



BUILDING THE FUTURE

Your reference:

Our reference:

Customer No.:

Reference No.:

Date:

Revision:

BEG 97 - Autofloor

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Production line

1. Jig table. This table has pins, the pins go up/down separately. Means that you can just move them sideways on the table, then take the pin up and clamp. Movement/adjustment of pins is automatic according to the CAD information.
2. Computerized bridge with gluing, nailing, milling, cutting, board handling and inkjet.
3. Jig table same as 1.
4. Automatic handling and placement of boards.
5. Transfer
6. Roller conveyor
7. Roller conveyor
8. Transfer

System Description - AutoFloor System

The system is designed to produce floor/ceiling/roof elements efficiently and with a very high automation level. The main idea is to have two jig systems and when the operators are working and building the framework in one of the two jigs the automatic bridge processes the framework on the other jig system.

The system can produce up to 12 m long floor elements (please refer to diagram to reference stations below)

Position 1 and 3: In these 2 positions the work with building up the framework for the floor element starts. The easily accessible jig station is open making it possible to walk into the station which is effective and ergonomic for the operators. The system consists of several jigs that travel on rails on the ground. Each jig has seven pin wagons that automatically sets-up according to CAD-file and will act as support when building the framework beam by beam. Each pin wagon has 2 pins which are activated by a simple button push by the operator. The first pin will be raised then the beam will be placed next to the pin, next push will activate and raise the pin next to the first. Then final button push will clamp the beam between the pins. The main advantage you get from this jig solution is that you get an efficient support automatically when the pin wagons are placed along the jig. In this system you can build any shape of floor element you are not limited by the shape of the jig, regardless of if you have stair openings etc or if the elements are non-square it will build up the support for you. When the operators have built the framework in i.e. position 1 they simply go to position 3 and the automatic bridge will do the opposite.

Position 4: Sheet handler, this is an automatic system for feeding of sheets to the floor element. The only manual process is to place the full sheet packages on position A, B or C. Three different sheet types with 3 different heights are placed by forklift on the roller conveyors then the system will take care of the rest automatically. When the bridge is processing the floor element in position 1 or 3 the sheet handler is preparing the next job by picking the required sheets for the next job. The system picks using a vacuum picker from position H, E or D, counts the right quantity and squares each sheet making the pile uniform. Then the ready pile will be built up at G or F, G will serve position 1 and F will serve position 3. When the automatic bridge has processed i.e. position 1 it will travel towards position 3 on the way it will stop next to the sheet handler and fill up sheets, the entire pile will be rolled over as it is squared and consists of the correct quantity of sheets for the next job. The bridge will travel to position 1 loaded with the pile of sheets.

Position 2: Automatic bridge: The bridge travels between position 1 and 3 and when passing the sheet handler, it stops and fills up sheets for the coming floor element to be processed. The bridge will start by adding glue to the framework automatically from 5 glue nozzles. Then it will continue to place the

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sheets on the framework and before it nails/screws them it will push the tongue and groove connections together using a clamping system. Each sheet is placed clamped and nailed. The next process is to do the cut out for openings such as stair openings or chimney openings or to saw overhanging sheets.

Then it will mill smaller holes or square openings for plumbing etc. Finally, it will mark the floor element with desired production data or other data, i.e. lines for placement of internal walls that can strongly simplify the erection process at building site.

Dimensions of floor cassettes.

Max. length:	12192 mm,	40.0'
Min. length:	2 000 mm	6.6'
Max. width:	3680 mm,	12.1'
Min. width:	600 mm	2.0'
Max. thickness:	400 or 600 mm*	15.75'
Min. thickness:	150 or 350 mm*	6"
Max. weight:	2000 kg	4409 lb

*Optional, either 150-400 or 350-600-mm. To be determined before signing.

1 Jig-table

The station consists of four (5) individual jig stands. Each jig stand has one chain conveyer for transport of the panel to next station. One beam makes the base for the joist when framing and installation of sub-floor. Each jig stand can be individually moved, manually, sideways in the floor panel length direction.

Each jig stand has seven (7) jig trolleys. Each trolley has two (2) pins, one fixed and one movable sideways. The jig trolleys are used to fix the on-center distance for the joists. The jig trolleys are controlled by servomotor and get its information from the CAD file.

The pins on the jig trolley is adjustable for different joist heights, this is controlled by electric motor and based on the CAD instructions. The individual pins can be moved up or down manually, this motion is controlled by pneumatic cylinder. Individual movement of the pins is to make it easier when installing the joists. One pin on each trolley is movable sideways to clamp the joist in place. The side movement is made by pneumatic cylinder and is manually controlled.

One screen for operator.



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Art. No.	Description	Qty.
N/A	Jig-table	1

2 Working bridge

Technical:

The bridge travels on rails attached to the factory floor. All electric supply to the bridge is from overhead cable track. The bridge has one roller conveyor for storing sub-floor sheathing. The vacuum lifter on the bridge picks individual sheaths from the conveyor and places them on to the floor frame. Instructions for placing the sheaths are based on CAD instructions. The bridge incorporates the tooling necessary to engage tongue and groove and a sheet pusher.

The bridge has five (5) tool trolleys on one side of the bridge. On each trolley are mounted one (1) ballistic screw tool. One (1) glue sprayer (Graco). Every tool trolley is controlled by a separate servomotor that receives its information from the CAD instructions. The heights adjustments of the tools are made by electrical motor with instructions from the CAD.

A separate tool trolley, mounted on the opposite side of the bridge is used to apply glue (Graco unit) across the floor panel. This trolley also has one ink-jet marker, one router and one cutting saw, revolving 90 degrees, for boards. The height control of all tools mounted on this trolley is made by instructions from the CAD.

The bridge has a platform where the operator can stand during operation. The entire bridge is automatic, but the operator can stop the bridge if any manual adjustment is required.

Screen for operator placed on the Bridge.

A platform/ stand for mounting the glue barrel will be installed. The bridge will also have a self-contained vacuum system mounted.

Ballistic screw tools, saw, milling, and gluing equipment is included in delivery. Functional.

Gluing equipment is configured for Polyurethan adhesive.

Typ: One-component.

Viscosity: 150 000 cps.

Application temperature: 32F – 120F.

Note! Varying Ambient temperature and size of glue bead will affect the bridge cycle time and overall capacity.

The package with boards for actual panel is transported onto the bridge. This will happen when bridge is in idle position. Operator gives start signal and the bridges starts gluing the joists. Boards are then automatically placed and tacked with a few nails/screws. If it is needed any manual placement of boards

can be done before or after the automatically placement is done. The bridge nails/screws the boards to the joist. Inkjet marks the boards according to the information in the CAD-file. Cutting out holes and trimming of the boards are done either with the cutting saw or with the router. Panel is now finished.



Art. No.	Description	Qty.
N/A	Working bridge	1
N/A	Holder for nailing tool + nailing tool	5
N/A	Interpolated router unit	1
N/A	Saw unit	1
N/A	Inkjet	1
N/A	Holder for glue nozzle + nozzles	5

3 Jig Table

The station consists of four (5) individual jig stands. Each jig stand has one chain conveyor for transport of the panel to next station. One beam makes the base for the joist when framing and installation of sub-floor. Each jig stand can be individually moved, manually, sideways in the floor panel length direction.

Each jig stand has seven (7) jig trolleys. Each trolley has two (2) pins, one fixed and one movable sideways. The jig trolleys are used to fix the on-center distance for the joists. The jig trolleys are controlled by servomotor and get its information from the CAD file.

The pins on the jig trolley is adjustable for different joist heights, this is controlled by electric motor and based on the CAD instructions. The individual pins can be moved up or down manually, this motion is controlled by pneumatic cylinder. Individual movement of the pins is to make it easier when installing the

joists. One pin on each trolley is movable sideways to clamp the joist in place. The side movement is made by pneumatic cylinder and is manually controlled.

One screen for operator.

Art. No.	Description	Qty.
N/A	Jig tables	1

4 Automatic feeding and handling of boards

Technical

The station consists of three roller tables for the material in feed and three roller tables for storing sheets of different dimensions. One squaring table where the sheet is clamped to a fixed position. Two roller tables that stores the positioned sheet package for jig station 1 and

3. packed. One wagon with vacuum picker.

Functional

The station is automatic and receives the instruction for what size sheathing to pick from the CAD. Vacuum lifter picks up the sheaths from the sheathing storage. The sheaths are individually placed on a squaring table. Each sheath is squared up on the table. After the sheaths are squared the pile is then moved over to one of the transfer roller conveyors. When all the sheaths for one floor panel in the jig station are loaded on to the transfer conveyor, the entire pile of sheathing is moved over to the bridge (Station # 2).



Art. No.	Description	Qty.
N/A	Automatic feeding of boards	1

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5 Transfer station

Technical

Each station consists of four (4) 1" chain conveyors for moving the floor panel sideways from the framing jig. The chain conveyors are movable up and down. The station has one roller conveyor 6 m long, each roller has a length of 3,5 m and are placed 900 mm centre, for transferring the panel over to next station. The station moves sideways to line up with next stations.

Functional

When the panel is finished in jig station, operator starts the transportation cycle. Transfer station moves sideways towards the jig station and stops. The panel is transported from the jig to the transfer station and then transfer station moves back again to its home position and the panel can then be transported to next roller conveyor.

Art. No.	Description	Qty.
N/A	Transfer station	1

6 Roller Conveyor

Roller conveyor 12 m long, each roller has a length of 3,5 m and are placed 900 mm centre.

Art. No.	Description	Qty.
N/A	Roller conveyor	1

7 Roller Conveyor

Roller conveyor 12 m long, each roller has a length of 3,5 m and are placed 900 mm centre.

Art. No.	Description	Qty.
N/A	Roller conveyor	1

8 Transfer station

Technical

Each station consists of four (4) 1" chain conveyors for moving the floor panel sideways from the framing jig. The chain conveyors are movable up and down. The station has one roller conveyor 6 m long, each roller has a length of 3,5 m and are placed 900 mm centre, for transferring the panel over to next station. The station moves sideways to line up with next stations.

Functional

When the panel is finished in jig station, operator starts the transportation cycle. Transfer station moves sideways towards the jig station and stops. The panel is transported from the jig to the transfer station and then transfer station moves back again to its home position and the panel can then be transported to next roller conveyor.

Art. No.	Description	Qty.
N/A	Transfer station	1

9 IIoT platform

Randek's go-to platform for Industrial IoT connecting people and machines via cloud services with the end purpose to create new customer values, data-driven decisions and optimizing business models.

The platform and its connected hardware offer possibilities to gather data and user-friendly tools to analyse, monitor and create reports. It enables data analysis from a supplier point of view to optimize the machine availability for the user.



Basic installation includes:

- Data collection from each machine generating data in the machine line.
- Possibilities to analyse separate work shifts and data associated with them.
- Breakdown of data to each individual building element in a project.
- Data collection for alarms and an overview of the 10 most common ones over a set time.
- Data collection of waiting time for each machine up- and downstream.
- Measurement of current cycle time and a comparison to historic cycle time.
- One data package is included, covering 100 data tags per second.

Art. No.	Description	Qty.
N/A	IIoT Platform	1

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Pos. / Art.nr	Machine/ Description	Price summary
1	Jig table	1
2	Working bridge	1
2.1	Holder for nailing tool + nailing tool	5
2.2	Interpolated router unit	1
2.3	Saw unit	1
2.4	Inkjet	1
2.5	Holder for glue nozzles + nozzles	5
3	Jig tables	1
4	Automatic feeding and handling of boards	1
5	Transfer station	1
6	Roller conveyor	1
7	Roller conveyor	1
8	Transfer station	1
9	IIoT Platform	1
Installation		
Support after SAT		
Shipping		
All prices are presented without VAT, local taxes and other fees. Additional packing costs will be added.		