

Railing System

BH02

ASSEMBLY & OPERATION MANUAL





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BH-02

Assembly & Operation Manual



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Dear Customers!

*Thank you for choosing PERCo railings.
Please follow the instructions given in the Manual carefully,
and this quality product will provide many years of trouble-free use.*

Assembly and Operation Manual for the **BH-02 waist-high railing** (hereinafter – **the Manual**) contains data that is necessary for the most full use of operating advantages of the turnstile as well as chapters on packaging, installation and maintenance.

Abbreviations:

BD – blocking device.

1 APPLICATION

BH-02 waist-high railing (hereinafter – the railing) is designed to form passageways and to complete the design of entrance points of industrial facilities, banks, administrative buildings, retail outlets, railway terminals, airports, etc.

The railing is a modular construction that consists of standard sections. Each section consists of vertical posts and horizontal rails and it is made of stainless steel in the similar style with PERCo turnstiles and swing gates. It is possible to form a railing system of any configuration by selecting sections and its elements. There are two main types of sections:

- **Stationary railing section** with filler panel (see Fig. 1) or without filler panel (see Fig. 2 and Fig. 3), designed to form passageways. The filler panel is made of tinted glass or polycarbonate sheet.
- **Rotary railing section**, designed to form passageways and provide emergency exit. There are two versions: the rotary section with mechanical BD (see Fig. 4) and the rotary section with electromagnetic BD (see Fig. 6).

Electromagnetic BD is unblocked by electric signal either from an emergency button or from the access control system or from the switch that de-energizes the rotary section. When the power is off the section will unblock automatically. In such case the swing panel can be opened in both directions.

The rotary section with electromagnetic BD is designed in accordance with anti-panic function. The swing panel opens without any additional keys or special tools if the force applied to it exceeds 60 kgf. An emergency opening causes no damage to the swing panel and it can be closed again.

2 OPERATION CONDITIONS

The turnstile with regard to resistance to environmental exposure complies with GOST15150-69, category NF3.1 (operation in self-ventilated premises without climate control).

Operation of the turnstile is allowed at ambient air temperature from -10°C to +40°C and at relative air humidity of up to 75% at +15°C.

3 TECHNICAL SPECIFICATIONS

| | |
|------------------------------------|---------|
| Post height | 1000 mm |
| Post diameter | 50 mm |
| Rail diameter | 32 mm |
| Rotary section pipe diameter | 32 mm |

Types of standard railing sections and their dimensions are shown at Figures 1 – 7.

For **BH-02 2-04/EL**, **BH-02 2-05/EL**, **BH-02 2-06/EL** posts with electromagnetic BD:

| | |
|---|-----------|
| Operating voltage | 12±1.2 V |
| Power consumption | max 8.5 W |
| Output current the power source shall provide at the nominal rating | min 0.7 A |

4 DELIVERY SET

4.1 Standard delivery set

Main equipment:

Elements of railing section



Note:

Delivery set depends on the list of elements ordered by a customer. The list of available elements for stationary and rotary sections is given in Tables 2 - 4.

Service documents

| | |
|------------------------|---|
| Operation manual | 1 pc. per unit |
| Certificate | 1 pc. per each post with electromagnetic BD (BH02 2-04/EL, BH02 2-05/EL, BH02 2-06/EL) |

4.2 Optional equipment supplied on request

Further equipment and installation tools can be provided additionally to the delivery set by request.

Additional equipment:

BH-01 0-03 bracket with a mounting kit for a reader to be installed on a vertical post

Filler panel for stationary section made of tinted glass or polycarbonate sheet

BH-01 0-02 clip

to fix the filler panel 4 pcs. per filler panel

Power supply (1 A) for post with electromagnetic BD.

Additional installation tools:

Anchor bolt M10×60 (DIN 7984 stainless steel., internal hex) with anchor PFG IH 10 (by «SORMAT», Finland) to fix vertical posts to the floor 3 pcs. per post

5 PRODUCT DESCRIPTION

5.1 Types of railing sections

Types of railing sections and their dimensions are shown at Figures 1 – 7.

Elements with asterisked dimensions are produced in several versions (see Tables 2 - 4).

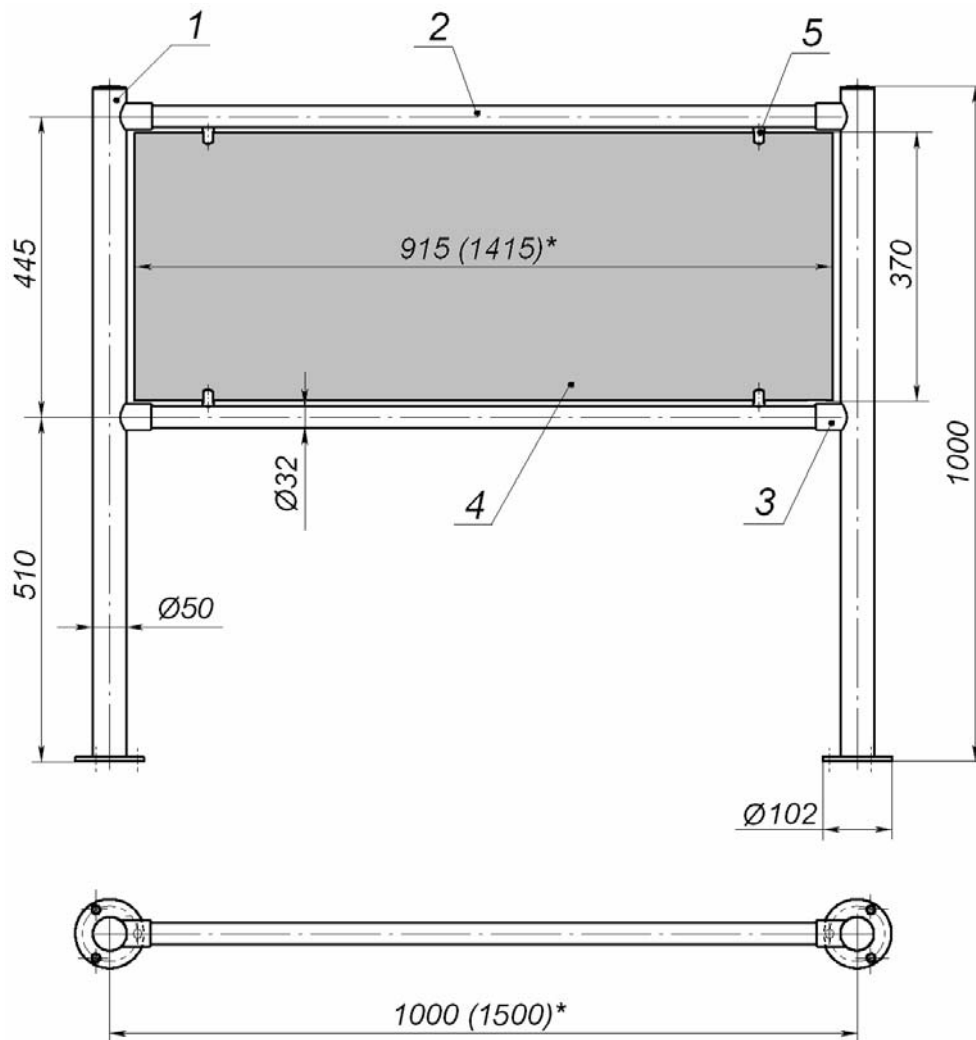


Fig. 1 Stationary railing section with filler panel:
 1 – vertical post; 2 – rail; 3 – coupling fitting;
 4 – filler panel (glass or polycarbonate sheet); 5 – clip

(* – see Table 2 for versions)

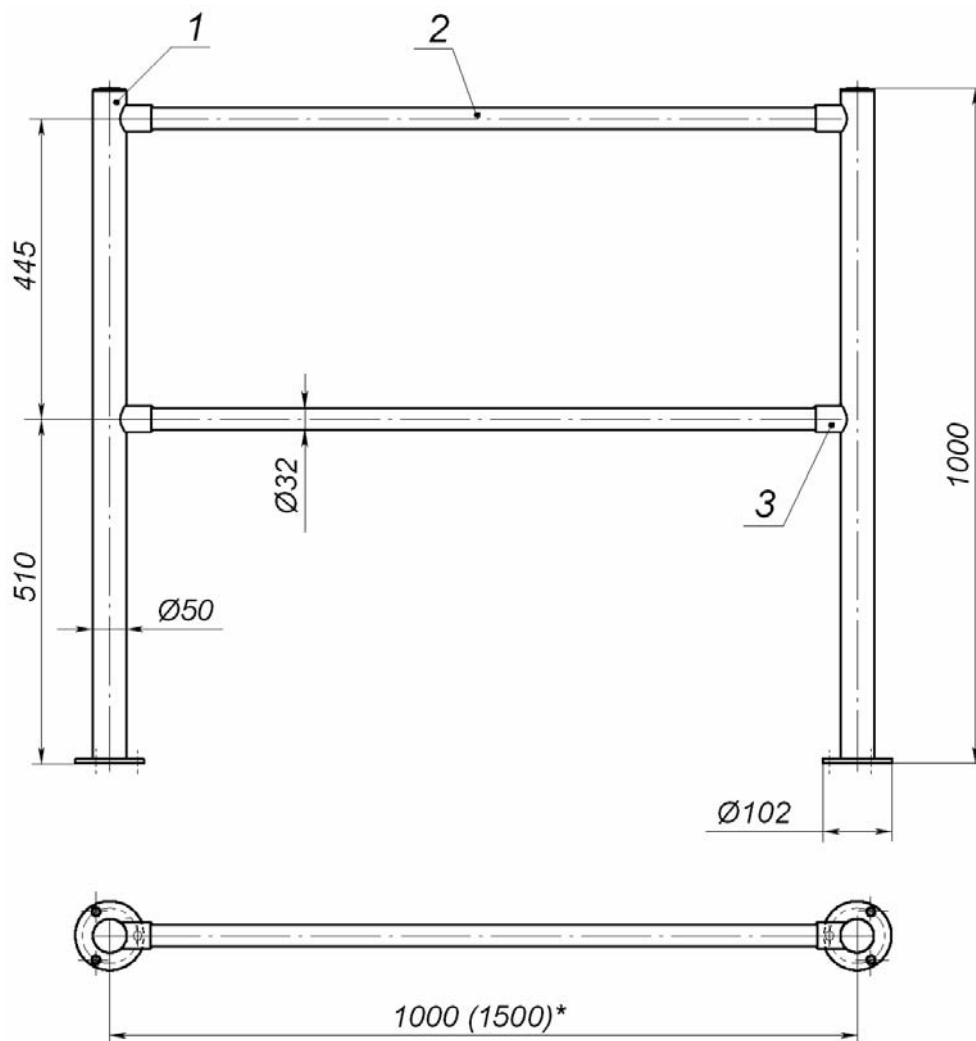
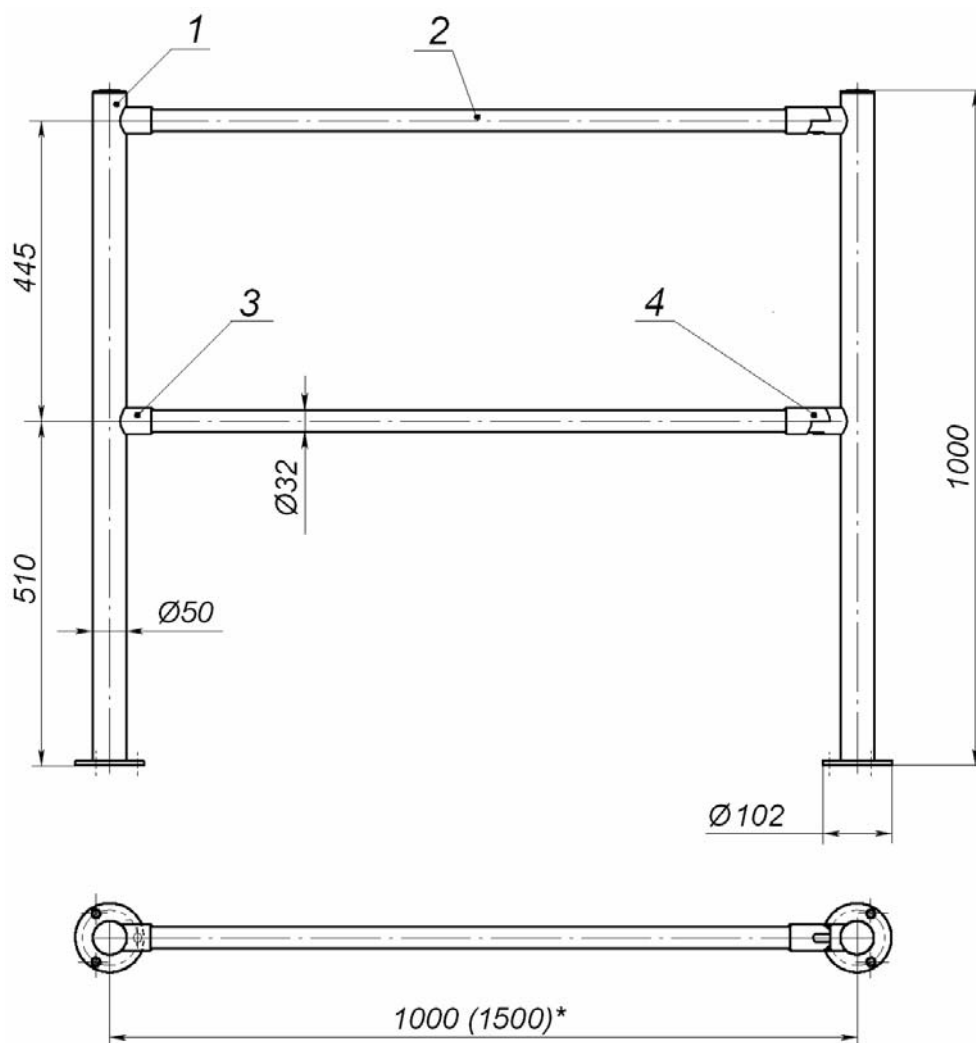


Fig. 2 Stationary railing section without filler panel:
1 – vertical post; 2 – rail; 3 – coupling fitting

(* – see Table 2 for versions)



**Fig. 3 Stationary railing section without filler panel
and with adjustable coupling fittings:**
1 – vertical post; 2 – rail;
3 – coupling fitting; 4 – adjustable coupling fitting

(* – see Table 2 for variants)

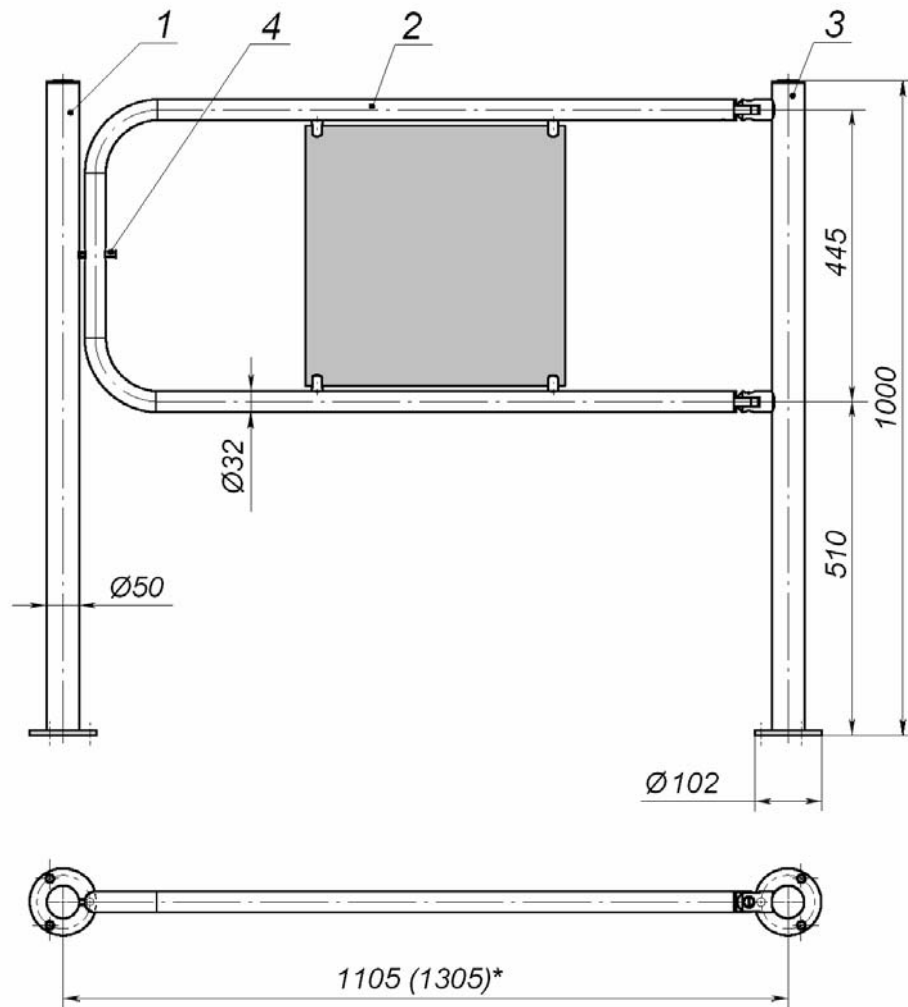


Fig. 4 Rotary railing section with mechanical BD:
1 – vertical post; 2 – swing panel with mechanical BD;
3 – support post; 4 – handle of mechanical BD

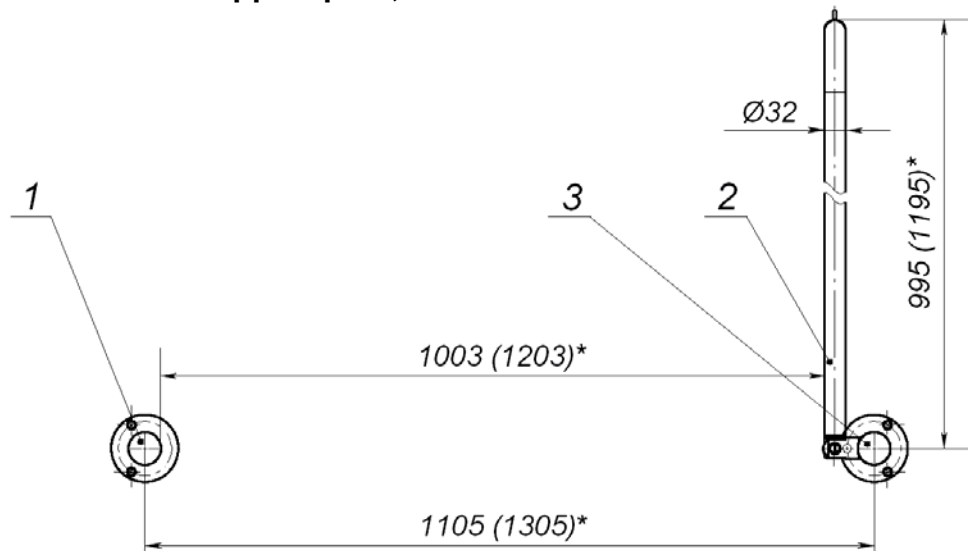


Fig. 5 Rotary railing section with mechanical BD in the open state:
1 – vertical post; 2 – swing panel; 3 – support post

(* – see Table 3 for variants)

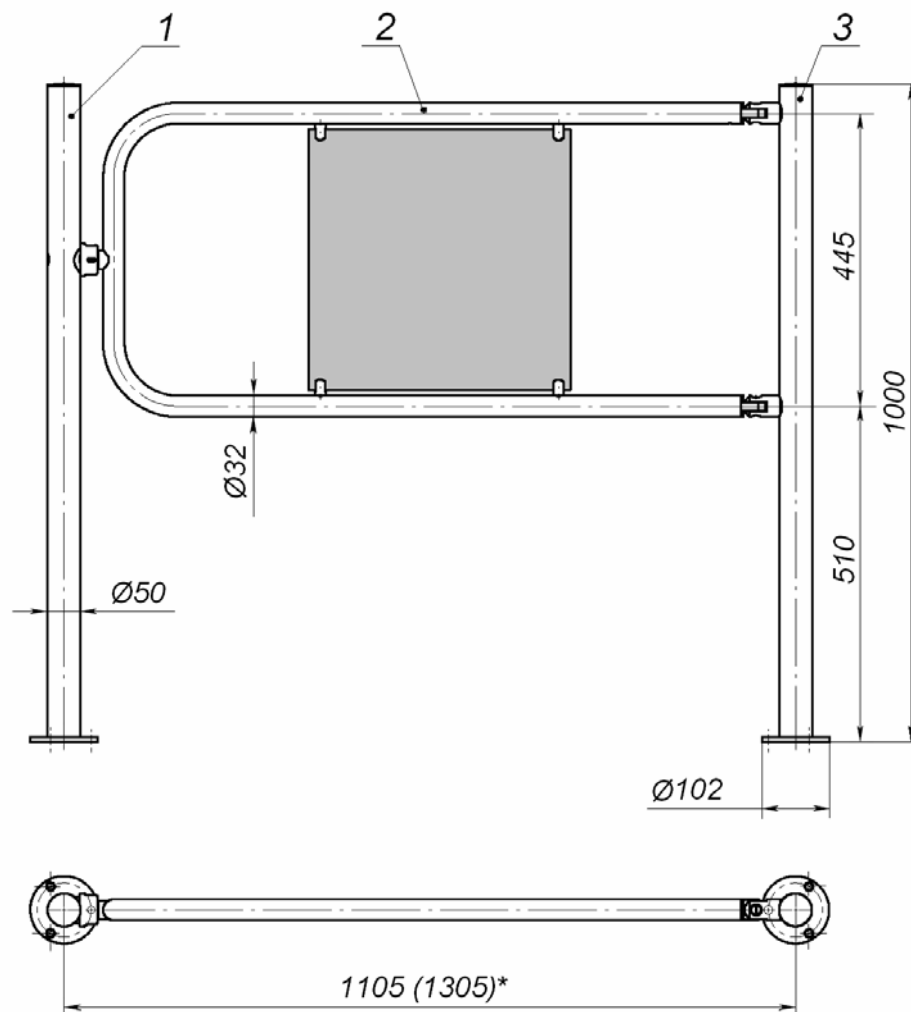


Fig. 6 Automatic rotary railing section with electromagnetic BD:
 1 – post with electromagnetic BD; 2 – swing panel; 3 – support post

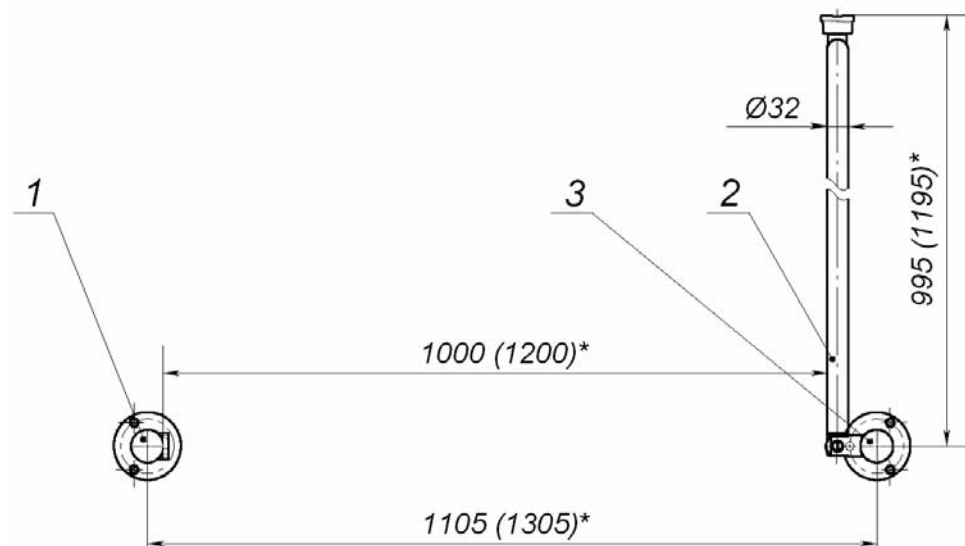


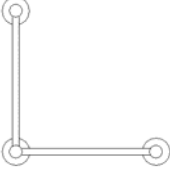
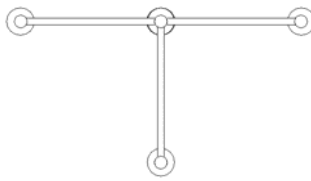
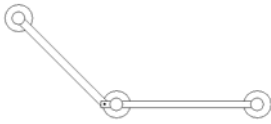


Fig. 7 Automatic rotary railing section with electromagnetic BD in the open state:
 1 – post with electromagnetic BD; 2 – swing panel; 3 – support post
 (* – see Table 4 for variants)

5.2 Connection of stationary railing sections

Table 1 contains variants of connection of stationary railing section. Description of elements is given in the Table 2.

Table 1 Variants of connection of stationary railing section

| № | Name and scheme | Railing elements | | | | | |
|---|---|------------------|------------------|-------------------|-------------------------------|--|-------------------|
| | | End post | | | Centre post | | |
| | | Post type | Coupling fitting | | Post type | Coupling fitting | |
| | | | Type | Quantity per post | | Type | Quantity per post |
| 1 | Single section  | BH02 2-00 | BH01 0-00 | 2 | — | — | - |
| 2 | Straight connection  | BH02 2-00 | BH01 0-00 | 2 | BH02 2-01 | BH01 0-00 | 4 |
| 3 | L-shape connection  | BH02 2-00 | BH01 0-00 | 2 | BH02 2-02 | BH01 0-00 | 4 |
| 4 | T-shape connection  | BH02 2-00 | BH01 0-00 | 2 | BH02 2-03 | BH01 0-0. | 6 |
| 5 | Adjustable connection at any angle  | BH02 2-00 | BH01 0-00 | 2 | BH02 2-01 или BH02 2-02 | BH01 0-00 и BH01 0-01, (adjustable) | 2 2 |

5.3 Elements of railing sections

Table 2 Elements of stationary sections

| Type | Technical data | Description |
|-----------|---|-------------------------------------|
| BH01 0-00 | Standard coupling fitting (with fasteners) | – |
| BH01 0-01 | Adjustable coupling fitting (with fasteners) | – |
| BH01 1-00 | Rail | Length 915 mm |
| BH01 1-01 | | Length 1415 mm |
| BH02 2-00 | One-way post with two holes for coupling fittings. | End post |
| BH02 2-01 | Two-way post with four holes for coupling fittings (180° angle arrangement) | Centre post for straight connection |
| BH02 2-02 | Two-way post with four holes for coupling fittings (90° angle arrangement) | Centre post for L-shape connection |
| BH02 2-03 | Three-way post with six holes for coupling fittings (90° and 180° angles) | Centre post for T-shape connection |



Note:

BH02 2-00, BH02 2-01, BH02 2-02, BH02 2-03 are used as support posts for swing panels of rotary railing sections.

Table 3 Elements of rotary section with mechanical BD

| Type | Technical data | Description |
|-----------|---|-------------------------------------|
| BH02 1-14 | Swing panel with black joints for rotary section with mechanical BD | Passage width 1000 mm |
| BH02 1-15 | | Passage width 1200 mm |
| BH02 2-14 | Post with a hole for stopper unit | End post |
| BH02 2-15 | Post with a hole for stopper unit and two holes for coupling fittings on the side opposite to swing panel | Centre post for straight connection |
| BH02 2-16 | Three-way post with a hole for stopper unit and six holes for coupling fittings (90° и 180° angles) | Centre post for T-shape connection |

Table 4 Elements of automatic rotary section with electromagnetic BD

| Type | Technical data | Description |
|--------------|--|-------------------------------------|
| BH02 1-04/EL | Swing panel with black joints for automatic rotary section with electromagnetic BD | Passage width 1000 mm |
| BH02 1-05/EL | | Passage width 1200 mm |
| BH02 2-04/EL | Post with electromagnetic BD | End post |
| BH02 2-05/EL | Post with electromagnetic BD and two holes for coupling fittings on the side opposite to swing panel | Centre post for straight connection |
| BH02 2-06/EL | Three-way post with electromagnetic BD and six holes for coupling fittings (90° и 180° angles) | Centre post for T-shape connection |

5.4 Main features of automatic section post with electromagnetic BD

Post is operated with a maximum 14 V voltage, safe for humans.

Post has low power consumption in blocked mode (when it is energized and contacts «Control» and «GND» are closed) – maximum 8.5 W.

Post board includes (see Fig. 8):

- *X1* connector to connect power supply and control circuits. Cable «+» of power source *A3* (see Fig. 16) is connected to 1/*X1* «+12V» terminal, cable «-» is connected to 2/*X1* «GND» terminal. 3/*X1* «Control» and 4/*X1* «GND» terminals are used for connection of *FA* emergency unblocking device (*A4* on Fig. 16).
- *X2* connector to connect electromagnet (connection is already performed, polarity is not sufficient).
- *Z1* connector to connect ground circuit, if necessary.

Connection layout is shown on Fig. 16.

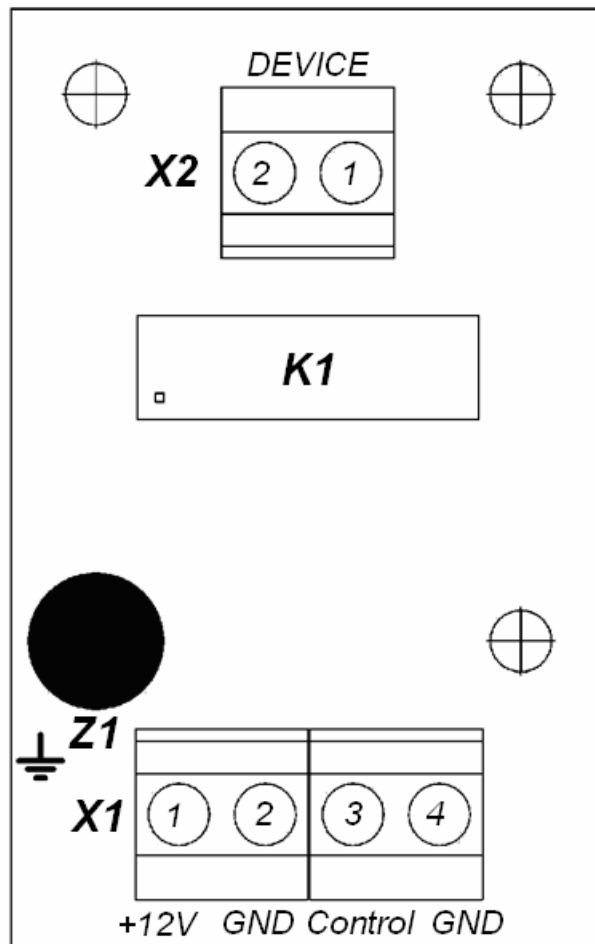


Fig. 8 The board

5.5 Operation of electromagnetic BD

Operation of post is controlled with a button or emergency unblocking device.

Open relay contact or circuit with open collector output may be used as an operating element of emergency unblocking device.

In order to block the passage it is necessary to energize the post and to close “*Control*” and “*GND*” contacts with a button or emergency unblocking device (circuit with control relay) or to send a low-level signal (circuit with open collector). In such case electromagnet is energized through K1 relay on the board (see Fig. 8).

If it is necessary to unblock the passage, “*Control*” – “*GND*” circuit shall be opened (or switched into high input resistance mode – for emergency unblocking device with open drain output), in such case electromagnet will be de-energized and the passage will be unblocked.



Attention!

The heating of electromagnet shall not be considered as a malfunction of the device (heating up to +60°C is allowed).

5.6 Automatic unblocking of electromagnetic BD

Requirements for control unit of emergency unblocking device.

Output control contact of «*Control*» board is energized with +12V voltage, the ohmic resistance of the circuit (relay coil) is 0.5 ... 1.5 kOhm.

Control element of emergency unblocking device shall provide following signal characteristics:

| | |
|---|-------------|
| Switching current | min 20 mA |
| Closed contact resistance | max 100 Ohm |
| Low level voltage in open collector output scheme | max 0.8 V |

Passage unblocking will occur in case of external power loss regardless of the state of the «*Control*» circuit.

Jumper is installed on «*Control*» and «*GND*» connectors. It shall be taken off to connect emergency unblocking device.

6 MARKING AND PACKAGING

Railing in standard delivery set is packed in transportation boxes in order to protect them from the damage during transportation and storage.

Overall dimensions and weight of transportation boxes depend on type and quantity of ordered elements of railing sections.

Boxes are labeled with the name of packaged product. Each box contains a packing list.

7 SAFETY REQUIREMENTS

7.1 Safety requirements during installation

The installation shall be carried out only by persons who have carefully studied this manual, in accordance with general installation requirements.



Attention!

During installation:

- Use only serviceable tools;
- Perform all works with de-energized and disconnected power supply units;
- Install power supply units and other additional equipment of automatic rotary section with electromagnetic BD in accordance with safety requirements, given in manuals of this equipment;
- Before the first turn-on of automatic rotary section with electromagnetic BD make sure that it is installed correctly;
- Install cables in accordance with electrical installation requirements;
- During the installation of the railing sections one should be especially careful to prevent them from falling.

7.2 Safety requirements during operation

Follow general safety requirements for electrical devices, when using automatic rotary section.



It is not allowed to:

- To use automatic rotary section in the conditions, which do not correspond with necessary operation conditions.
- To energize automatic rotary section with the voltage not corresponding with technical specification.

Power supply units shall be operated in accordance with safety requirements, given in their manuals.

8 INSTALLATION

8.1 General recommendations



Attention!

Install equipment in accordance with safety requirements (see Clause 7.1).

Installation of railings is an important operation which impacts serviceability and life time of the product. Prior to installation works carefully study this section and follow the instructions given here.



Attention!

The manufacturer is not liable for the damage of railings or any other equipment, as well as for other damages caused by improper installation and rejects any claims of the customer if installation was performed with violation of the manual instructions.

Installation recommendations:

- At least two qualified installers should carry out installation works.
- Install railings on strong and level concrete or stone foundations (concrete with characteristics not less than mark 400, strength B22.5), at least 150 mm thick.
- If the foundation is not strong and level enough use reinforced foundation plates of 300×300×300 mm size.
- Before the railings installation check the horizontality and flatness of the foundation and align it if necessary; the maximum allowable deviation is 1.5 mm.
- Apply «SORMAT» anchor bolts for the installation.

Recommendations on holes arrangement for post installation are given in regard to use of anchor bolts *PFG IH 10* 16×60 mm produced by “SORMAT” for solid concrete floors. 3 anchor bolts per one post are used.

8.2 Tools and equipment, necessary for installation

- 1,2 - 1,5 kW hammer drill;
- Ø 16 mm hard alloyed drill bits;
- Socket wrench S13; S17;
- Allen key S4; S6; S7; S8;
- Cross-head screwdriver №2 150 mm;
- Flat slot screwdriver № 5 150 mm;
- Callipers;
- Measuring tape 3 m;
- Plumb line and level.



Note:

The application of other instruments is allowed if it doesn't reduce the quality of installation works.

8.3 Installation of stationary railing section

Follow this order while installing railing section.

1. Unpack railing elements and check delivery set compliance.
2. Fix two coupling fittings to the both railing posts with M8×30 screws (see Fig. 9, Fig. 10). Screws are included into coupling fitting delivery set.

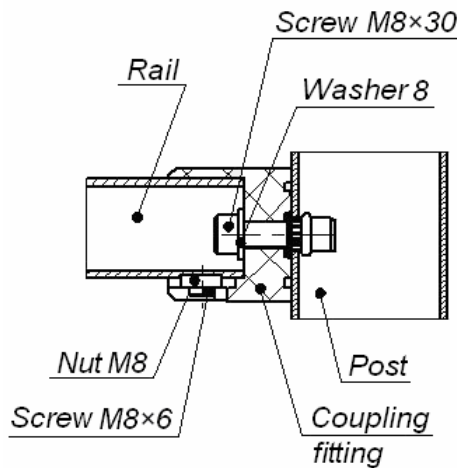


Fig. 9 Fastening of rails to posts using BH-01 0-00 standard coupling fittings

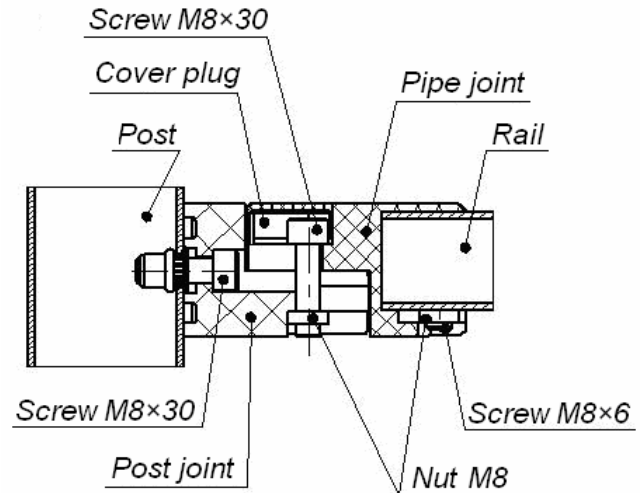


Fig. 10 Fastening of rails to posts using BH-01 0-01 adjustable coupling fittings

3. Put the first post in the required place so that coupling fittings location would correspond with the required rails position. Mark out three installation holes for anchor bolts through the holes in the flange (see Fig. 11). Put the post down.



Attention!

Be very careful when installing railing sections before they are fixed to the floor, prevent them from falling.

4. Prepare holes for installation of the first post. Insert anchors as deep as possible into the holes prepared.
5. Fasten the first post with bolts, tighten it only preliminary using little efforts, providing an opportunity of the deviation from the vertical section. Check with the level if the section is installed vertically (mounting pads may be used). Fasten the bolts properly.
6. Put the second post in the required place so that the distance to the first post would be equal to the rail length. Insert rails into coupling fittings of both posts, while holding them. Fix rails in the coupling fittings with M8×6 screws, tighten it only preliminary using little efforts. Screws are included into coupling fitting delivery set. Mark out three installation holes for anchor bolts through the holes in the flange. Unfasten screws, take out rails and put the post down.

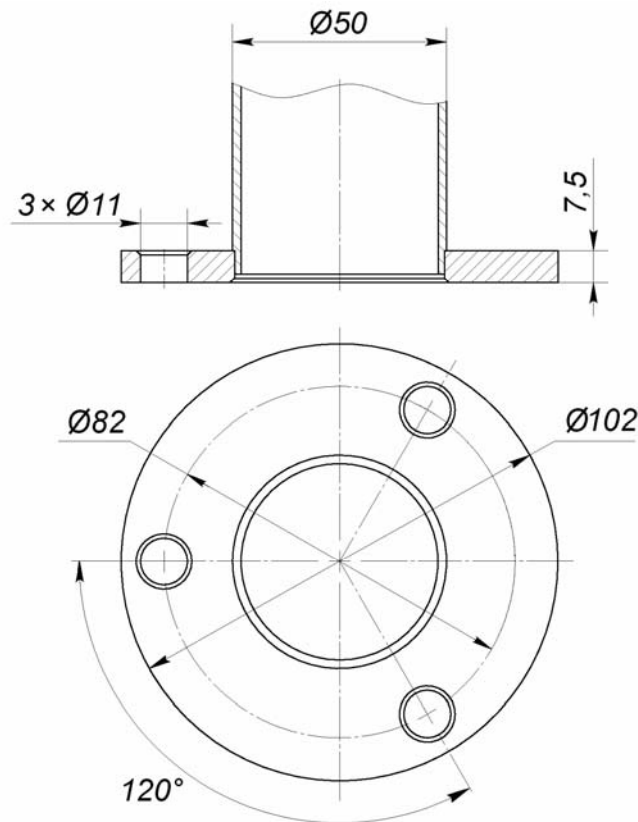


Fig. 11 Location of holes for anchor bolts in the flanges

7. Prepare holes for installation of the second post. Insert anchors as deep as possible into the holes prepared.
8. Put the second post above the holes.
9. Insert rails into coupling fittings of both posts, while holding the post. Fasten the second post with bolts; tighten them only preliminary using little efforts providing an opportunity of the deviation from the vertical section. Check with the level if the section is installed vertically (mounting pads can be used.) Fasten post bolts, then rail screws properly.
10. If it is necessary to connect several sections, perform their installation in accordance with the description given above.



Attention!

During the installation of railing section with filler panel (glass), perform the installation of the glass only when the installation of vertical posts and railings is finished.

11. Place glass fastenings symmetrically on the lower rail 100÷120 mm from the vertical post.
12. Insert the glass into glass fastenings. Put a rubber pad between the glass and glass fastening, which is included in the delivery set.
13. Fix the glass in glass fastenings by tightening the screws.
14. Put the glass vertically. Place glass fastenings symmetrically on the upper rail and put rubber pad inside of it (it is necessary to disassemble glass fastening for that).
15. Fix glass fastenings with the glass on the rail. Assemble other railing sections with glass in the same manner.

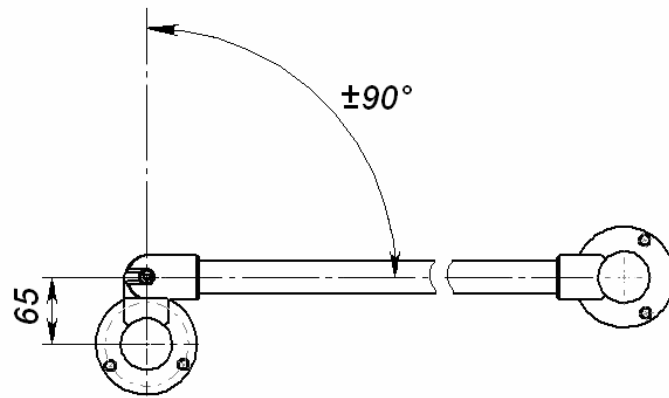


Fig. 12 Available turning angles for BH-01 0-01 adjustable coupling fitting

8.4 Installation of rotary railing section with mechanical BD

Follow this order while installing railing section.

1. Mark out the centers of railing posts.
2. Mark the points of flange fastening of vertical and support posts as depicted on Fig. 11 and Fig. 13 – each of two groups consisting of three $\text{Ø}16 \times 60$ holes for M10 anchors.

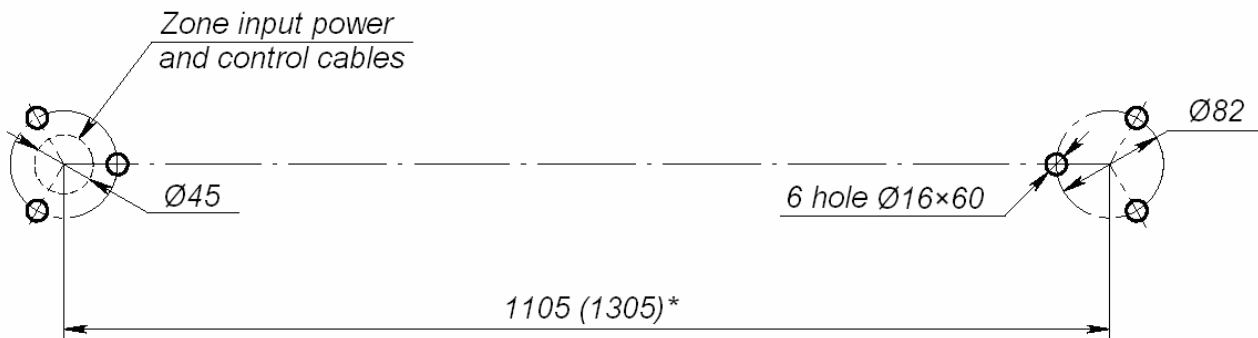


Fig. 13 Holes for anchor bolts in flanges of rotary railing section posts
(* – see Table 3 and Table 4 for variants)

3. Fix two drag links on the support post with two $\text{M}8 \times 25$ screws as depicted on Fig. 14.
4. Install the support post into working position and fasten using anchor bolts M10. Assemble joints with swing panel on the support post.
5. Install the vertical post into working position. The hole shall be oriented towards the swing panel of the rotary section.

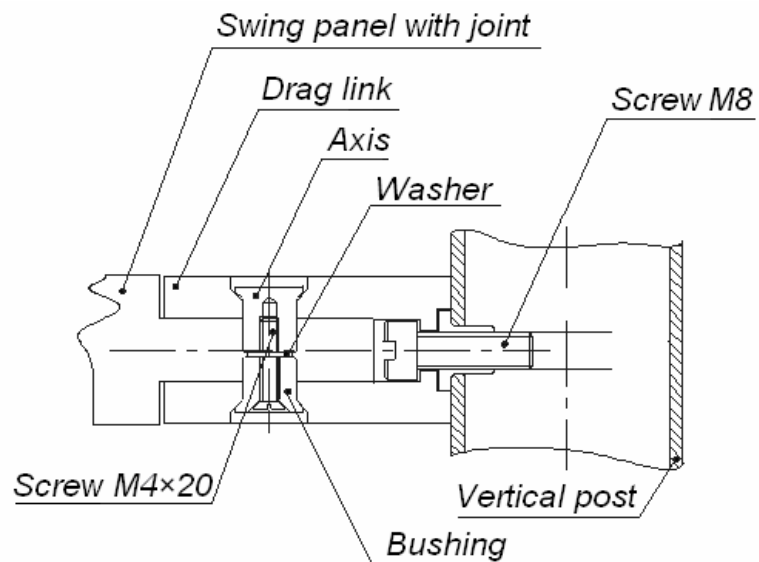


Fig. 14 Fastening of joints to the support post of rotary railing section

6. Push the rod. After the closure of the swing panel is performed the rod lowers thus fixing the swing panel in the corresponding groove.
7. Assemble other railing section in the same manner.

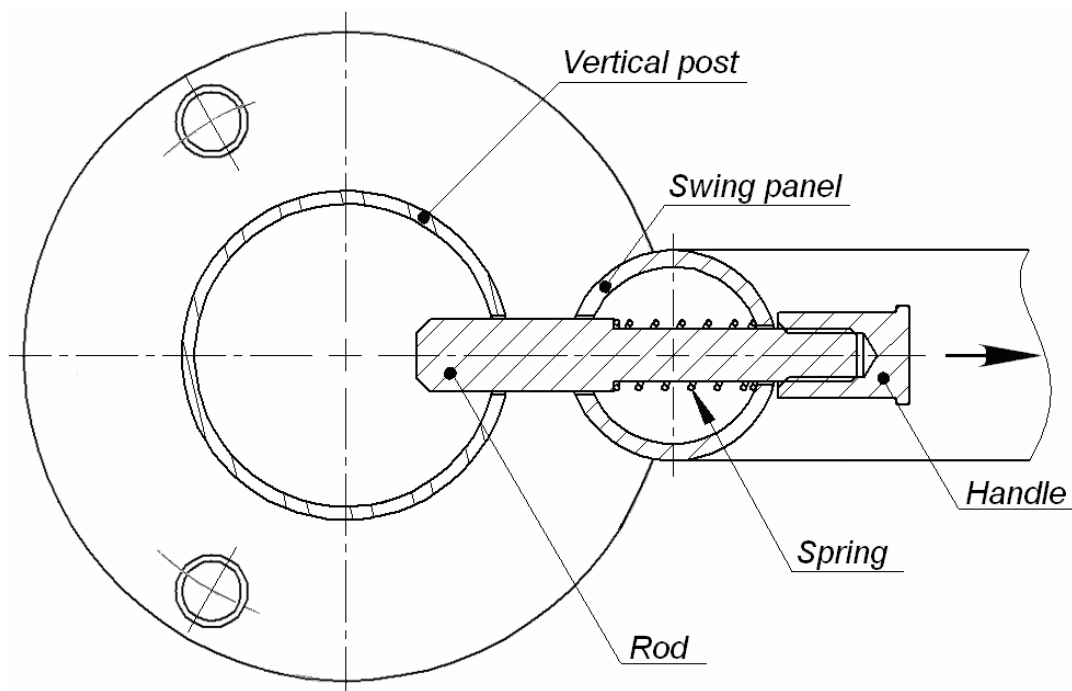


Fig. 15 Installation of the stopper unit rod

8.5 Installation of automatic rotary railing section with electromagnetic BD

8.5.1 Cables

Maximum cable length from emergency unblocking device to the post shall be set in accordance with Clause 5.6 if no impediment occurs. It is recommended not to exceed 100 m.

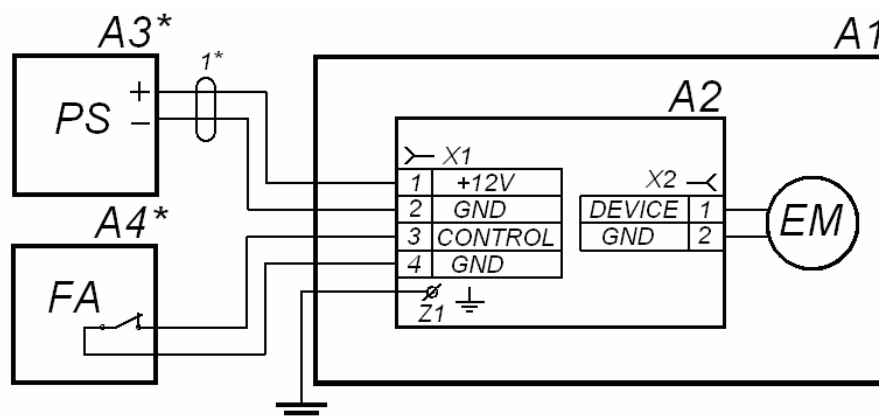
Maximum cable length from power supply unit to the post depends on cable size and shall be:

| | |
|-------------------------------------|-----------------|
| 0.2 mm ² cable (AWG 24) | max 15 m |
| 0.75 mm ² cable (AWG 18) | max 50 m |
| 1.5 mm ² cable (AWG 16) | max 100 m |

8.5.2 Installation

Follow this order while installing railing section. Necessary cables are set in Clause 8.5.1.

1. Mark out the centers of railing posts. Provide following distance between posts - 1105±2 mm (for 1 m railing section) and 1305±2 mm (for 1.2 mm railing section) in order to secure normal operation of electromagnetic BD (see Fig. 13 and Table 4).
2. Mark fixing points of post flanges of railing sections, as depicted on Fig. 11 and Fig. 13 – three Ø16×60 holes (M10 anchors) for each of two posts.
3. Prepare cable duct in the floor for power cable and control cable (see Fig. 13).
4. Fix two drag links on the support post with two M8×25 screws, as depicted on Fig. 14. Install the support post into working position. It is recommended to use 50×20×0,5...0,8 mm mounting pads in order to secure that posts were installed vertically.
5. Assemble joint units with swing panel on the support post.
6. Extract the board situated in the lower part of the post (inside the tube). The board is fixed with spring-actuated clip and can be easily extracted.
7. Connect power cable and control cable to the board in accordance with electric circuit scheme (see Fig. 16).



**Fig. 16 Electric circuit scheme of the post with electromagnetic BD
(see Table 5 for the list of elements)**

8. Install the post with electromagnetic BD into working position.
9. Assemble other railing section in the same manner.
10. Check all bolted connections and tighten if necessary.
11. Railing section is installed.

Table 5 List of elements electric circuit scheme

| Legend | Item | Q-ty | Note |
|---------------|------------------------------|-------------|---------------------------------|
| A1 | Post with electromagnetic BD | 1 | |
| A2 | Board | 1 | Included into post delivery set |
| A3* | Power supply source | 1 | Power unit (DC12V,1A) |
| A4* | Emergency unblocking device | 1 | |
| EM | Electromagnet | 1 | Included into post delivery set |
| 1* | Post power cable | 1 | See Clause 8.5.1 |
| Z1 | Ground contact on post board | | |

* Available upon request

9 TECHNICAL MAINTENANCE

It is recommended to lubricate moving parts of the stopper unit (see Fig. 15) of rotary railing section once per six months with lubricating oil.

10 TRANSPORTATION AND STORAGE

Railings in the original package should be transported in closed type cargo transport units only (trains, containers, closed vehicles, in the holds, planes, etc.).

During the transportation the boxes can be stacked in 5 rows.

Storage of the railings is allowed indoors at ambient temperature between -60°C and +50°C and at relative air humidity up to 80% at +27°C. The storage room should be free from acid vapors, alkalis and gases that can cause damage.

After the transportation and storage of the railings at low temperatures or at high air humidity it must be kept unpacked for not less than 24 hours indoors within normal climate conditions corresponding to the operation conditions prior to installation.

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