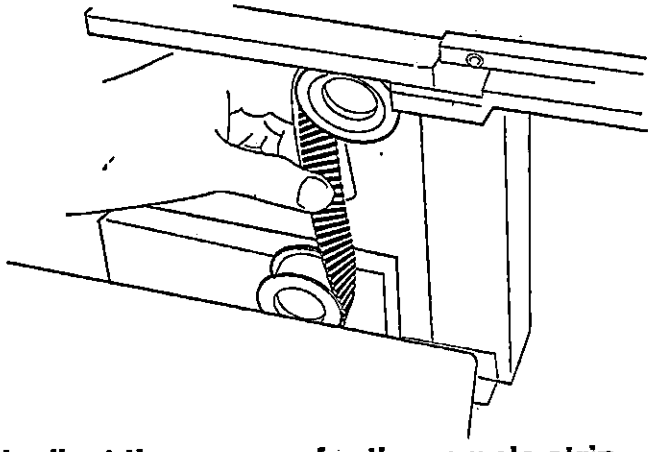
The modules with bursting strength testers can be withdrawn a few centimetres towards the rear, and the rear can then be lowered. Then slope the module towards the rear so that it can be lifted out between the square tubes of the frame.

5 Proceed in the reverse order to fit a module and re-assemble the profile measuring station.

6 If the profile measuring bench is to be used with one module removed, one of the blank plates supplied *must* be fitted in place of the module that has been removed.

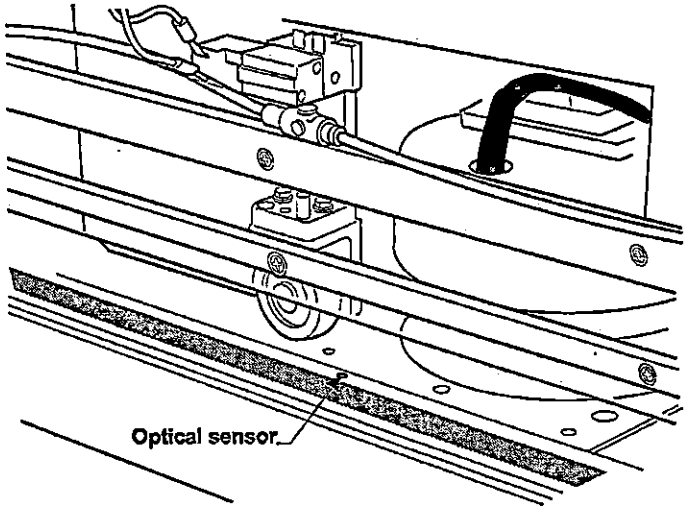
5.5 To check and adjust the drive belt tension

The drive belt tension need not normally be adjusted. The tensioner is mounted at the feed end of the bench, and access to it can be gained by pulling the front casing forward. Check the belt tension by twisting the belt between the tensioning pulley and the guide pulley as shown in the figure. Using normal force, it should be possible to twist the belt by hand through about 90°.

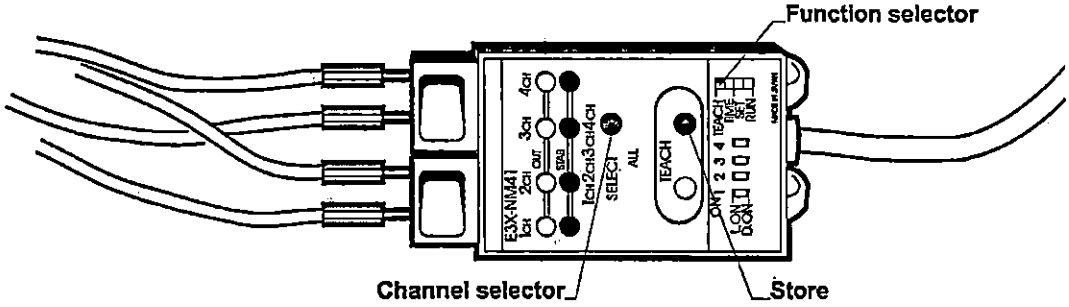


5.6 To clean and adjust the sensors for the sample strip

Four optical sensors sense the beginning and end of the sample strip. The sensors are mounted on the inside of the drive belt at every other drive roller. Blow the sensors clean every day. Use the cleaning air nozzle on the inside of the second door from the left.



An amplifier with which the sensitivity of the sensors can be adjusted is located behind the same door. To adjust, proceed as follows.



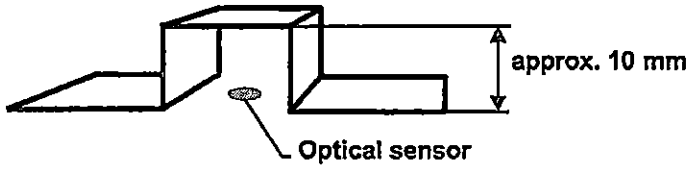
1 Clean the sensors and make sure that there is no paper or the like on them.

2 Remove the plastic cover from the amplifier control panel. Set the function selector to **TEACH.**

3 Select the first sensor (**1CH**) by pressing the channel selector button (**SELECT**) once.

4 Press the store button (**TEACH**) and keep it depressed until the diode next to the button lights up with a red light.

5 Bend a strip of paper or paperboard, about 15 mm wide, as shown in the drawing below and place it centrally over the first sensor at the extreme left.



6 Press the store button (**TEACH**) and keep it depressed until the diode lights up with a green light.

7 Change over to the next sensor (**2CH**) by pressing the channel selector button (**SELECT**) once. Repeat items 4 to 6 above on this sensor.

8 Repeat the same procedure on the third and fourth sensors.

9 Conclude by pressing the channel selector once, so that all sensors are active.

10 Reset the function selector to the **RUN** position and refit the cover.

5.7 Compressed air system

Draining the filter

Condensate is collected in the air filter bowls. When the condensate has risen to a certain level, the filters will be drained automatically. The filters can also be drained manually by opening a valve in the bottom of the bowl by turning the knurled knob. After draining, shut the valve by turning the knob in the opposite direction. The condensate level can be checked through a window on the guard for the filter bowls.

To check and replace the filter elements

The filter elements should be replaced if they have become clogged. Remove the filter bowls as follows.

1 Shut off the compressed air supply by turning the main valve to **AIR OFF.**

2 Remove the cover plate over the filters. First back off the lower screws about one turn and then remove the upper screws. Remove the cover plate.

3 Press the locking button on the filter bowl guard and keep it depressed.

4 Turn the guard about 45° anti-clockwise and remove it.

5 Press the filter bowl up, turn it through about 45° anti-clockwise and remove it. Clean the bowl, e.g. using soapy water, **but never use any solvent.**

6 **Coarse filter**

The filter element is mounted in a holder. Release the centre screw at the extreme bottom of the holder. Restrain the top part of the holder with one hand to prevent it from turning when the screw is being released. Fit a new filter element. If the entire insert holder has accidentally been removed, make sure that the small coil spring fitted between the element holder and the top part of the unit is in the right position when re-assembled.

7 **Fine filter**

Unscrew the filter element from the top part of the unit and fit a new element.

8 Refit the filter bowls and their guards, and refit the cover plate.