

HELPINSTILL PIANO SENSOR

Model 120
For Grand Pianos



Please Read Instructions Carefully
Before Using Your Helpinstill

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Model 120 For Grand Pianos

Your complete unit consists of the following pieces:

3 Sensors in lengths of 24", 16" and 14"

1 Gold Double Support Bar

2 Silver Underbars with adjustable pedestals

Control Box

Screwdriver for adjustment of pedestals

Owners Manual - Please read this first!



Installation

A Video showing the entire Installation is available on our website at www.helpinstill.com or on YouTube at <https://www.youtube.com/watch?v=bt9XpECy9pQ&t=45s>



The silver support bars are used to support two sensors under the middle and treble strings. The gold double support bar suspends the third sensor over the bass strings. Before installing any of the pickup strips, remove the tie wraps from the black cables and **smooth out, stretch and straighten the cables**. If they kink and curl under the strings, they may touch them and cause a buzzing noise.

The **longest pickup strip is always used under the highest notes**. Select which of the remaining two best fits the width of the bass section (usually the medium length) and attach it to the magnetic strip on the gold support bar. This bar then rests on the frame pieces on either side of the bass notes, and the double wingnut adjustment is used to hang the sensor strip about 1/4" over these strings. The gold bar has gray non-slip pads where it rests on the piano frame to eliminate rattles and minimize movement from vibration. This bar may be placed anywhere along strings, but the best sound will be achieved about 1/7 of the way from the end of the string at either end. The illustration shows the sensor at the far end from the keyboard, but it may also be placed at the other end near the area where the hammers strike the strings.

The copper-wound bass strings generate less signal in the pickups because copper is not magnetic, and only the steel core of these string produces output. Therefore, the limitation of the volume of the whole unit depends on adjusting the pickup hanging over the bass end until it is **as close to the strings as possible** without the strings buzzing on the pickup when played hard. This is usually about 1/8 inch of clearance. The other two pickups can be further away.

Next place the other two sensors on the silver underbars, the longest sensor on the longest bar. (They will stick on quite firmly because of their magnetic nature.) These support bars rest on pedestals that are padded to prevent scratching the soundboard, and to minimize vibration to the sensors. Make sure the screws of these pedestals are on either side of the sensors so that they will be adjustable from above. These two units are simply slid in under the strings from the left side of the piano, the longest first so it will end up under the highest notes. **If the clearance between the strings and the soundboard seems too close, and the tops of the pedestal screws hit the strings when sliding in, move them nearer the bridge (that's the end of the strings farthest from the keyboard.)** The screws will be the right height when the sensor is finally in place.



Sliding the High Sensor In

The position of the highest sensor is critical under the highest few notes. Try to align this sensor at a straightened angle that will keep its upper end as far away from the keys as possible to keep the top hammers from striking the sensor. The length of these highest strings allows just enough space for this clearance.

After the sensors are in place under the strings, stick the small screwdriver through the strings and turn the pedestal screw to adjust the clearance between the sensor and the strings to about 1/8" at the highest notes to about 1/4" in the middle of the piano. The sensors do not pick up any string movement over the last 1/4" on each end, so be careful to place the middle and highest pickups so that they overlap slightly to insure that the notes at their boundaries are properly picked up.

After placing the middle pickup in place under the strings, sometimes it helps to use the screwdriver to tuck the wire from the highest pickup under the middle bracket to insure that it won't curl up and touch the strings and cause buzzing noises.



When removing these units from the piano it is perfectly okay to use the wires to pull them out of the piano. These wires are very strongly attached inside the sensors and nearly impossible to pull loose.

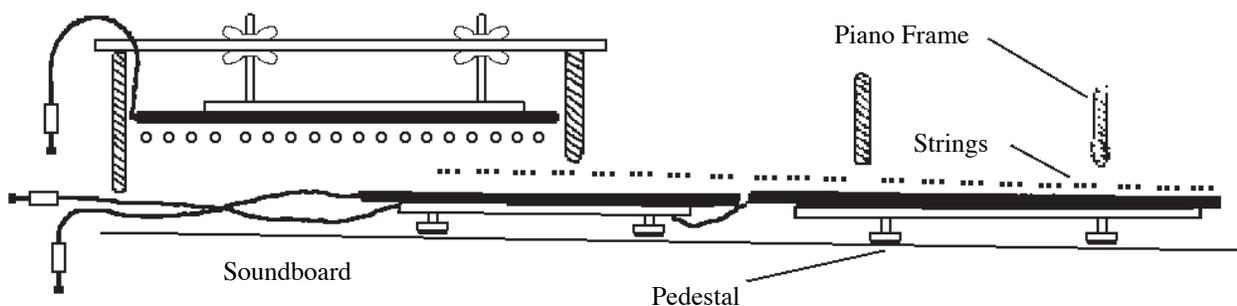
Adjustment & Hookup

After the sensors are in place in the piano, run the wires out the left side of the piano and plug each one into the corresponding input jack on the control box. Either or both of the outputs can then be connected to a sound system or amplifier.

For proper adjustment and balancing of the pickup levels, the signal needs to be routed to a monitor speaker or amp near the piano that is louder than the natural sound of the piano. The pickup can be used with the lid of the piano open or closed (it makes no difference to the pickup), but it is easier to tell the real volumes of the sensors with the lid shut.

Moving the middle pickup as close to the keyboard as possible will result in the best tone in that region; moving it further back will tend to emphasize the lower harmonics, resulting in more of an electric piano sound. There is a "sweet spot" about 2 inches beyond the dampers that is the best tone.

End View



Control Box



The control box is a passive unit. It does not require batteries, phantom power, or any other power source. This means it is compatible with sound systems worldwide, and requires no maintenance.

The three knobs on the control box control the volume of the three sensors. To start with, they should all be turned to their full-volume (12 o'clock) position. If any section of the piano sounds louder than the rest, it can be turned down in volume to balance. Invariably the lowest (bass) section is quieter than the rest, and its knob usually remains at 12 o'clock. **Never turn any of the volume controls all the way down, since that will cause the signal to be off for all three channels.** The best way to tell if a single sensor strip is working is to plug and unplug the sensor wire from the control box. When adjusting the volume controls, concentrate on smoothing the transition from one sensor region to the next.

If the piano signal seems to accentuate the notes at top end of the highest pickup too much, use the screwdriver pedestal adjustment to move that pickup further away from the strings on the high end rather than rolling off the high frequency equalization on the piano channel, since that would dull the tone of the whole piano. In general, the two pickups under the strings need to be about the same distance from the strings at either end of the pickup. If they are slanted in height, it will be impossible to adjust the volumes across the whole keyboard to be smooth and balanced.

Play test notes on the piano in the following order: first, play notes at near either end of each sensor; this will insure that the brackets are level. If they are not, use the screwdriver pedestal adjustments to balance. Then, play notes on either side of the junctions between sensors while using the control box volume knobs to smooth the transition between pickups. After this procedure is followed, the entire keyboard is now being reproduced at uniform volume.

In a permanent installation, such as a church or club, it is always a good idea to request that the

piano tuner not move the pickups around, since that will obviously change the installation. The position of the pickups is rarely in the tuner's way, yet they often have a tendency to move the pickup brackets out of the way and not move them back when they're finished.

Troubleshooting

As durable as the Helpinstill systems have proven to be over the years, any instrument can malfunction.

Sensors It is important that care is taken not to puncture the outer plastic casing of the sensors. The sensors are made to be flexible and durable, but contain hair-fine wires on the interior which could possibly be broken under extreme treatment.

If you suspect that a sensor is not working, measure it with an ohmmeter at the output plug on the end of the output wire. Each sensor should read between 300-500 ohms. There should be no fluctuation of this measurement with bending or tapping on the sensor. If this measurement is consistent, the sensor will definitely work properly in the system.

Buzzing Noises Aside from mechanical buzzing of the strings against the pickup or wires, buzzing noise or hum of an electrical nature has two primary causes: ground problems between the unit and the mic line it's plugged into, and electromagnetic interference in the vicinity of the piano. It has been found that most hum or grounding noise originates in the system that the pickup is plugged into. If any noise is encountered when the pickup channel is turned on, the following procedures can be used to isolate the cause:

1. **Ground Loops** The Helpinstill system is completely passive and requires no power source itself. If ground-loop buzzing is encountered, try unplugging the mic cable from the control box and plugging it into an ordinary dynamic microphone, such as an SM-58. The continued presence of the hum in the system would, of course, rule out the piano pickup as its source. If hum is only when the piano pickup is connected, try patching the hi-Z output of the piano pickup into a direct box with a ground lift, and plugging the mic cable into the direct box. Lifting the ground at the direct box may then eliminate the hum.

2. **Airborne Hum Pickup** There is a chance that RF or other electromagnetic waves in the vicinity of the piano may be picked up by the sensors. To test for this possibility, unplug all three wires from the sensors into the control box. If this action kills the hum, then it is actually being picked up by the sensors. Sources for this hum may include powered devices near the piano, such as keyboards, music lights, etc., or remote sources such as power distribution systems or lighting.

The sensors work the same on both sides, so often the noise can be minimized by flipping over one of the sensors under the strings, which will create a hum-cancelling effect. The sensor over the bass strings cannot be flipped over, since it only attaches to the gold bar one way, but that still leaves four different orientations of the other two. The best procedure is to temporarily remove the two pickups from underneath the strings, plug them back into the control box and lay them on top of the frame over their eventual positions. Then try flipping them over one at a time until all four combinations have been tried, while listening to the hum in the system. Once the optimum orientation is found, mark the top sides of the sensors with a pencil, and replace them under the strings in the same pattern.

If elimination of the hum is found not to be satisfactory, the ultimate solution would be to upgrade your system to the Model 180 Humbucking Grand Piano Sensor. We make this option available for the difference in price between the two systems, and is a simple procedure guaranteed to work.

Warranty

When you own a Helpinstill, you're a member of the family. We want your unit to work forever, and we'll do whatever it takes to keep you satisfied. Call us anytime at (713) 432-1089 with questions or suggestions, or e-mail us at pianopickup@aol.com, or visit our website at

www.helpinstill.com



"There's No Substitute for Real Piano"