

Automated conveyor systems



**TECHNICAL SOLUTIONS FOR VARIOUS INDUSTRIES AND WAREHOUSES**



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The production and technical company NORMATIV was founded in 1988 in Saint-Petersburg, Russia and supplies solutions and services for **more than 25 years**.

The main focus of the activity of the company:

**automation of production process on the basis of conveyor systems.**

### Company's activities

- Automated Modular production and assembly lines
- Warehousing
- Hoists. Vertical conveyors
- Non-standard equipment
- Conveyor equipment
- Industrial furnishing

We develop the general structural technological plans according to production premise and power supply systems, conduct field supervision during manufacturing; we can also arrange delivery of equipment to any region. We perform installation and commissioning, as well as the staff training.

Our company supplies solutions on a turnkey basis, which means that we can offer you complex designs: automated conveyor systems implementing the complete cycle, step by step:

- analysis and consulting
- engineering and design
- modelling
- development of equipment for production lines
- equipment manufacturing
- software
- testing
- installation and commissioning
- support during commissioning and running

All equipment is warranted for 12 months.

### Our customers

The Company has performed a whole range of works on design, manufacturing, installation, software and commissioning of conveyor systems for different purposes for various industries:



*(Completed projects can be found on the company's website: [www.normativ.spb.ru/projects](http://www.normativ.spb.ru/projects))*



## Conveyor equipment



**Belt conveyors**



**Modular conveyors**



**Roller conveyors**



**Plate chain conveyors**



**Conveyors chain and belt**



**Vertical conveyors. Hoists**



**Special conveyors**



**Rotary and accumulation tables**



**Conveyors with gimbal chain**



**Additional items and equipment**



## Industrial furniture

### Ergonomic assembly tables and production lines on base of aluminum extrusions



#### Workbench

Ability to add extra items (up to complete set of the table "Standard").



#### Trolley

To move components and products.

4



#### Table 1.2 Standard

Aluminum frame construction allows you to equip your workplace with all sorts of options: hanging boxes, brackets for monitors, or laptop computer.



#### Mobile shelves

For storage of accessories and optional equipment. Shelves of different sizes are adjustable in height. Additional option: placing an electrical panel.



#### Table Standard 1

Easily integrated into the production line. All kinds of modifications.

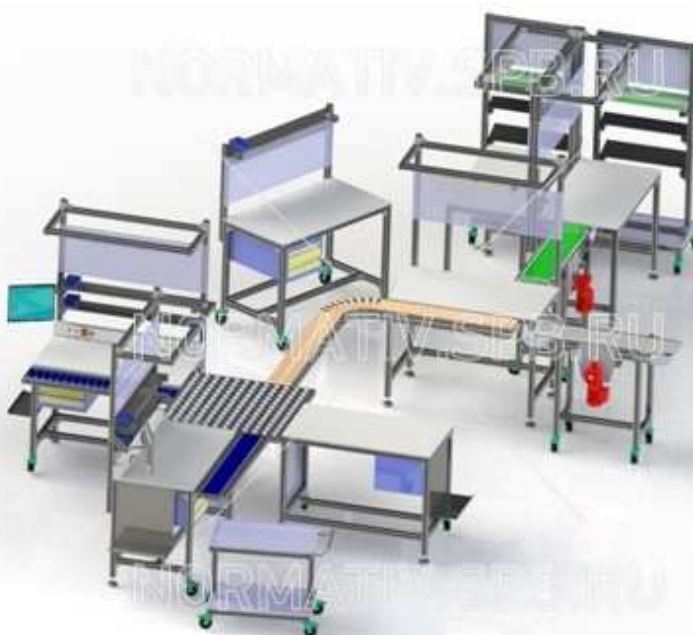


#### Mobile table

Additional workstation in a separate position or mounted in a line. Also suitable for working with large-sized products.

Our company manufactures both standard models and custom-made ones, tailored for specific production: The construction of the aluminium table has its individual design in accordance with the requirements of the customer and may be introduced to the assembly line.

## Modular assembly lines



The line consist of modules can be easily reconfigured. This will allow you by your own:

- change the saturation of the tables under the new task
- model a new configuration of a line
- extend the capabilities of the line, using additional equipment and aluminum profile
- To organize a new assembly process within a working shift.

**Combining modules allows you to compose a line of any desired length and complexity.**

Technical solutions for various industries and warehouses

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### Automated production assembly lines allows to:

- mechanize and automate the assembly process
- reconfigure assembly line in accordance with the various systems management software
- increase the productivity of workers, improve their working conditions
- reduce the number of work-pickers
- improve the quality of products
- reduce the area of the plant for assembly
- reduce production costs

The line can be equipped with a PLC (programmable logic controller) for complete automation: step by step controlled process of assembly and installation.





### Multilevel Carousel conveyor continuous lifting and lowering of goods



Multipurpose conveyor system allows to organize continuous ascent, descent of the goods immediately on several floors/ levels, carrying an automatic loading and unloading boxes (other packagings) at any chosen level.

Constructively the conveyor frame consist of modules made of aluminum extrusions, which provides:

- ease of installation
- adjustment to any level heights
- Any high-altitude performance of up to 15 meters
- ease of location of loading and unloading places on each floor
- the ability to connect to existing conveyor lines, easy installation of new systems

- work as a clockwise and reverse

The conveyor is suitable for transporting:

- boxes and crates
- packagings and packages
- other transport units dimensions (Length x Width x Height (mm): 600x400x400) weighing up to 30 kg

### Specification

Dimensions	Height (mm)	Quantity (pcs)
The upper drive section	1200	1
Standard intermediate section (*possibility of customizing)	2000	1-6
Lower tension section	1500	1
The total value (* in case of the standard value of the intermediate section)	Min = 4700 Max = 14700	Min = 3 Max = 8
Dimensions of the frame structure (in cross section)	Length (mm)	Width (mm)
	1400	1100
<b>Productivity</b> , pcs./hour (with the possibility of simultaneous loading / unloading on each floor)		Max = 900
<b>Power consumption</b> , kW/h (depends on configuration)		from 0,5

### Loaded product characteristics

Load on 1 platform	Weight, kg	Dimension area (mm)
Standart	30	Max = 500 x 600
Special addition	60	Max = 500 x 600



### Multilevel reverse lift with automatic loading/unloading of goods on pallets

- The lift provides automatic feeding (ascent/ descent) of cargo on the pallets on any chosen floor.
- Installation of cargo on a preliminary conveyor allows the operator do not wait for the download on the lift.
- Operator by selecting the desired floor by pressing a button, regulates the preparing of the mobile platform and the consistency of the automatic loading of pallets, using the attached reversible conveyor.
- After lifting to the predetermined level, at the same time runs two conveyors: stationary on this floor and the conveyor mounted on the platform of a lift.
- The possibility of intermediate stops at any point along the entire height of the mine hoist is easy given by the choice of sensors location.
- The lift is designed for transporting pallets sizes up to (Length x Width (mm)) 1200x800 , weighing up to 1000 кг

7

### Specification

Dimensions	Height (mm)	Quantity (pcs)
The upper drive section	1100	1
Standard intermediate section (*possibility of customizing)	from 2000	1-__
Lower tension section	1250	1
The total value (* in case of the standard value of the intermediate section)	Min = 4350	Min = 3
Dimensions of the frame structure (in cross section)	Length (mm)	Width (mm)
	900	300
<b>Productivity</b> , pallets/hour		Max = 60
<b>Power consumption</b> , kW/h (depends on configuration)		from 5,5

### Loaded product characteristics

Load on 1 platform	Weight, kg	Dimension area (mm)
Standart	Max = 1000	Max = 1200 x 800

## Vertical conveyor for pallets



Automated work: the pallet is loaded onto the platform's roller conveyor and stops, then the platform produces vertical movement and roller conveyor unloads the pallet.

It provides continuous descent pallets on the ground floor and delivers them to the packing line. In case of full loading of the line a pallet automatically moves to the buffer zone, from there the automatic operation mode selects the pallets on the packing line, in the case of it's ready acceptance.

8

## Vertical conveyor C-shaped



Designed for continuous transfer of goods (boxes, cases, bags and other piece goods) vertically from top to bottom or bottom to top. C-shaped scheme assumes that the entrance to the mine and the exit from it on one hand of a conveyor.

- Alternative to industrial lift
- Hight - adjustable value

## Vertical conveyor S-shaped



Designed for continuous transfer of goods (boxes, cases, bags and other piece goods) vertically from top to bottom or bottom to top. The S-shaped scheme assumes that the entrance to the mine of a conveyor from one side, exit on the opposite (the pallet moves straight through the mine)

The hight and productivity is developed individually for the requirements of the customer.

- Alternative to industrial lift
- Hight - adjustable value



## Transfer to large-size substrates and pallets



9

## Rotary table



## Tilter





## Rotary table with a roller conveyor



## Logistics line for pallets with large rolls of plastic film



## 1. Conveyor system with automatic control system for the transporting of goods in the six-story warehouse

### Task

To transport the certain box with specific content from one of the upper floors of a warehouse to a certain delivery window on the first floor.

### Job description conveyor system

On the ground floor is installed the main control panel, it displays conveyors that are operating at the moment.

Intermediate inclined conveyors are equipped with sound and light indication. An operator standing on the ground floor selects the conveyors for inclusion in the work. Before the chosen conveyor runs, triggers a beep and lights up the lighthouse at an appropriate floor.

On every floor there is an emergency stop button for each certain interstorey conveyor. All conveyors are equipped with sensors jam (congestion): if for some reason, the box does not go out of his line of sight, the conveyor stops automatically.

There is a separation of the boxes on the ground floor, to create between them the required distance: the conveyor stops for the set time, holding the boxes. Then every box passes the bar code scanner, the reader information is fed to the data processing module that determines on which of the discharge stations the box should come and outputs a specific signal to the control panel of the conveyor system. The controller, after receiving a signal from the system distribution and accounting, activates particular transfer, preventing further movement of the box, and it is transmitted to the defined discharge post.

The desired box was passed, the rest continue to move freely to their transfers and discharge stations.

If there is no signal to the transfer (unreadable or missing barcode), the box goes to the buffer zone. On the line installed light indication to signal the presence of an unidentified box.

### Specification

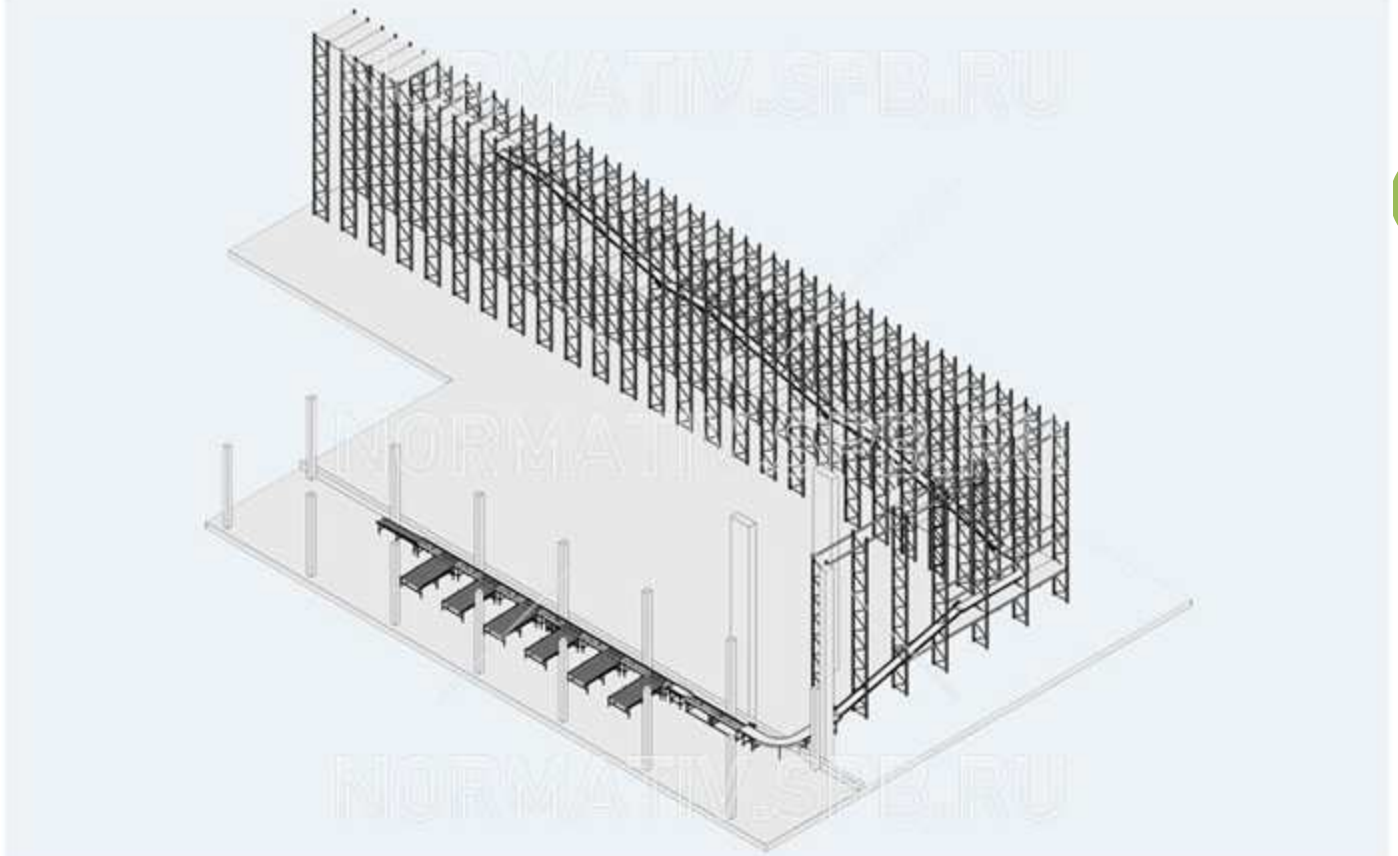
Power consumption, kW / h	≤15
Compressed air consumption, NI / min	≤400
Operating pressure, bar	8
Operating ambient temperature, °C	+10 → +40
Supply voltage, V	380
Frequency, Hz	50
Nominal number of positives pneumatic, 1/ min	60
Protection class of electrical equipment, IP	54
Protection class Air Compressor, IP	20

### Loaded product characteristics

Type	Carton box
Dimension area (LxWxH), mm	600 x 400 x 400
Weight, kg	50
Orientation of product input and output	short-edge first



**Illustrations**



Pic. 1. Six-story conveyor model



Pic. 2. Ground floor. The box moves to the unloading roller conveyor



Pic. 3. Ground floor, unloading posts

## 2. The automated spiral conveyor system for lifting and lowering plastic boxes in the 4-level warehouse

### Job description conveyor system

Spiral conveyor system with rotary conveyor consists of two streams: one for the descent of the goods, the other to replenish floors with the empty containers. The conveyors mounted on similarity of an oval spirals arranged one above the other, with a distance sufficient for passage of containers. The conveyors mounted on similarity of an oval spirals arranged one above the other, with a distance sufficient for the passage of containers.

System has an adjustable speed. It combines two tasks: the descent of full boxes from all the floors to 0 level and deliver empty boxes to the levels from where the product was descent. Available modes: simultaneous automatic work on the descent and replenishment and separately (only for the descent or replenishment).

At each level of both streams there are installed rotary modular conveyors to let the flow move from one to another inclined conveyor. To submit an empty box on the floor a pneumatic pusher is used

In the work area on each level offered elongated components for styling product or selection of empty boxes.

APCS provides tracking the passage of the containers by built-in sensors, is equipped with a programmable controller.

The **additional equipment** includes:

The control system with a controller, the emergency button on each floor, storage and providing conveyors, the sensors to control the overflow and defining the presence of the box for the descent

### Specification

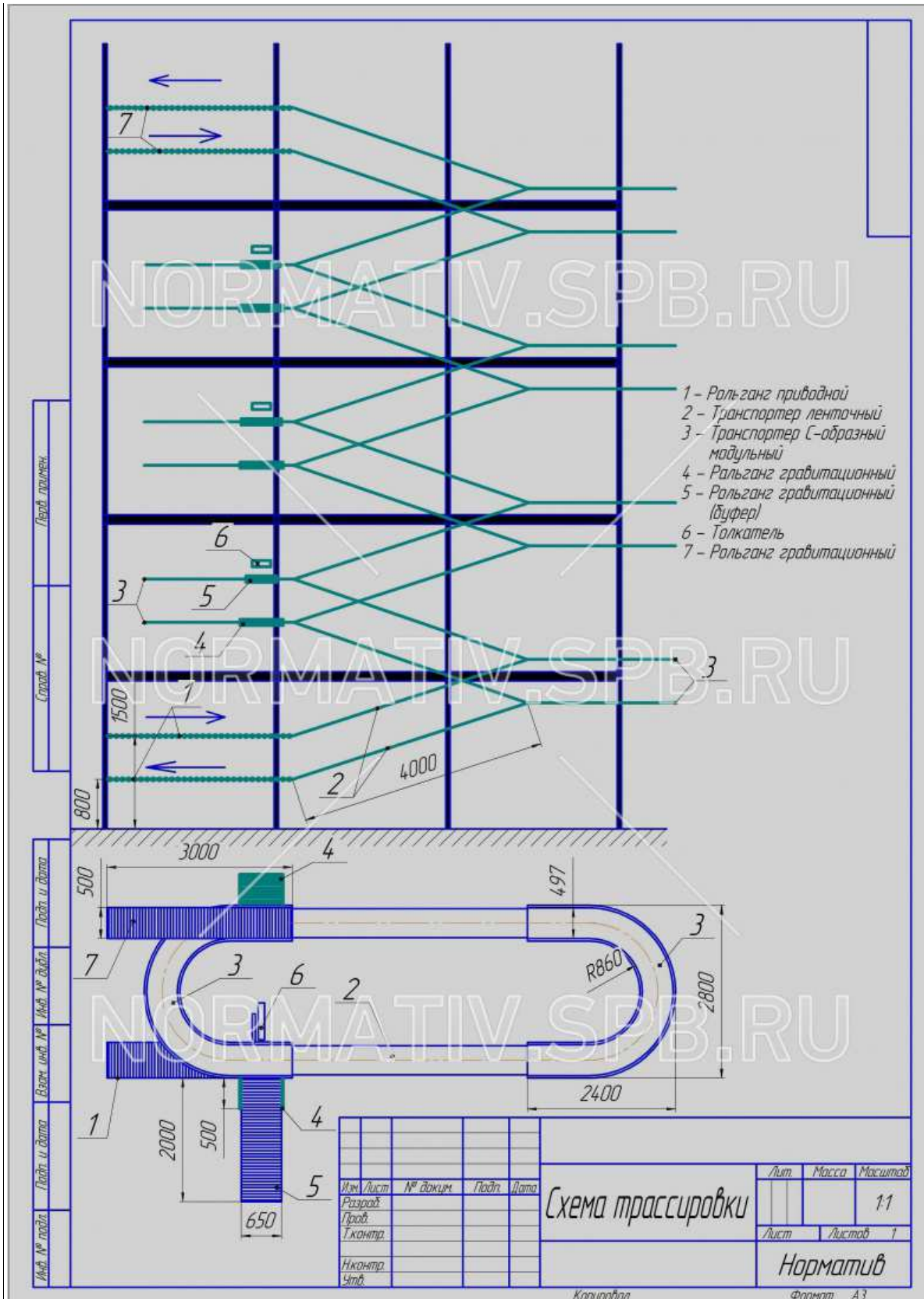
Throughput on the descent and replenishment, containers/hour	640
Height levels, mm	2800
	5300
	7800
	10300
Operating ambient temperature, °C	+ 5 → +35

### Loaded product characteristics

Type	plastic containers
Dimension area (LxWxH), mm	600 x 400 x 350
Weight, kg	50
Orientation of product input and output	short-edge first



### Illustrations



Pic. 4. The product movement plan



### 3. The automatic conveyor system ladder type for lifting and lowering plastic boxes in the 4-level warehouse

#### Job description conveyor system

Conveyor system consists of two streams: one for the descent of the goods, the other to replenish floors with the empty containers. The conveyors mounted on similarity of stairway arranged one above the other, with a distance sufficient for passage of containers.

System has an adjustable speed. It combines two tasks: the descent of full boxes from all the floors to 0 level and deliver empty boxes to the levels from where the product was descent. Available modes: simultaneous automatic work on the descent and replenishment and separately (only for the descent or replenishment).

At each level of both streams there are installed transfer conveyors (belt chain) to let the flow move from one to another inclined conveyor.

In the work area on each level offered elongated components for styling product or selection of empty boxes.

APCS provides tracking the passage of the containers by built-in sensors, is equipped with a programmable controller.

The **additional equipment** includes:

The control system with a controller, the emergency button on each floor, storage and providing conveyors, the sensors to control the overflow and defining the presence of the box for the descent

#### Specification

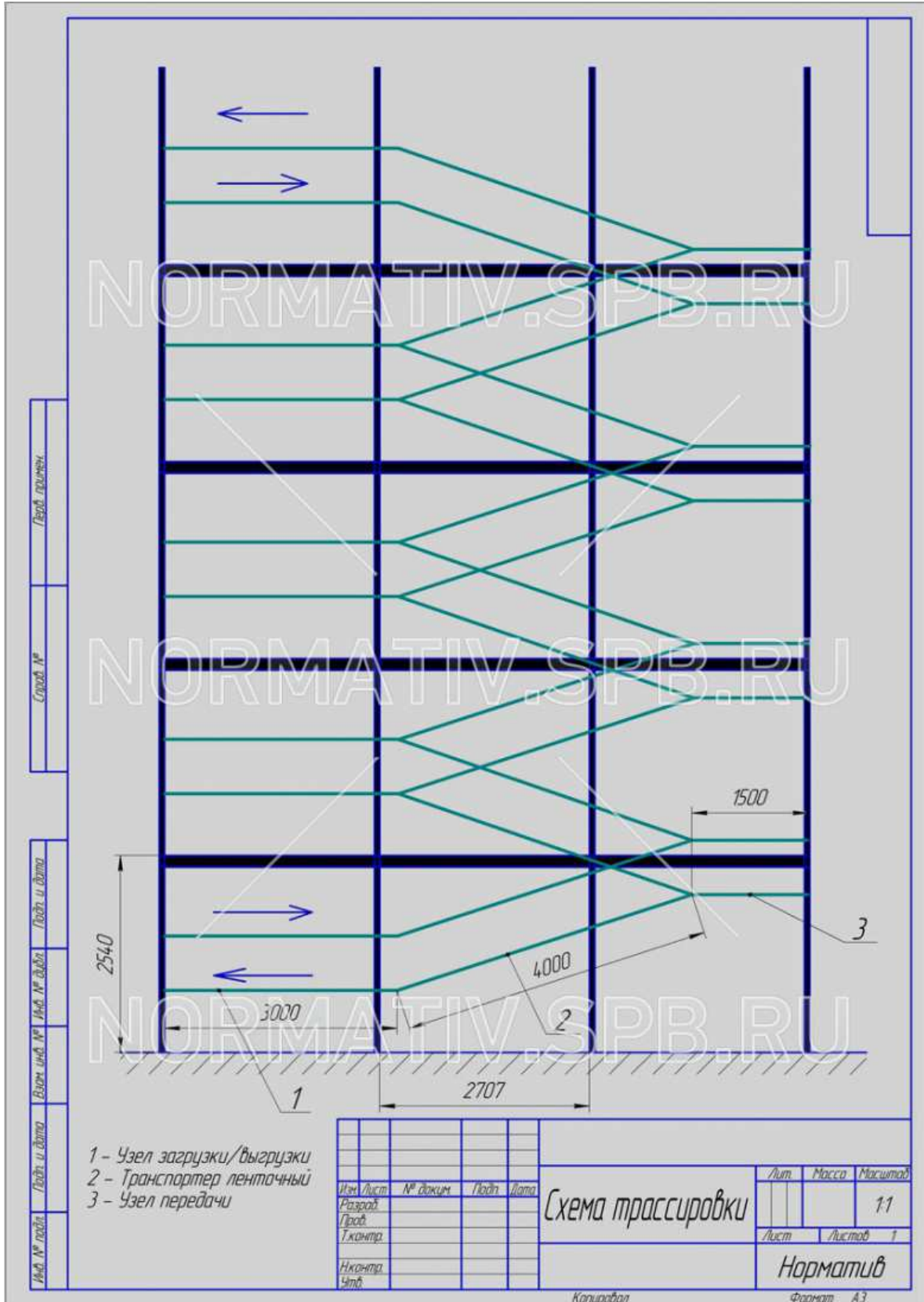
Throughput on the descent and replenishment, containers/hour	640
Height levels, mm	2800
	5300
	7800
	10300
Operating ambient temperature, °C	+ 5 → +35

#### Loaded product characteristics

Type	plastic containers
Dimension area (LxWxH), mm	600 x 400 x 350
Weight, kg	50
Orientation of product input and output	short-edge first



### Illustrations



Pic. 5. The product movement plan

#### 4. Carousel multilevel conveyor for lifting and lowering the plastic boxes in a 3-level warehouse

##### Job description conveyor system

The vertical carousel conveyor is used as a main equipment for the descent plastic boxes with the goods in a three-story warehouse to the ground floor and for automatic replenishment these levels with empty boxes.

The scope of supply includes: two (input and output) fixed drive roller conveyor on the ground floor, inductive and photo sensors, six folding pneumatic roller sorter

Carousel conveyor has ten lifting sections, each with a pitch between approximately 2.2 m. The speed is fixed, the rotation is counterclockwise. To increase productivity, it is possible to increase the number of lifting sections, by reducing the step between them.

17

The **additional equipment** includes:

The control system with a controller, the emergency button on each floor, storage and providing conveyors, the sensors to control the overflow and defining the presence of the box for the descent.

##### Specification

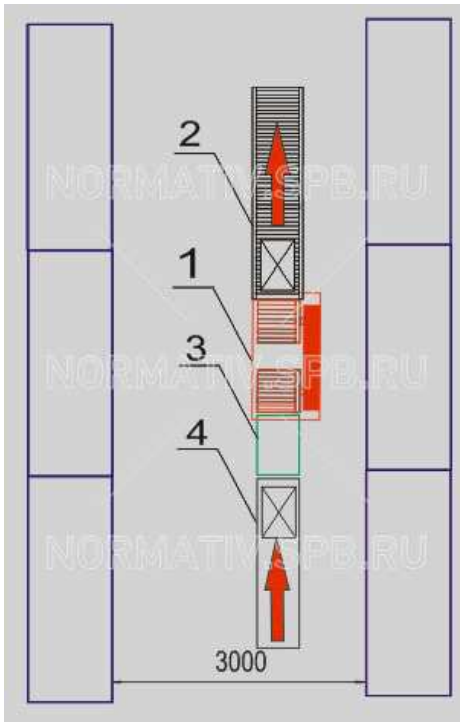
Area, mm	1600 x 1200
Dimensions elevating section, mm	700 x 500
Throughput on the descent and replenishment, containers/hour	640
Productivity, pcs./ hour:	
- containers with the product	320
- empty containers	320
Height levels, mm	2800
	5300
	7800
	10300
Operating ambient temperature, °C	+ 5 → +35

##### Loaded product characteristics

Type	plastic containers
Dimension area (LxWxH), mm	600 x 400 x 350
Weight, kg	50
Orientation of product input and output	short-edge first



### Illustrations



- Pos. 1 - Folding pneumatic non-driving sorter
- Pos. 2 - Cumulative gravity inclined roller conveyor (has a sensor against overflow)
- Pos. 3 - Modular conveyor (divided into two independent parts)

Pic. 6. Plan of a loading and unloading at the ground floor of a warehouse



Pic. 7. Vertical carousel conveyor with lifting sections

## 5. Automated system for raising and lowering the trolleys-grids with goods in the four-level mezzanine

### Job description conveyor system

The system consists of two vertical lifting devices, one works only on the rise of the trolleys, the second on the descent only. The additional equipment is considered to supply and deliver trolleys on the floors of the mezzanine.

As the main equipment is used vertical 5-level lifter (carousel conveyor), which is mounted in a protective mine, closes by a safety enclosure, made of anodized aluminum profiles and decorative galvanized protective mesh. The lift's platform for loading and unloading trolleys is equipped with a reversing modular conveyor.

To lift the trolleys-grids with goods the operator on the ground floor selects the desired floor on the remote control, upon completion the platform automatically returns to 0 level mezzanine and waits for the next command. For descent trolleys the operator gives a command "to descend" on the button post.

The **additional equipment** includes:

The control system with a controller, the emergency button on each floor, storage and providing conveyors, the sensors to control the overflow and defining the presence of the trolley-grid.

### Specification

Total lift capacity, kg	1200
Bandwidth, ascent / descent per hour	25
The speed of the platform, min / second	0,45
Height levels, mm	0
	3010
	5260
	7510
	9760
Operating ambient temperature, °C	+ 5 →+35

### Loaded product characteristics

Type	trolley-grid
Dimension area (LxW), mm	1200 x 800
Weight, kg	300
Orientation of product input and output	long-edge first

The trolley is equipped with swivel wheels with locking, height 100 to 180 mm.

**\*This equipment can also be used for the pallets**

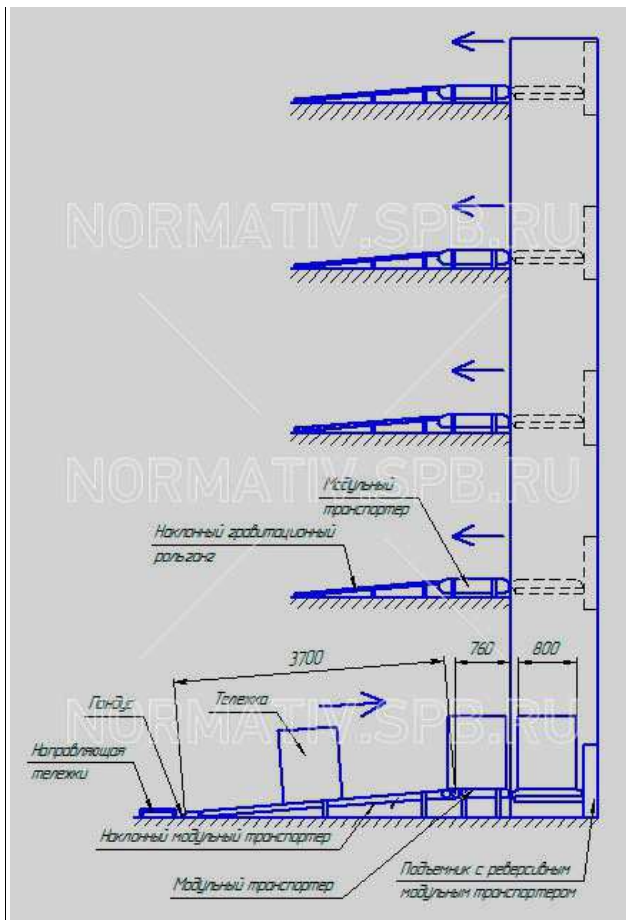
### Illustrations



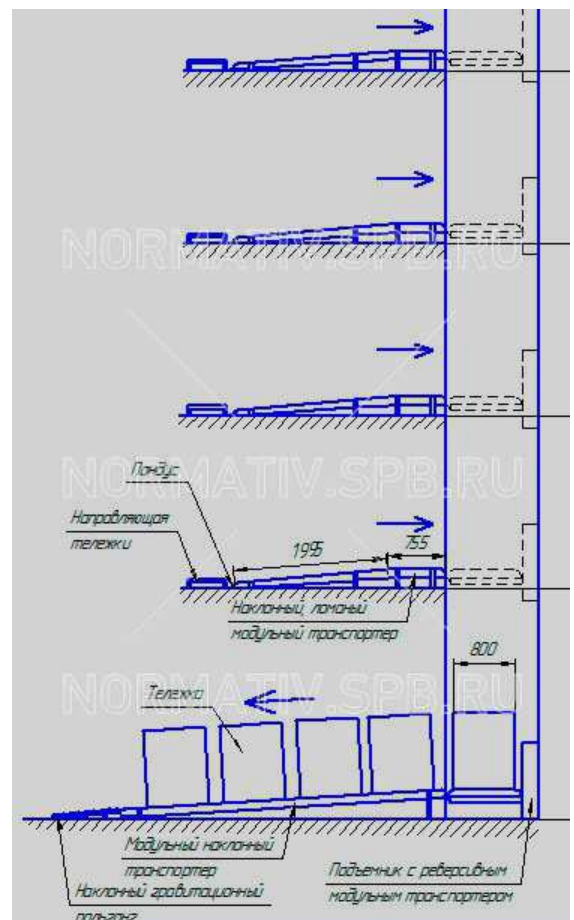
Pic. 8. Trolley-grid



Pic. 9. Vertical conveyor



Pic. 10. Lifting trolley plan



Pic.11. Descent trolley plan