

Step 1: Planning the project



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Completed gutter

Evaluate and plan the project

Professionally installed continuous gutters using strip miters or the box style corners, remember to add 5" for each outside corner when using strip miter corner connections (6" for 6" gutters). Inspect the fascia and Soffit for signs of rotted wood, we recommend replacing before the installation of new gutters. Many houses have a trim board or crown molding nailed to the fascia just under the shingles. You'll have to either remove this as we did or add a continuous strip of wood under it to create a flat plane for the gutters the other popular option is to install gutter wedges.

Draw a sketch and measure your house

Fig. A shows an example of a gutter system for a typical house. Record the length of the gutter runs and mark the downspout locations. You are now ready to manufacture your custom gutter lengths (you will need to add 5" for each outside corner if you are installing strip miters for your corner connections). Measure the height of downspouts and add 4 ft. to each for the extension away from the house at the bottom. Each downspout requires three elbows. There are two types of elbows (A for straights and B for side elbows) that turn either to the front or side of the downspout. Most installations require only front elbows, but occasionally you may need a side elbow, usually to turn the downspout extension sideways. Here are a few planning tips:

- Locate downspouts in unobstructed areas where water can be directed away from the house. Avoid locations with obstacles like electric meters, hose bibs or sidewalks.
- Place downspouts in inconspicuous locations if possible.
- Install oversized 3 x 4-in. downspouts on gutters that drain large roof areas or if you live in an area with torrential rains.

- Slope long gutter runs (50 ft. or more) down both directions from the middle and put a downspout on each end.
- Buy special roof hanger mounting straps for houses without fascia boards or for fascia's that aren't vertical. Vampire hanger by Petit or O.G. Hangers. (Strap Hanger)

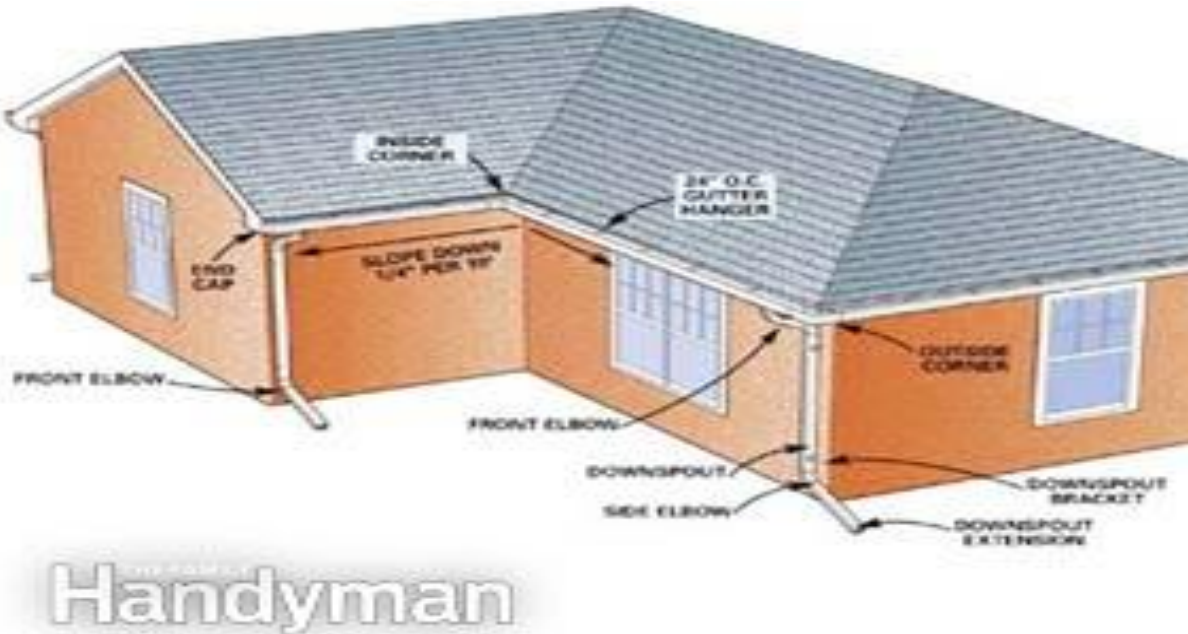


Figure A: Gutter parts

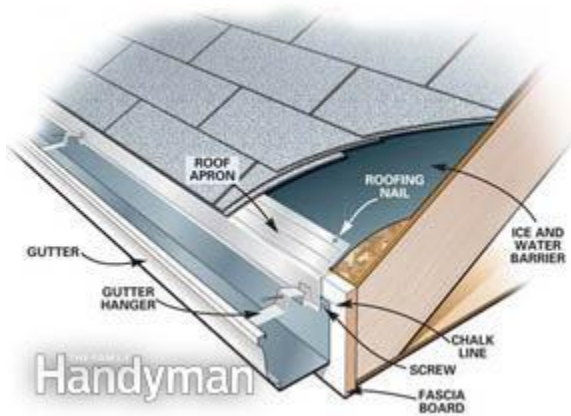


Figure B: Mounting details

Step 2: Making your Gutter

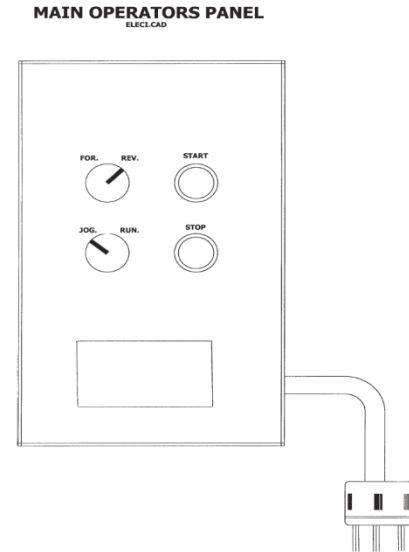
Photo 1: Run the Gutter to the Desired Length

1E. MAIN OPERATOR'S PANEL

The MAIN OPERATOR'S PANEL is located on the right side at the exit end of the machine.

THE MAIN OPERATOR'S PANEL CONSISTS OF:

- 2 SELECTOR SWITCHES
 - JOG-RUN
 - FORWARD-REVERSE
- 2 PUSH BUTTONS
 - START (GREEN)
 - STOP (RED)
- DUPLEX RECEPTACLE
 - ACCESSORY POWER SUPPLY

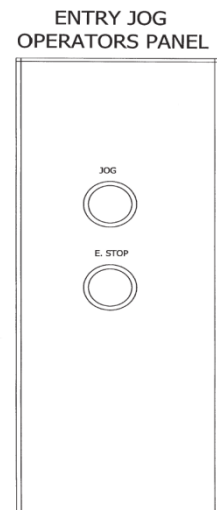


2E. ENTRY OPERATOR'S PANEL

The ENTRY OPERATOR'S PANEL is located on the right side at the entrance end of the machine.

THE ENTRY OPERATOR'S PANEL CONSISTS OF:

- 1 PUSH BUTTON
 - JOG (GREEN)
- POWER SHUT OFF
 - EMERGENCY STOP BUTTON (RED)



3E. POWER SOURCE PLUG

The POWER SOURCE PLUG is located at the exit end of the machine on the right side.

FEEDING THE MACHINE:

1. Position selector switch to the JOG position.
2. Position selector switch to the FORWARD position.
3. Remove pressure on spool brakes. (SEE PG. 10)
4. Trim both corners of the coil material, removing two 3" X 3" triangles. (SEE PG. 12)
5. Standing at entrance of machine, position material through the entrance guides to the #1 drive assembly.
6. Activate the JOG button using your right hand-at the same time- using your left hand to push material so as to engage with #1 drive assembly. Jog the material approximately two feet.
7. Using the main control panel jog material through guillotine using START-push button.
8. Position selector switch to the RUN position.

Preassemble gutters

it's much easier to install the end-caps, drop outlets and miters on the ground than to work from the top of a ladder. Where a gutter ends, cut it to extend about an inch past the end of the fascia board to catch water from the overhanging shingles. Then attach an end cap and seal the joint from the inside with gutter sealant.

Step 3: Adding downspouts and outlets



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Photo 6: Mark the downspout outlet

Mark the center of the downspout outlet on the bottom of the gutter. Center the outlet, flange side down, over the mark and trace around the inside. Cut a V-shaped notch with an old chisel as a starting hole for the tin snips. Place two short scraps of 2x4 side by side under the gutter to support it while you chisel the notch.

Cut in downspout tubes at each downspout location

First measure from the corner of the house to the center of your chosen downspout location. Double-check for obstructions. Transfer this dimension to the gutter and cut in a downspout outlet. You can make this cutout with a duckbill tin snips, but a special offset snips like we're using (available from hardware stores and home centers) is much easier for beginners. Malco also offers a drop outlet cutting tool. (Outlet Punch)

Step 4: Hanging gutter sections



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Photo 9: Mark the gutter slope

Set the proper slope by driving a nail at the desired position of the bottom of the gutter, high side of the gutter run. Measure and record the distance from the bottom of the fascia board to this nail. Subtract $\frac{1}{32}$ in. for every 10 ft. of gutter from this measurement and mark this distance at the low end of the gutter run. Drive a nail at this mark and stretch a chalk line between the two nails. Align a level with the string to check the slope. The bubble should be off-center toward the high side. If it's not, adjust the string until the bubble indicates that you have the proper slope. Finally, snap the string to mark a line on the fascia board.

A little slope is all you need

The number and size of downspouts determines how fast your gutters will empty. Sloping them helps eliminate standing water that can cause corrosion and leak through the seams. Slope each gutter run down toward the downspout about $\frac{1}{32}$ in. for every 10 ft. of gutter. If your fascia boards are level, you can use them as a reference for sloping the gutters. Check this by holding a level against the bottom edge. If they aren't level, adjust the string line until a level aligned with it shows a slight slope (Photo 9). Snap a chalk line to indicate the top of the gutter. Then straighten gutter sections as you screw them to the fascia by aligning the top edge with the chalk line.

Step 5: Finish with flashing and hangers



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Photo 11: Add gutter flashing

Slide gutter flashing under the shingles and secure with 1-in. roofing nails every 2 ft. Lap sections about 2 in.

Flashing protects your fascia and soffit from water damage

Prevent water from running behind your gutters by installing a metal gutter apron flashing under the shingles and over the back edge of the gutter (Photo 11). If your supplier doesn't sell prebent flashing, it can be bent on a sheet metal brake. Ideally the flashing should be slid under both the shingles and the roofing paper and over the ice and water barrier. If this isn't possible because there are too many nails and staples along the edge of the roofing paper, then just slip the flashing under the shingles (Photo 11). If the flashing you're using is too short to reach down over the back edge of the gutter, slip an additional strip of sheet metal flashing under the bent flashing and over the gutters.

Install hidden hangers

With the gutters screwed to the fascia, it's a simple job to install the hidden gutter hangers (Photo 12). Install hangers every 2 ft. to support the gutters and strengthen the front edge. The clip hanger is designed to slip over the back edge of the gutter when gutter flashing will not be used, but since we've installed gutter flashing, just hold them level and drive the screws through the flashing and gutter back into the fascia.

Step 6: Installing the downspouts



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Photo 13: Attach elbows to the downspout

Screw an elbow to the downspout outlet. Hold another elbow against the wall and measure between them. Allow for a 1-1/2 in. overlap at each end. Use a hacksaw to cut this length from the uncrimped end of a downspout tube.

A special crimper tool eliminates downspout frustration

We're using standard 2 x 3-in. downspouts, but the procedure for oversized 3 x 4-in. ones is the same. Assemble the elbows and downspout tube with the crimped ends facing down to prevent water from leaking out of the joints. Use sheet metal screws rather than rivets so you can disassemble the downspouts to clean them if necessary. Pros prefer prepainted 1/4-in. hex head screws with very sharp points, called "zipper" because they're easy to install. We found these screws in the aluminum siding section of a home center, but a gutter supplier would be another good source.

You can cut downspout tubing with a 32-tooth hacksaw blade, but the pro we talked to uses a circular saw with a standard 24-tooth carbide blade. A power miter box also works great for cutting both gutters and downspouts. Use an old blade, though. Protect yourself from flying bits of metal with goggles, leather gloves, jeans and a long-sleeve shirt.

Each length of gutter and every elbow is squeezed, or crimped, on one end to allow the pieces to fit together, one inside the other. Since 10-ft. lengths of downspout are only crimped on one end, you'll have to crimp one end of any cutoff piece to make it fit inside the next elbow or downspout section. Finish the gutter job by installing the downspouts, pipe straps or cleats are the best method for attaching the downspouts to the wall.