



# Lindab Doorline - Industrial Doors

## Technical information

# A safe and environmentally friendly industrial door system...

## Complies with the latest requirements for use and safety in accordance with EN 13241-1

Lindab Doorline is a versatile series of sectional garage doors with exceptional functionality, design and finish.

A high level of flexibility and numerous combination possibilities make it easy to "customise" the door so that it fits perfectly with all kinds of buildings and door apertures.

If you would like a door that admits a lot of light, then choose panorama sections (LDP). If insulating capacity is of crucial importance, select insulating sections (LDI). You can choose either option or have both features combined (LDC), and with the type of window you wish. Wicket doors can also be built into the door panel if needed.

The strong coating possibilities and array of colour options also contribute to profiling Lindab Doorline's sectional garage doors as ideal solutions, both architecturally and structurally.

Environmental impact and safety are also high priorities. With a choice of environmentally-friendly materials and well-developed safety precautions, Lindab Doorline is a leader in terms of environmental and safety considerations.

Quite simply, Lindab Doorline is high quality, individual solutions and consideration for both the environment and safety - on rails.

## Choice of rail system

It is important that, during the project design phase, the rail system, suspension, side space, clearance height etc. is taken into account so that the door can be adapted, mounted and function in the building as well as possible. Aim to get the rail system as close to the ceiling as possible. This provides the most stable suspension and optimal use of the room's height. The headroom, together with the roof pitch in the space, are the building

conditions that normally determine which rail system is best to use, but wishes regarding clearance height etc. can also be crucial (see pages 4-11).

## Doors in aggressive environments

Doors which are installed in aggressive environments such as livestock houses, car washes etc. where the effects of moisture, steam or similar can lead to corrosion of the door components should be equipped with stainless steel parts. You can see which parts can be ordered in stainless steel on pages 3-13 "Rail system" and on pages 12-13 "Door panels".

## Delivery and installation

Lindab Doorline is delivered and installed by arrangement for each

individual door solution.

After installation, the fitter will ensure the correct spring tension and balancing of the door panel so that the door will function optimally and is ready for use.

## Maintenance

According to the new CE-standards (EN 13241-1) it is a requirement that garage doors be regularly maintained. A minimum of one annual inspection by an authorised fitter is also required. With intensive use/aggressive environments it is recommended however that this takes place more often. Arrange a service agreement.

## More information

You are always welcome to contact Lindab A/S for more information, advice and guidance.

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# Rail system

## Main components

### Frame

1. Angled frame\* (left and right-facing)
2. Profile for spring support (can be ordered)

### Rail tracks

3. Vertical rail tracks\* (right/left-facing)
4. Spring door stops
5. Suspension brackets (see table on page 20 re. amount of suspension needed)

\*) Can be ordered in stainless steel for bracket types S, H and V.

### Spring system

6. Bearing plates (with spring break device as option)
7. Support bearings (how many depends on door spec.)
8. Spring shaft, Ø 25.4 mm (Ø 31.7 mm)
9. Springs (torsion springs with a "lifetime" of min. 15,000 openings and closings)

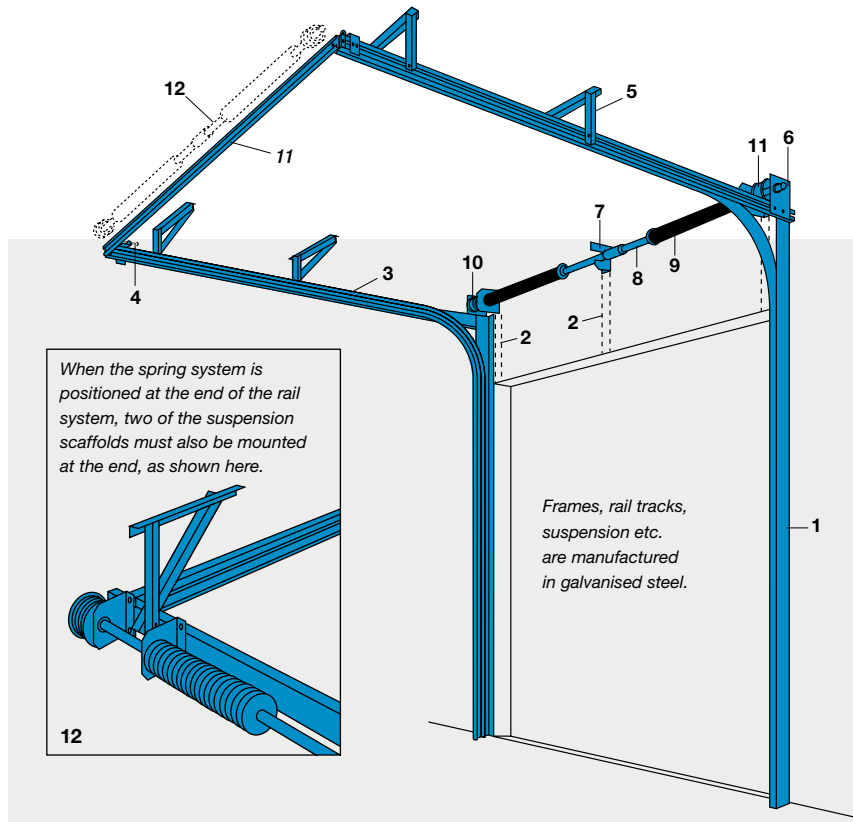
### 10. Wire drum

(Different types depending on the rail system and door size)

### 11. C-profile (not with L-brackets)

Used as a spacer and ensures that the rails are always parallel.

12. With low ceilings (L) the spring is placed at the end of the vertical rails. The bearing plates are mounted on horizontally positioned tubes that are attached to the ceiling rails.



## Reinforced solution for large doors

By using a 1¼" (Ø 31.7 mm) spring shaft and 2" reinforced rails, it is possible to supply doors that weigh up to 850 kg. The solution can also be used to reinforce industrial doors that are exceptionally wide or heavy.

|                                    | 1¼" shaft | 2" reinforced | max. door weight |
|------------------------------------|-----------|---------------|------------------|
| Door area > 28 ≤ 42 m <sup>2</sup> | X         | -             | -                |
| Door area > 42 m <sup>2</sup>      | X         | X             | 850 kg           |

Rails can be manufactured in the following combinations

|                  | S | H | L | V |
|------------------|---|---|---|---|
| Galvanised steel | ● | ● | ● | ● |
| Stainless steel  | ● | ● | ● | ● |

**Note:** It is not currently possible to produce reinforced 2" brackets in stainless steel.

## Mounting upright frames

**A.** The angled frame is supplied with integrated vertical rail tracks and an efficient side seal. The frame is normally screwed directly onto the wall with only a flush joint between. On particularly uneven walls, an extra jamb joint between the wall and the frame profile must also be expected. See the table re. fixing on page 20.

**B.** With lightweight/weak wall constructions, it may be necessary to use a reinforced frame, for example RHS profiles. This frame construction is an additional measure that can be supplied and installed by arrangement.

**C.** In situations where there is not enough room at the sides for the door frame, this is normally solved by mounting a suitable RHS profile in the door aperture as an underlay for the door frame.

Note: this reduces the effective door width by the dimensions of the RHS profile (min. 2 × 120 mm).

## Mounting horizontal rail tracks

Horizontal rail tracks are supplied with an integrated C-profile as reinforcement. The C-profile is used for the mounting of spring door stops and suspension, which using adjustable clamping plates is easier to install and adjust later.

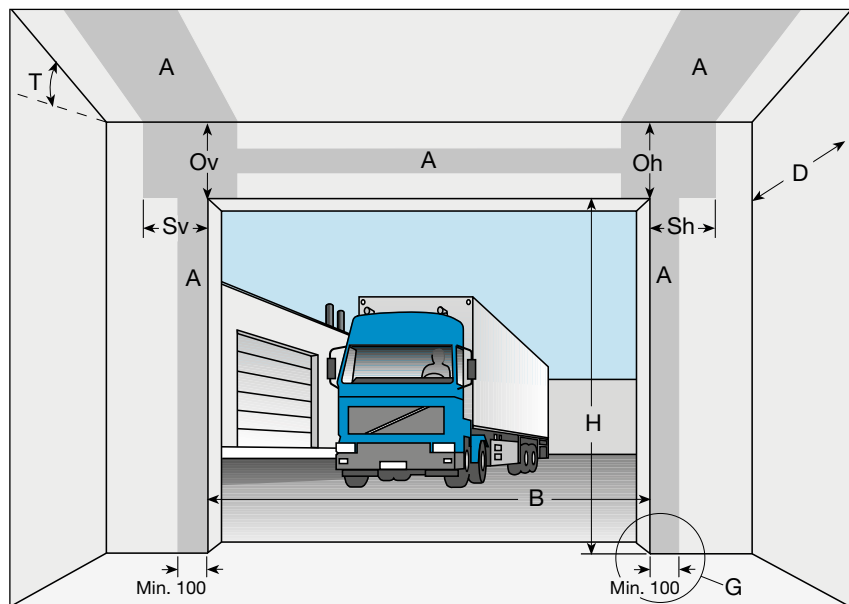
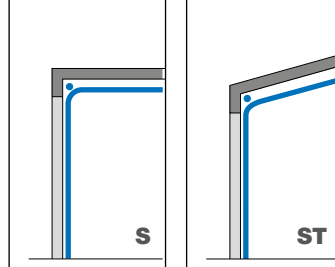
### Frame - measurements and mounting

**A.** Standard frame measurements and mounting.  
(The measurements listed are at floor level. (Higher up, both width and depth will be greater).

**B.** Lightweight wall reinforced with RHS frame construction.

**C.** RHS profile can provide the required side space where this is lacking. For low ceilings, see pages 8-9

# Standard Rail system: S and ST

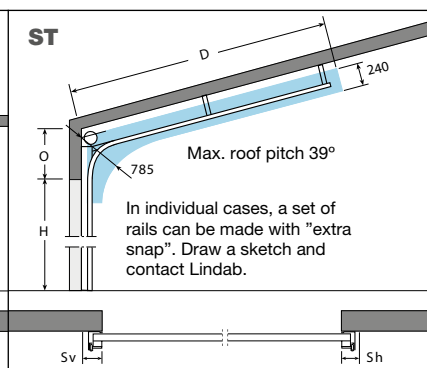
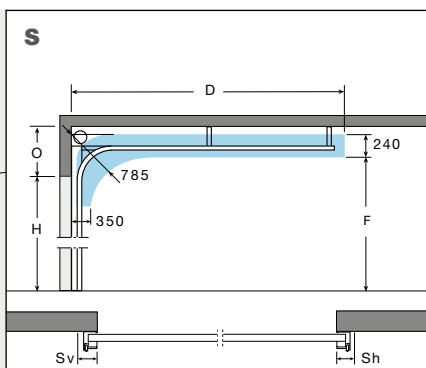
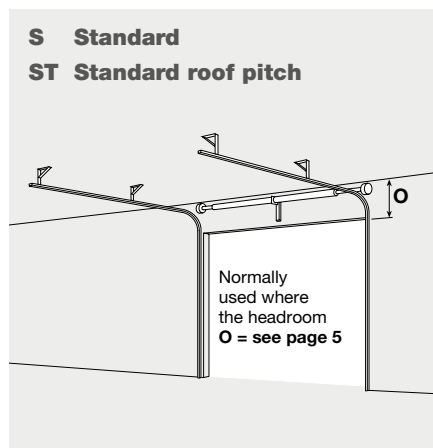
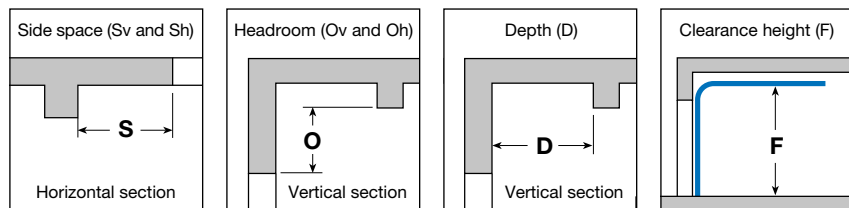
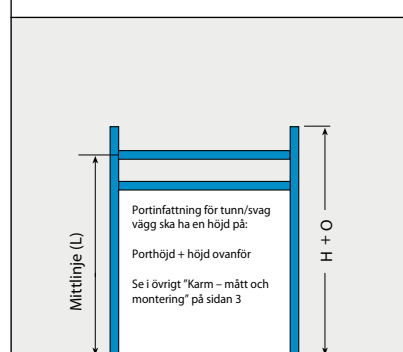


## Building conditions

- H:** Height, light admitting panel
- B:** Width, light admitting panel
- Ov / Oh:** Headroom left and right
- Sv / Sh:** side space left and right
- D:** Depth
- T:** Ceiling pitch
- A:** Stable area that can accept screws
- G:** Design of floor around door, see page 20
- L:** Floor to centre shaft

Headroom, side space and depth are calculated to the nearest obstacle.

## Reinforcement strut



The grey box around the rail system indicates the door's working area/necessary clearance. The measurements in the link indicate the size of this area in mm.  
If there any particular obstacles which the door must get past, you should draw a sketch and then Lindab will assess the options.

# Standard

## Rail system: S and ST

| Internal fitting dimensions |                                      |   | W x H ≤ 42 m <sup>2</sup> 2" set of rails   |
|-----------------------------|--------------------------------------|---|---|
| Standard ceiling            | Max. hole width                      | B | 8000 mm   |
|                             | Max. hole height                     | H | 9700 mm   |
|                             | Min. headroom                        | O | 0°-10°: 430 when: H ≤ 5500 mm, otherwise 520 mm<br>11-39°: 480 when: H ≤ 5500 mm, otherwise 560 mm  |
|                             | Min. headroom (Centerplaced motor)   | O | 0°-10°: 620 when: H ≤ 5500 mm, otherwise 670 mm<br>11-39°: 670 when: H ≤ 5500 mm, otherwise 710 mm  |
|                             | Min. side space along the rails      | S | 95 mm (75 mm for screws), cable break device 140 mm   |
|                             | Side space at shaft arrangement min. | S | 140/350 mm*   |
|                             | Min. depth                           | D | 0°-5°: H+950 mm (long spring door stops)**<br>5°-10°: H+1070 mm (long spring door stops)**<br>11°-39°: H+620 mm (short spring door stops) |
|                             | Roof pitch                           | T | 0°-39° (40°-45° ask technical dept.)  |
|                             | Clearance height                     | F | H+105 mm***   |
|                             | Floor to centre shaft                | L | 0°-10°: H+340 when H ≤ 5500 mm, otherwise H+380 mm.<br>11-39°: H+380 when H ≤ 5500 mm, otherwise H+420 mm.                                |

| Internal fitting dimensions |                                      |   | W x H > 42 m <sup>2</sup> reinforced 2" set of rails max. 850 kg                                   |
|-----------------------------|--------------------------------------|---|--|
| Standard ceiling            | Max. hole width                      | B | 8000 mm  |
|                             | Max. hole height                     | H | 9700 mm  |
|                             | Min. headroom                        | O | 3°: 760 when H ≤ 6000 mm<br>3°: 860 when H ≤ 8000 mm<br>3°: 950 when H ≤ 9700 mm<br>4°-10°: 600 mm |
|                             | Min. side space along the rails      | S | 95 mm (75 mm for screws), cable break device 140 mm  |
|                             | Side space at shaft arrangement min. | S | 250/450 mm****   |
|                             | Min. depth                           | D |  |
|                             | Roof pitch                           | T | 3°-10°   |
|                             | Clearance height                     | F | H+105 mm***  |
|                             | Floor to centre shaft                | L | H+500 mm   |

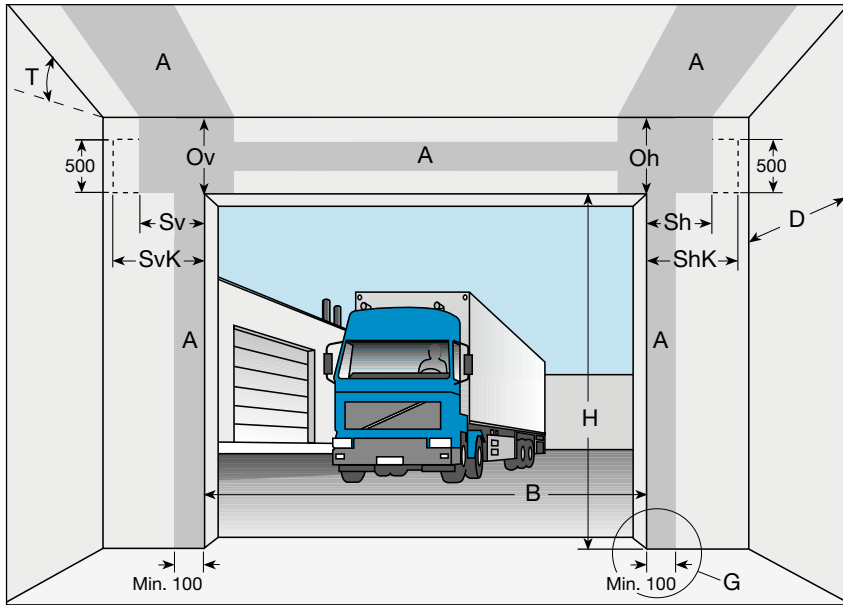
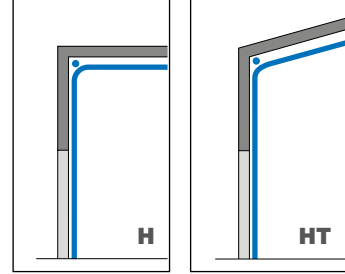
\*Externally located industrial motor. If there is room on the inner side of the drum, the requirement is 140/140 mm.

\*\*For manual doors, horizontal rails can be shortened to 450 mm by changing from long to short spring door stops – the door will no longer be ready for electrical operation.

\*\*\*Doors with wicket door sections with wind brace at the bottom section reduce the walk through height by up to 50 mm.

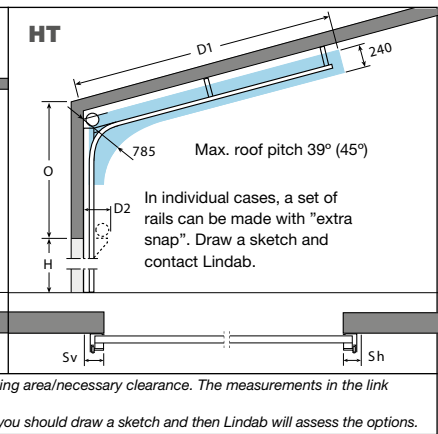
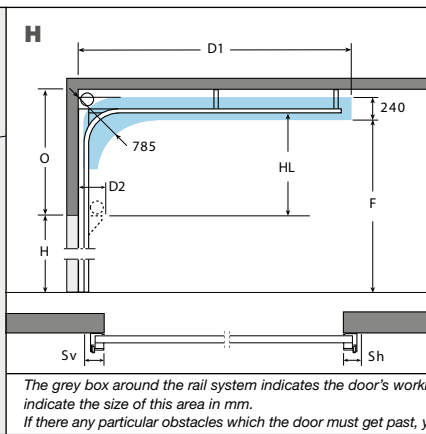
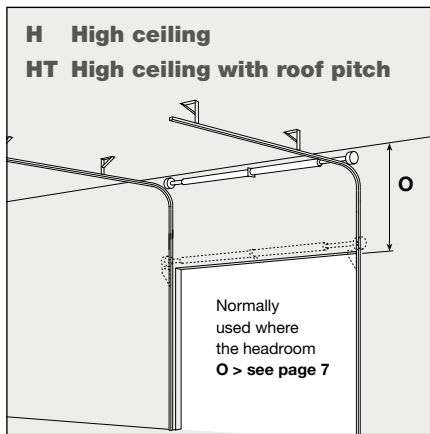
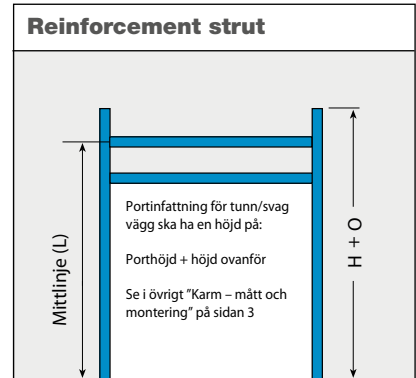
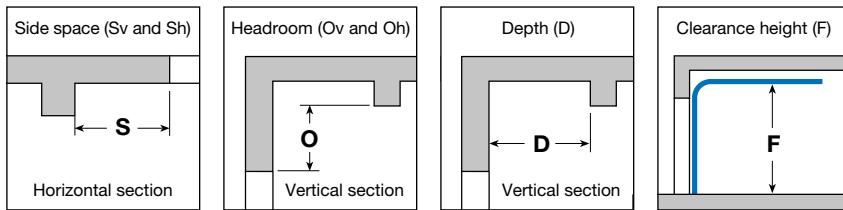
\*\*\*\*Externally located industrial motor. If there is room on the inner side of the drum, the requirement is 250/250 mm.

# High ceiling Rail system: H and HT



## Building conditions

- H:** Height, light admitting panel
  - B:** Width, light admitting panel
  - Ov / Oh:** Headroom left and right
  - Sv / Sh:** side space left and right
  - SvK / ShK:** Side space at bracket
  - D:** Depth
  - T:** Ceiling pitch
  - A:** Stable area that can accept screws
  - G:** Design of floor around door, see page 20
  - L:** Floor to centre shaft
- Headroom, side space and depth are calculated to the nearest obstacle.



The grey box around the rail system indicates the door's working area/necessary clearance. The measurements in the link indicate the size of this area in mm. If there any particular obstacles which the door must get past, you should draw a sketch and then Lindab will assess the options.

# High ceiling

## Rail system: H and HT

| Internal fitting dimensions |                                      |    | W x H ≤ 42 m <sup>2</sup> 2" set of rails   |
|-----------------------------|--------------------------------------|----|---|
| High ceiling                | Max. hole width                      | B  | 8000 mm   |
|                             | Max. hole height                     | H  | 6000 mm   |
|                             | Min. headroom                        | O  | 690 mm/4460 mm  |
|                             | High ceiling <sup>(5)</sup>          | HL | 0-360 mm (see illustration page 6)  |
|                             | Min. side space along the rails      | S  | 95 mm (75 mm for screws), cable break device 140 mm   |
|                             | Side space at shaft arrangement min. | S  | 140 mm/350 mm*  |
|                             | Min. depth                           | D  | H-O+1580 mm when 690 ≤ O ≤ 860 mm (long spring door stops)<br>H-O+1350 mm when O > 860 mm (short spring door stops) |
|                             | Roof pitch                           | T  | 0°-39° (40°-45°ask Lindab)  |
|                             | Clearance height                     | F  | H+O-465****   |
|                             | Floor to centre shaft                | L  | H+O-175 mm when O ≤ 3410 mm.<br>H+O-150 mm when O > 3410 mm   |

| Internal fitting dimensions |                                      |    | W x H > 42 m <sup>2</sup> reinforced 2" set of rails max. 850 kg |
|-----------------------------|--------------------------------------|----|--|
| High ceiling                | Max. hole width                      | B  | 8000 mm  |
|                             | hole height max.                     | H  | 6000 mm  |
|                             | Min. headroom                        | O  | 810 mm/4560 mm   |
|                             | High ceiling                         | HL | O-460 mm   |
|                             | Min. side space along the rails      | S  | 95 mm (75 mm for screws), cable break device 140 mm              |
|                             | Side space at shaft arrangement min. | S  | 250 mm/450 mm**  |
|                             | Min. depth                           | D  | H-O+1450 mm  |
|                             | Roof pitch                           | T  | 3°-10°   |
|                             | Clearance height                     | F  | H+O-565 mm****   |
|                             | Floor to centre shaft                | L  | H+O-250 mm   |

| Internal fitting dimensions |                                      |    | W x H ≤ 36 m <sup>2</sup> 2" set of rails - Springs on bracket                                     |
|-----------------------------|--------------------------------------|----|--|
| High ceiling                | Max. hole width                      | B  | 6000 mm  |
|                             | Max. hole height                     | H  | 6000 mm  |
|                             | Min. headroom                        | O  | 1860 mm/4460 mm when: W x H ≤ 25 m <sup>2</sup><br>2360 mm/4460 mm when: W x H > 25 m <sup>2</sup> |
|                             | High ceiling <sup>(5)</sup>          | HL | O-360 mm   |
|                             | Min. side space along the rails      | S  | 95 mm (75 mm for screws), cable break device 140 mm  |
|                             | Side space at shaft arrangement min. | S  | 200 mm/350 mm***   |
|                             | Min. depth                           | D  | H-O+1350 mm when O > 860 mm (short spring door stops)<br>At springs 650 mm                         |
|                             | Roof pitch                           | T  | 0°-39° (40°-45°ask Lindab)   |
|                             | Clearance height                     | F  | H+O-465 mm***  |
|                             | Floor to centre shaft                | L  | Approx. H+300 mm   |

\*Externally located industrial motor. If there is room on the inner side of the drum, the requirement is 140/140 mm

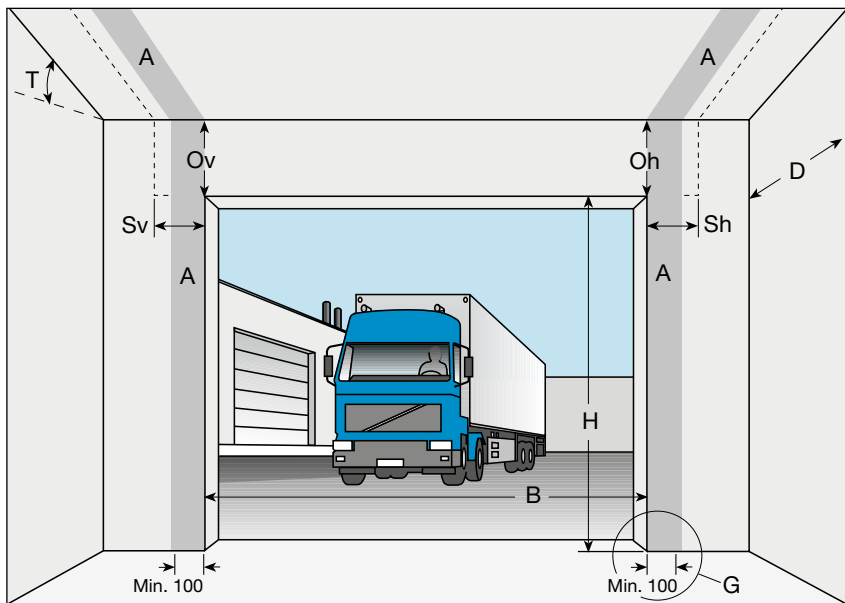
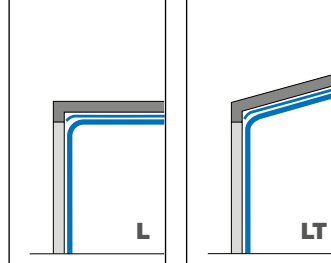
\*\*Externally located industrial motor. If there is room on the inner side of the drum, the requirement is 250/250 mm

\*\*\*Externally located industrial motor. If there is room on the inner side of the drum, the requirement is 200/200 mm

\*\*\*\*Doors with wicket door sections with wind brace at the bottom section reduce the walk through height by up to 50 mm.

(5) Centerplaced motor: HL = O - 480mm

# Low ceiling Rail system: L and LT

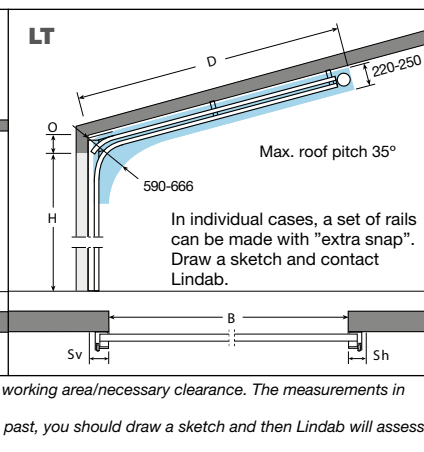
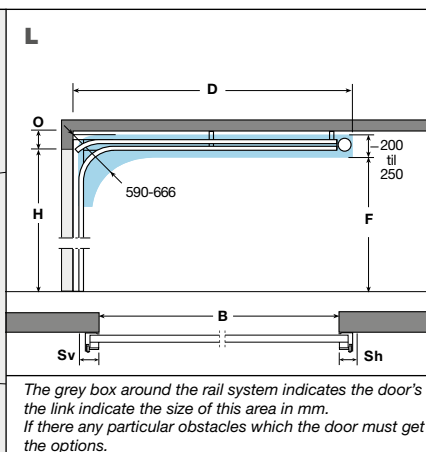
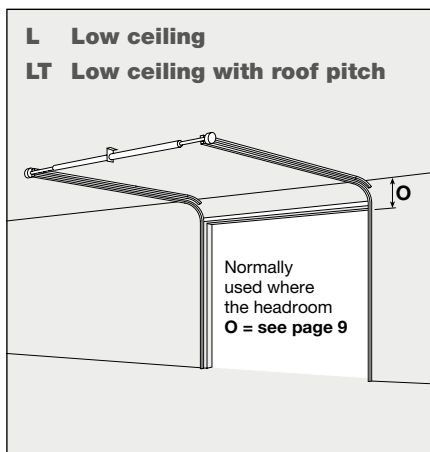
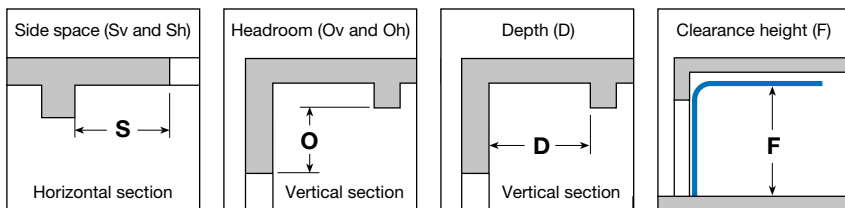
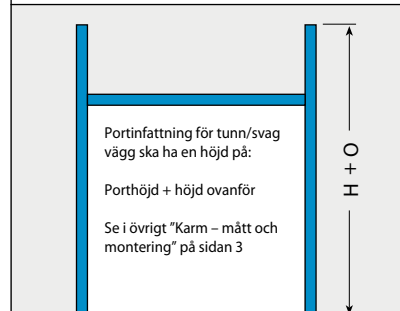


## Building conditions

- H:** Height, light admitting panel
- B:** Width, light admitting panel
- Ov / Oh:** Headroom left and right
- Sv / Sh:** side space left and right
- D:** Depth
- T:** Ceiling pitch
- A:** Stable area that can accept screws
- G:** Design of floor around door, see page 20
- L:** Floor to centre shaft

Headroom, side space and depth are calculated to the nearest obstacle.

## Reinforcement strut



The grey box around the rail system indicates the door's working area/necessary clearance. The measurements in the link indicate the size of this area in mm. If there any particular obstacles which the door must get past, you should draw a sketch and then Lindab will assess the options.



# Low ceiling

## Rail system: L and LT

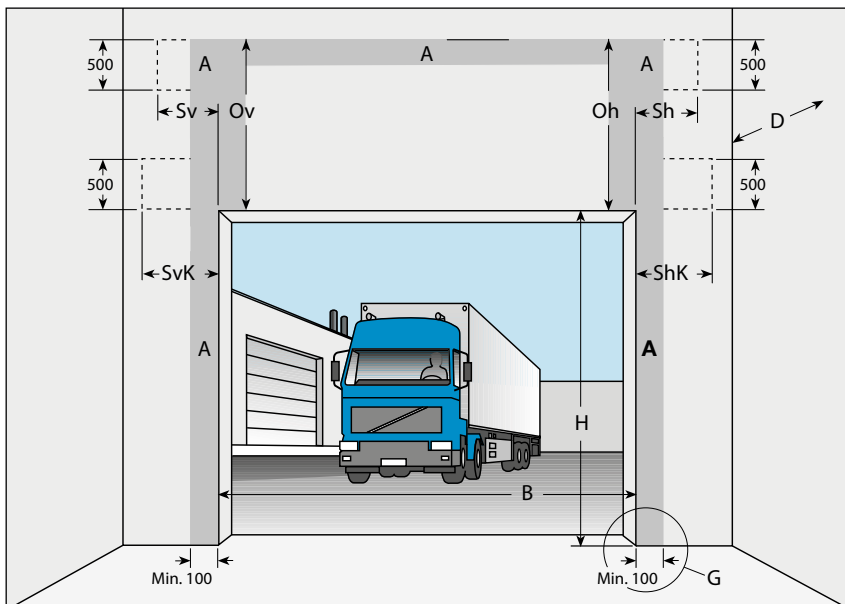
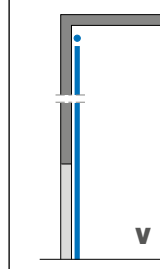
| Internal fitting dimensions |                                      | W x H ≤ 40 m <sup>2</sup> 2" set of rails |  |
|-----------------------------|--------------------------------------|---|--|
| Low ceiling                 | Max. hole width                      | B   | 8000 mm  |
|                             | Max. hole height                     | H   | 5500 mm  |
|                             | Min. headroom                        | O   | 200 mm when W < 6000 mm and W x H < 25 m <sup>2</sup> , otherwise 250 mm   |
|                             | Min. side space along the rails      | S   | 105 mm (without photocells the requirement is 95)<br>(75 mm for screws)  |
|                             | Side space at shaft arrangement min. | S   | 180 mm/350 mm*   |
|                             | Min. depth                           | D   | 0°-10°: H+1250 mm when W < 6000 and W x H < 25 m <sup>2</sup> ,<br>otherwise H+1350 mm (long spring door stops)**<br>11°-35°: H+800 mm when W < 6000 and W x H < 25 m <sup>2</sup> ,<br>otherwise H+900 mm (short spring door stops) |
|                             | Roof pitch                           | T   | 0°-35°   |
|                             | Clearance height                     | F   | H-80 mm under motor, otherwise free clearance height***  |
|                             |                                      |   |  |

\*Externally located motor. If there is room on the inner side of the drum the requirement is 180/180 mm, however the required room depth will increase by +250 mm (motor is reversed).

\*\*For manual doors, horizontal rails can be shortened to 450 mm by changing from long to short spring door stops – the door will no longer be ready for electrical operation.

\*\*\*Doors with wicket door sections with wind brace at the bottom section reduce the walk through height by up to 80 mm.

# Vertical ceiling Rail system: V

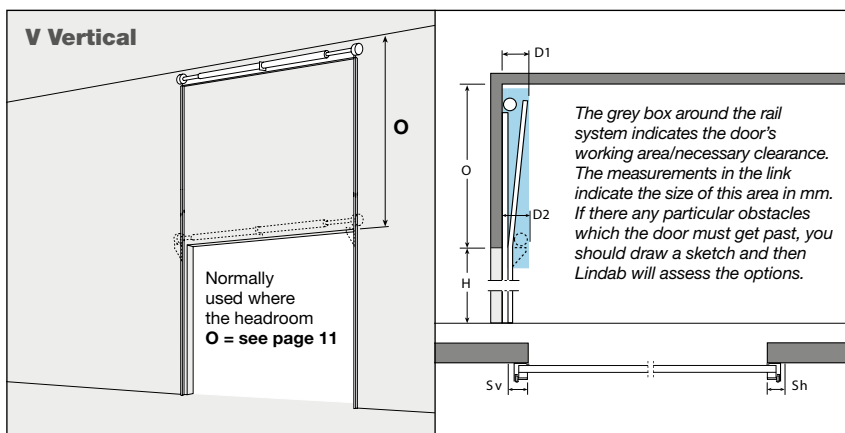
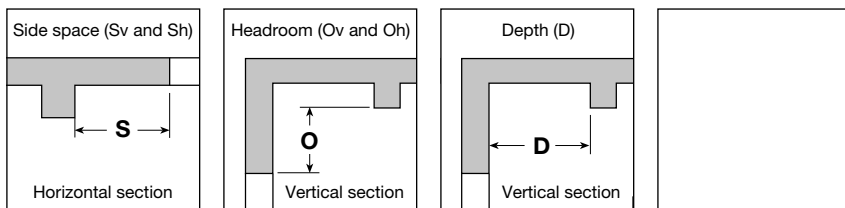
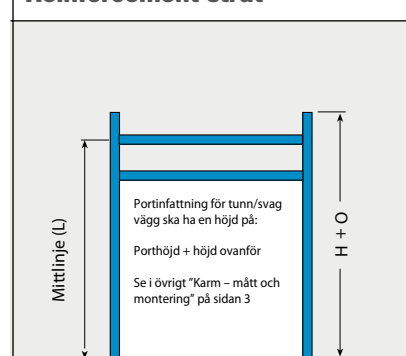


## Building conditions

- H:** Height, light admitting panel
- B:** Width, light admitting panel
- Ov / Oh:** Headroom left and right
- Sv / Sh:** side space left and right
- D:** Depth
- T:** Ceiling pitch
- A:** Stable area that can accept screws
- G:** Design of floor around door, see page 20
- L:** Floor to centre shaft

Headroom, side space and depth are calculated to the nearest obstacle.

## Reinforcement strut



# Vertical ceiling Rail system: V

| Internal fitting dimensions |                                       | W x H ≤ 42 m <sup>2</sup> 2" set of rails                        |   |
|-----------------------------|---------------------------------------|--|---|
| Vertical ceiling            | Max. hole width                       | B  | 8000 mm   |
|                             | Max. hole height                      | H  | 8400 mm   |
|                             | Min. headroom                         | O  | H+320 mm when H ≤ 5500 mm, otherwise H+375 mm   |
|                             | Min. headroom<br>(Centerplaced motor) | O  | H+430 mm when H ≤ 5500 mm, otherwise H+485 mm   |
|                             | Min. side space along the rails       | S  | 95 mm (75 mm for screws), cable break device 140 mm                                       |
|                             | Side space at shaft arrangement min.  | S  | 140 mm/350 mm*  |
|                             | Min. depth                            | D  | 730 mm measured at springs when H = 8400 mm   |
|                             | Floor to centre shaft                 | L  | 2xH+220 mm when H ≤ 3300 mm<br>2xH+260 mm when H ≤ 5500 mm<br>2xH+300 mm when H < 8400 mm |
| Internal fitting dimensions |                                       | W x H > 42 m <sup>2</sup> reinforced 2" set of rails max. 850 kg |   |
| Vertical ceiling            | Max. hole width                       | B  | 8000 mm   |
|                             | Max. hole height                      | H  | 8400 mm   |
|                             | Min. headroom                         | O  | H+375 mm  |
|                             | Min. side space along the rails       | S  | 95 mm (75 mm for screws), cable break device 140 mm                                       |
|                             | Side space at shaft arrangement min.  | S  | 250 mm/450 mm**   |
|                             | Min. depth                            | D  | 730 mm measured at springs when H = 8400 mm   |
|                             | Floor to centre shaft                 | L  | 2xH+300 mm  |

| Internal fitting dimensions |                                      | W x H ≤ 36 m <sup>2</sup> 2" set of rails - Springs on bracket |   |
|-----------------------------|--------------------------------------|--|---|
| Vertical ceiling            | Max. hole width                      | B  | 6000 mm   |
|                             | Max. hole height                     | H  | 6000 mm   |
|                             | Min. hole height                     | H  | 2400 mm****   |
|                             | Min. headroom                        | O  | H+340 mm  |
|                             | Min. side space along the rails      | S  | 95 mm (75 mm for screws), cable break device 140 mm |
|                             | Side space at shaft arrangement min. | S  | 200 mm/350 mm**                                     |
|                             | Min. depth                           | D  | 580 mm at ceiling, 650 mm at springs                |
|                             | Floor to centre shaft                | L  | Approx. H+300 mm                                    |

\*Externally located industrial motor. If there is room on the inner side of the drum, the requirement is 140/140 mm

\*\*Externally located industrial motor. If there is room on the inner side of the drum, the requirement is 250/250 mm

\*\*\*Externally located industrial motor. If there is room on the inner side of the drum, the requirement is 200/200 mm

\*\*\*\*For safety reasons there is a min. height of 2400 mm, if the bracket is placed further down there is a risk of getting fingers trapped in the wiring or drum

# Door panels

## Main components

1. Door section (LDI or LDP, see p.12)
2. Window (several types, see p.14)
3. Window or filling (see p.13)
4. Built-in wicket door (see p.16-17)
5. Handle (Internal/ext.)
6. Track roller\*
7. Barrel bolt (standard locking system)
8. Bottom bracket\* (with cable break device as option)
9. Side hinge\*
10. Top bracket\*
11. Centre hinge\*
12. Wind reinforcement
13. Ventilation grille (various sizes)
14. Rubber seals along all the edges (see page 15)

\*) Available in stainless steel

## Materials

### LDI - insulated sections

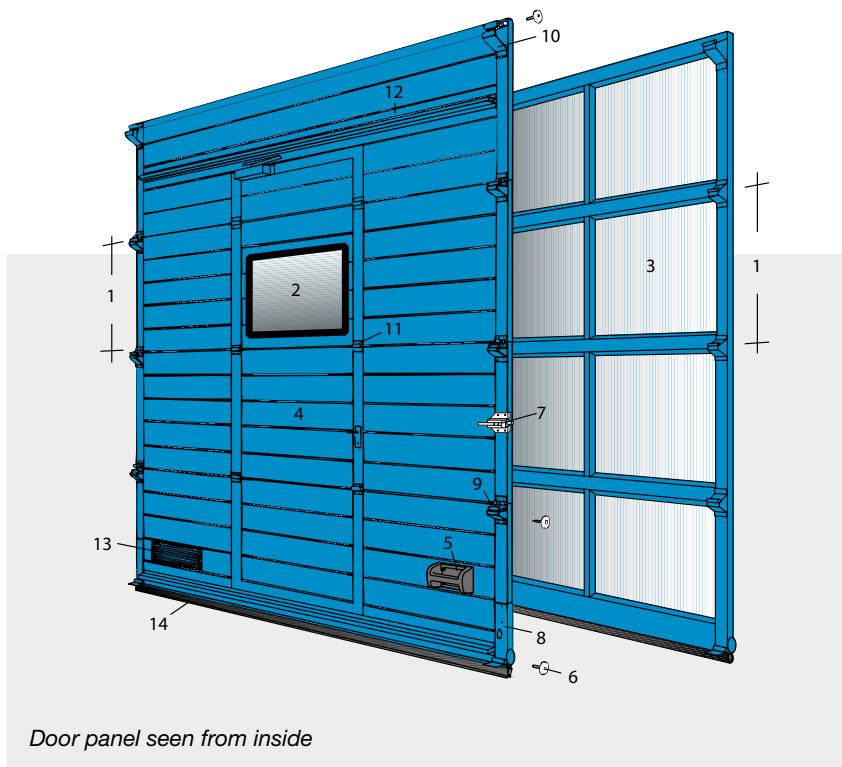
LDI sections have an extruded polystyrene core - a strong, highly insulating and environmentally friendly material which also effectively prevents bursting due to frost, as the water absorbency of polystyrene is only 0.5%. The polystyrene core is laminated with aluminium-stucco (a hard type of aluminium sheet with a slight relief effect) or steel-stucco sheet with a 25 mu polyester coated surface (the surface treatment fulfils corrosion resistance class 3 requirements). The solution with steel-stucco sheet is always recommended when there is a need for a surface strong enough to resist knocks and bumps.

### LDP - Panorama sections

The frame profiles of the LDP sections are manufactured from extruded, anodised aluminium profiles with a great deal of strength and a high level of finish. Windows and fillings, see page 14.

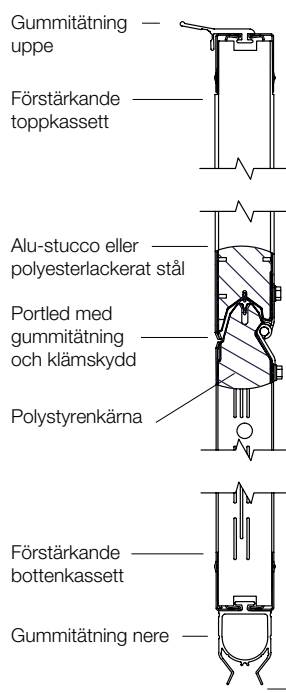
## Colours and coatings

LDI sections with aluminium-stucco sheet can be chosen as untreated, treated with one of the many pre-lacquered standard colours or specially lacquered. For LDI sections with polyester lacquered steel, one of the many standard colours

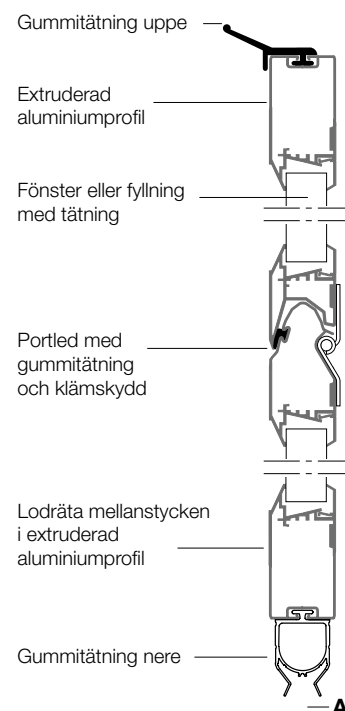


Door panel seen from inside

### LDI - vertical section



### LDP - vertical section



can be selected or a special lacquer can be ordered on request.

LDP panorama sections are often supplied anodised in their natural colour, but can also be ordered with a special lacquer of one's own choosing. Top and bottom cassettes, fillings, door cassettes, ventilation grilles etc. can

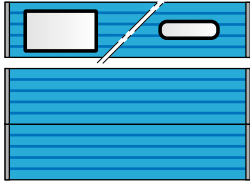
also, for a surcharge, be supplied with a specially requested lacquer.

A colour chart of the various polyester and aluminium pre-lacquered colours can be ordered. Note: Slight differences in shades between wet and pre-lacquered surfaces may occur.

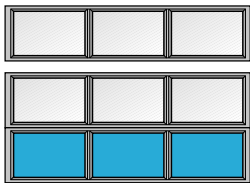
# Construction, door panel

## Types of door panel and construction

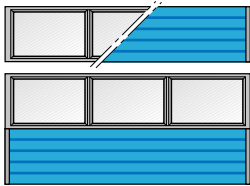
The door panel is made up of horizontally aligned sections with a length corresponding to the width of the door aperture + side overlap.



**LDI**



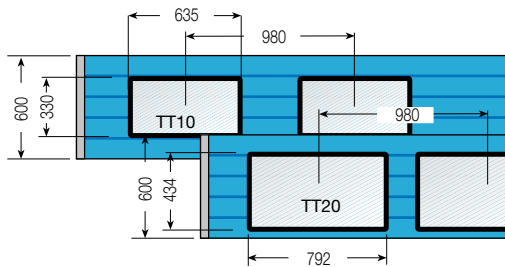
**LDP**



**LDC (LDI + LDP)**

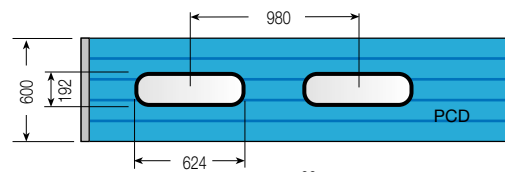
### LDI door section window TT10/TT20

The window measurements are from the outside frame



### LDI door section window PCD

The window measurements are from the outside frame



### LDC door section Fullvision

Frame section with one pane  
Max. width 5 metres

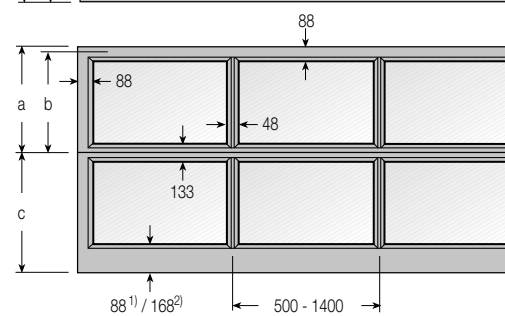


### LDP door sections

- a. Top section: 270 - 869
- b. Middle section: 300 - 800
- c. Bottom section\*: 420 - 900  
\*incl. rubber base

(A section height of 600 mm is recommended)

30 mm overlap at top  
25 mm overlap on either side



1) With hole widths  $\leq$  4100    2) With hole widths  $>$  4100    Both measurements are excl. rubber base

## LDI

The LDI type of door panel is made up of insulating sections that are 46 mm thick and 600 mm high.

Optimal insulation is achieved with the least amount of sections (door panels). This makes them the ideal door heights for the LDI type, as this table shows:

| Optimal door height - LDI |                            |
|---------------------------|----------------------------|
| Number of sections        | Door aperture height in mm |
| 4                         | 2450                       |
| 5                         | 3050                       |
| 6                         | 3650                       |
| 7                         | 4250                       |
| 8                         | 4850                       |
| 9                         | 5450                       |
| 10                        | 6050                       |
| 11                        | 6655                       |
| 12                        | 7250                       |

Page 14 shows the different types of window that can be built into the LDI sections.

## LDP

The LDP type of door panel is made up of panorama sections. The sections can be manufactured in individual heights. The flexible section height makes it possible to manufacture a door panel where all the sections are the same height, regardless of the height of the door aperture.

The vertical field divisions of the panorama sections are also variable. Panorama frames are filled with the window types and fillings shown on page 14.

## LDC

LDI and LDP sections can be freely combined to create the LDC type of door panel.

LDC doors are always supplied with an LDI type bottom section.

| Max. hole width   |          |
|---|----------|
| LDI   | 8000 mm  |
| LDP   | 6000 mm  |
| LDC   | 8000 mm* |
| * For hole widths 7501-8000 mm:<br>max. 2 LDP sections and<br>bracket types H, HT and V only. |          |

# Windows and fillings

## LDI

If windows are wished for in insulating sections, they will be positioned as standard in the centre around the section's centre shaft and with one window per whole metre. The windows are positioned from the middle of the section and symmetrically out to the sides.

Window types TT10, TT20 and PCD are produced with a solid plastic frame that is screwed together.

## LDP

Panorama sections can be produced with any size of window and filling, within the limits indicated on page 16. As standard, panorama sections will be produced with the number/division of windows or fillings given in the following table:

| Number of horizontal sections - LDP/LDC |                   |
|---|-------------------|
| Width of door aperture                  | Min. and standard |
| 0-1400                                  | 1                 |
| 1401-2800                               | 2                 |
| 2801-4000                               | 3                 |
| 4001-5400                               | 4                 |
| 5401-6000                               | 5                 |
| 6001-6800*                              | 5                 |
| 6801-8000*                              | 6**               |

\*) LDC doors only

\*\*) See table at the bottom of page 18

Windows/fillings are mounted in LDP sections with elastic butyl tape.

**Note:** If a wicket door is ordered in the door, the wicket door has an influence on the number and positioning of the windows, see pages 16-17.

| Approx. weight per m <sup>2</sup> LDI door panel |         |
|--|---------|
| LDI with aluminium stucco                        | 9.0 kg  |
| LDI with steel/polyester                         | 14.0 kg |

| Types of window pane  | LDI   |                        |                        | LDC/LDP                    |   |
|---|---|------------------------|------------------------|----------------------------|---|
|   | TT20  | TT10                   | PCD                    | LDP sect.                  |   |
| Type:   |   |                        |                        |                            |   |
| Light measurement, mm:  | 708 × 350   | 551 × 246              | 570 × 135              | Variable see page 10       |   |
| Light area, m <sup>2</sup> :  | 0.25  | 0.14                   | 0.08                   |                            |   |
| Total U-value, double glazed pane, W/m <sup>2</sup> K   | 2.62  | 2.13                   | 1.85                   | See types of window pane   |   |
| Total U-value, triple glazed pane, W/m <sup>2</sup> K   | 2.21  | 1.89                   | -                      |                            |   |
| Design:   | Plastic frame, screwed  | Plastic frame, screwed | Plastic frame, screwed | Extruded aluminium profile |   |
| <p><b>SAN</b> (2 sides)<br/>28 mm ACRYL Thermo</p> <p>U-value for the SAN type of window pane alone:</p> <p>Double glazed pane: 2.8 W/m<sup>2</sup>K</p> <p>Triple glazed pane: 1.94 W/m<sup>2</sup>K</p> | Double glazing  | ●                      | ●                      | ●                          |   |
|   | Triple glazing  | ●                      | ●                      | ●                          |   |
|   | <b>HD</b> (2 sides)<br>28 mm HARD<br>Scratch and chemical resistant<br>Car washes | Double glazing         | ●                      | ○                          | ● |
|   |   | Triple glazing         | ○                      | ○                          | ● |
|   | Double glazed pane: 2.8 W/m <sup>2</sup> K  | Double glazing         | ●                      | ○                          | ● |
|   |   | Triple glazing         | ○                      | ○                          | ● |
|   | Triple glazed pane: 1.94 W/m <sup>2</sup> K                                       | Double glazing         | ●                      | ○                          | ● |
|   |   | Triple glazing         | ○                      | ○                          | ● |
|   | <b>GP</b> (1 side)<br>28 mm GEPERLT<br>Granulated surface                         | Double glazing         | ●                      | ○                          | ● |
|   |   | Triple glazing         | ○                      | ○                          | ● |
| <b>GR</b> (2 sided)<br>28 mm Grey<br>Grey tone  | Double glazing  | ●                      | ○                      | ●                          |   |
|   | Triple glazing  | ○                      | ○                      | ●                          |   |
| <b>PC</b> (1 side)<br>28 mm<br>POLYCARBONATE<br>Burglary proof  | Double glazing  | ●                      | ○                      | ●                          |   |
|   | Triple glazing  | ○                      | ○                      | ●                          |   |
| <p><b>DE3</b><br/>3 mm single acrylic</p> <p>U-value for the DE3 type of window pane alone: 5.2 W/m<sup>2</sup>K</p>  |   |                        |                        | ●                          |   |
|   |   |                        |                        |                            | ● |
| <p><b>DE4H</b><br/>4 mm hardened glass</p> <p>U-value for the DE4H type of window pane alone: 6.0 W/m<sup>2</sup>K</p>  |   |                        |                        | ●                          |   |
|   |   |                        |                        |                            | ● |
| <p><b>Filling</b><br/>28 mm polystyrene with aluminium or steel stucco surface</p> <p>U-value for the filling alone: 1.3 W/m<sup>2</sup>K</p>   |   |                        |                        | ●                          |   |
|   |   |                        |                        |                            | ● |
| <p><b>STP1</b><br/>Perforated steel plate<br/>Hole size: □ 9.5 mm<br/>Air access: 50.8%</p>   |   |                        |                        | ●                          |   |
|   |   |                        |                        |                            | ● |
| <p><b>STP2</b><br/>Perforated steel plate<br/>Hole size: Ø 5.30 mm<br/>Air access: 40.0%</p>  |   |                        |                        | ●                          |   |

● Normal stock ○ Made to order

### Examples of estimated U-values for doors

**LDI** 4 × 4 m door without panes - Steel: U = 1.2 W/m<sup>2</sup>K.

#### More combinations:

**LDP** with panes and fillings:

U = Contact Lindab

**LDC** with panes:

U = Contact Lindab

# Tightness, heat insulation and safety



**Top seal**

A large and elastic rubber lip is mounted at the top of the door panel where it pushes against the wall to ensure an efficient seal.

**Intermediate seal**

The special design of the door joint, together with the integrated and safely anchored rubber seal, makes the joint between the sections completely airtight.

**Bottom seal**

The door panel is also equipped with a robust, flexible rubber seal at floor level. The rubber seal is designed to effectively prevent draughts along the floor.

**Side seal**

The side seal is mounted onto the door frame and is designed in such a way that the rubber seal presses tightly against the door panel when the door is closed.

Standard side seal

Standard side seal incl. thermal break

## Tightness

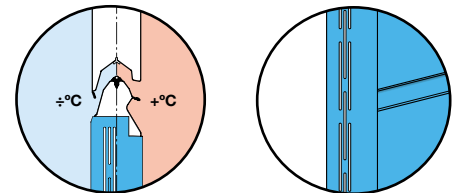
Flexible, tightly-fitting rubber seals in door joints and impact panels ensure optimum sealing against the wind and thereby effective protection against irritating draughts.

The rubber seals are made of 100% EPDM rubber, which maintains its elasticity in temperatures ranging from +60°C to -40°C.

## Heat insulation

The insulating LDI sections have an insulating capacity that is almost double as effective as a corresponding thickness of stone wool. (U-value of the LDI panel: approx. 0.6 W/m<sup>2</sup>K). Naturally enough, the number of windows has an influence on the door panel's total insulating capacity.

For panorama doors, it is primarily the type of window/filling that determines the heat insulation of the door.



## Safety

All Lindab Doorline doors are CE-marked and comply with EN 12453 and EN 13241-1 requirements for electrically operated doors.

The patented panel joints (Finger Protection) effectively prevents fingers from being caught and crushed in the door joints. Further protection is provided against fingers becoming caught in the door rollers, as these are mounted on safety discs.

Accessories can also be supplied for Lindab Doorline in the form of a spring break device\*\* and cable break device, so that the door has additional safety features built into these areas as well.

\*\*) Spring break safety devices are an EN 13241-1 requirement for manually operated doors and electrically operated doors that can be disconnected for manual operation.

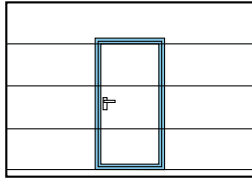
| Lindab Doorline - application in relation to current standards |                     |                |                        |  |
|--|---------------------|----------------|------------------------|--|
| Standard   | Designation         | Standard class | Test result            | Remarks  |
| EN 12424 / 12444   | Wind load           | 0 - 4          | Class 3*               | Normal use must be a minimum of class 3 (25 m/s) |
| EN 12425 / 12489   | Water penetration   | 0 - 3          | Class 3                | Normal use must be a minimum of class 2          |
| EN 12426 / 12427   | Air permeation      | 0 - 5          | Class 3                | Normal use must be class 2-4                     |
| EN 12428   | Insulating capacity | Defined value  | 1.2 W/m <sup>2</sup> K | LDI, 4.0 x 4.0 m door without doors or windows   |

\*) A higher wind class can be achieved; enquire with Lindab.

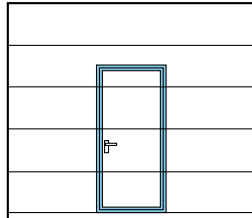
**Finger protection at door joints and door rollers**

# Wicket door integrated into door

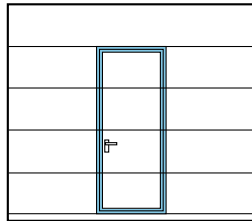
## Types of wicket door



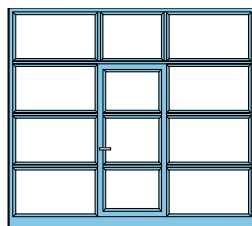
D31



D35



D40



D30

## Wicket door data

| Door type                               | Wicket door type | Min. / Max. Width of door aperture, mm | Min. Height of door aperture, mm | Remarks                                |                                    |
|---|------------------|--|----------------------------------|--|------------------------------------|
| <b>LDI</b>                              | <b>D31</b>       | 1600-3500                              | 2150                             | Hole height < 2300 mm                  |                                    |
|   | <b>D35</b>       | 1600-5000                              | 2300*                            | Standard ( <b>recommended</b> )        |                                    |
|   | <b>D40</b>       | 1600-5000                              | 2565**                           | Alternative                            |                                    |
| <b>LDP</b>                              | <b>D40</b>       | 2200-5000                              | 2000**                           | Standard                               |                                    |
|   | <b>D30</b>       | 2200-5000                              | 2000**                           | Alternative on high sections           |                                    |
| <b>LDC</b>                              | <b>D31</b>       | 2200-3500                              | 2150                             | Not possible with panes in 4th section |                                    |
|   | <b>D35</b>       | 2200-5000                              | 2300*                            | Not possible with panes in 4th section |                                    |
|   | <b>D40</b>       | 2200-5000                              | 2565**                           | Standard                               |                                    |
| Width of door aperture ***<br>> 5000 mm | <b>LDI</b>       | <b>D35</b>                             | 5001-5500                        | 2500*                                  | Not with rail system L or LT       |
|   |                  | <b>D35</b>                             | 5501-6000                        | 2500*                                  | Only with rail systems H, HT and V |
|   | <b>LDC</b>       | <b>D40</b>                             | 5001-5500                        | 2565**                                 | Not with rail system L or LT       |
|   |                  | <b>D40</b>                             | 5501-6000                        | 2565**                                 | Only with rail systems H, HT and V |
|   | <b>LDP</b>       | <b>D30/D40</b>                         | 5001-5500                        | 2500**                                 | Not with rail system L or LT       |
|   |                  | <b>D30/D40</b>                         | 5501-6000                        | 2500**                                 | Only with rail systems H, HT and V |

\* For hole widths > 3500 mm the door height must be a minimum of 2500 mm

\*\* For hole widths > 3500 mm the door must be a minimum of one section higher than the wicket door.

\*\*\* Doors with wicket doors can be made wider than 5000 mm if the wicket door is used max. 2-3 times daily. Be aware of the wind load and choice of rail system.

In order to achieve an optimal solution, panorama sections in the built-in door must be a maximum of 700 mm high.

The free passage width of the wicket door is 910 mm (excl. protruding door handle, 65 mm).

The wicket door has a bottom step with a height of 170 mm.

The door can be supplied as left or right-handed, and always opens outwards.

As standard, the door will be supplied with lock case, cylinder (drop-shaped), handle and door closer. The door can be supplied with other equipment upon request.

## LDI doors - Door placement and windows per section

| Width of door aperture mm | Field |   |   |   |   | Max. number of windows per section |
|---------------------------|-------|---|---|---|---|------------------------------------|
|                           | 1     | 2 | 3 | 4 | 5 |                                    |
| 1600-1959                 |       |   |   |   |   | 1                                  |
| 1960-2939                 |       |   |   |   |   | 2                                  |
| 2940-3919                 |       |   |   |   |   | 3                                  |
| 3920-4899                 |       |   |   |   |   | 4                                  |
| 4900-6000                 |       |   |   |   |   | 5                                  |

With one window per section, this is always placed inside the wicket door.

When more windows are to be placed, this is always done symmetrically in relation to the door's centre line.

## LDP and LDC doors - Door placement and windows per section

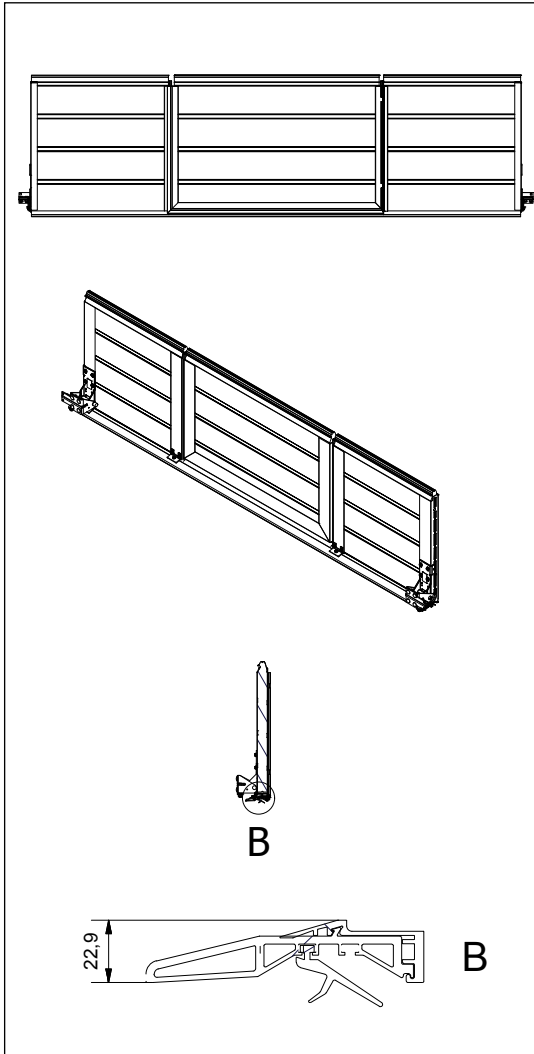
| Width of door aperture mm | Field |   |   |   |   | Max. number of windows per section |
|---------------------------|-------|---|---|---|---|------------------------------------|
|                           | 1     | 2 | 3 | 4 | 5 |                                    |
| 2200-3750                 |       |   |   |   |   | 3                                  |
| 3751-4500                 |       |   |   |   |   | 4                                  |
| 4501-6000                 |       |   |   |   |   | 5                                  |

## Placement of wicket door in door panel

As the drawings on the right show, the placement options available for the door depend on the width of the door aperture and thus the number of fields which the door panel can be divided up into.



# Wicket door in door - low bottom piece



| Wicket door data   |                  |                                |                          |  |                                    |
|--|------------------|--------------------------------|--------------------------|--|------------------------------------|
| Door type  | Wicket door type | Min. / Max. aperture width, mm | Min. aperture height, mm | Remarks                                |                                    |
| <b>LDI</b>   | <b>D31</b>       | 3000-3500                      | 3000                     | Hole height < 2300 mm                  |                                    |
|  | <b>D35</b>       | 3000-5500                      | 3000                     | Standard ( <b>recommended</b> )        |                                    |
|  | <b>D40*</b>      | 3000-5500                      | 3000                     | Alternative ( <b>recommended</b> )     |                                    |
| <b>LDC</b>   | <b>D31</b>       | 2200-3500                      | 3000                     | Not possible with panes in 4th section |                                    |
|  | <b>D35</b>       | 2200-5500                      | 3000                     | Not possible with panes in 4th section |                                    |
|  | <b>D40</b>       | 2200-5500                      | 3000                     | Standard                               |                                    |
| Width of door aperture $\wedge$ 5500 mm                  | <b>LDI</b>       | <b>D35</b>                     | 5501-6000                | 3000                                   | Only with rail systems H, HT and V |
|  | <b>LDC</b>       | <b>D40*</b>                    | 5501-6000                | 3000                                   | Only with rail systems H, HT and V |
|  |                  |                                |                          |  |                                    |
| * Choose a D35 if possible, D40 weakens the construction |                  |                                |                          |  |                                    |

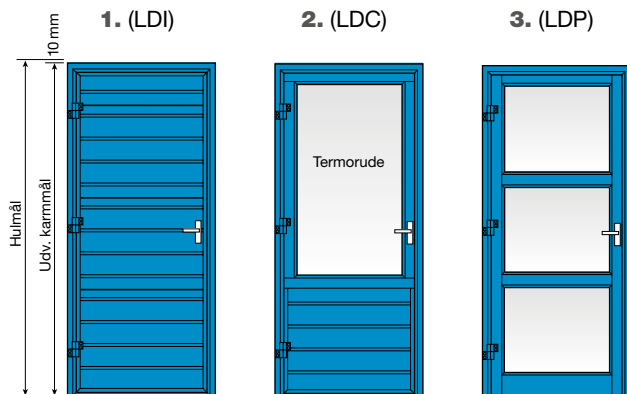
| LDI and LDC doors - Door placement and windows per section |       |   |   |   |   |                                    |
|--|-------|---|---|---|---|------------------------------------|
| Width of door aperture, mm                                 | Field |   |   |   |   | Max. number of windows per section |
|  | 1     | 2 | 3 | 4 | 5 |                                    |
| 3000-3919  |       |   |   |   |   | 3                                  |
| 3920-4899  |       |   |   |   |   | 4                                  |
| 4900-6000  |       |   |   |   |   | 5                                  |

With one window per section, this is always placed inside the wicket door.  
When more windows are to be placed, this is always done symmetrically in relation to the door's centre line.

| Data and requirements for integrated fittings |   |  |
|---|---|--|
| <b>Min. hole width:</b>                       | 3000 mm   |  |
| <b>Max. hole width:</b>                       | 5500 mm (S, ST) Max. width: 6000 mm (H, HT, V)  |  |
| <b>Min. height:</b>                           | 3000 mm (due to light barrier) w/electrical operation - manual as for normal wicket doors.  |  |
| <b>Bracket types:</b>                         | S, ST, H, HT, V, L, LT  |  |
| <b>Door panel:</b>                            | LDI, LDC  |  |
| <b>Height of bottom piece:</b>                | 22.9 mm   |  |
| <b>Cable break device:</b>                    | Optional  |  |
| <b>Floor:</b>                                 | The level of the floor may not deviate by more than $\pm 3$ mm over a length of 4 metres (from door aperture and 300 mm inside the building). |  |
| <b>Safety:</b>                                | Finger protection, Safety light barrier in the doorway for the first 2580 mm. The safety light barrier is NOT optional.                       |  |
| <b>Accessibility:</b>                         |   |  |
| <b>Subject:</b>                               | Fulfil:   | Description:                                       |
| <b>Free passage width:</b>                    | Quality class B   | Corresponds to a minimum 870 mm aperture           |
| <b>Height of door step:</b>                   | Quality class C   | Bottom piece max. 25 mm                            |
| <b>Opening force:</b>                         | Quality class C   | Opening force, which ensures accessibility for all |

# Facade doors

## Facade doors - types



1. Door constructed from LDI sections.  
Window types: see the table on page 14.
2. Door constructed from LDI and LDP sections.  
Normally manufactured with double glazing.  
The door can also be manufactured with 2 LDI sections.
3. Door constructed from LDP sections.  
Can be manufactured with all types of windows and fillings compatible with LDP sections.
4. Facade doors are intended for use in buildings that are not heated, or only for short periods, to over 5° Celsius

Facade doors are supplied in a finished state with frame, lock case, cylinder, handle and door closer - custom made for the door aperture.

Make sure the width of the door does not exceed:  $\frac{\text{Door height}}{1.9}$

However max.: w × h: 1210 × 2400 mm.  
There is an option of two-leaf doors, max.: w × h: 2500 × 2400 mm.

### LDI - insulated sections

LDI sections have a core of extruded polystyrene coated with an aluminium or steel stucco sheet.

#### LDI - facade doors Min. hole width for pane type

|                |
|----------------|
| TT20 = 1080 mm |
| TT10 = 955 mm  |
| PCD = 905 mm   |

### LDP - panorama sections

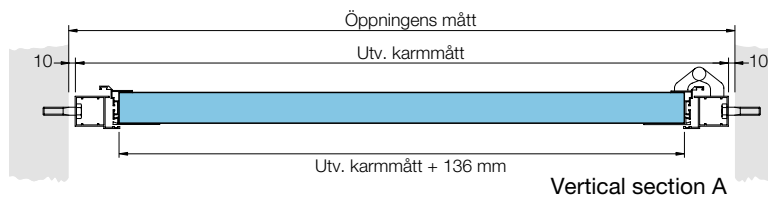
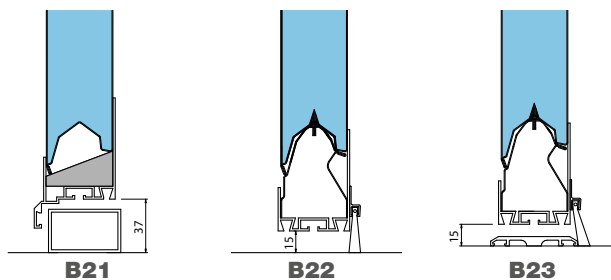
Door sections built up of extruded and anodised aluminium profiles.

### LDC

Choose your own combination of insulating sections and panorama sections.

## Facade doors: Bottom and side details

Vertical section



### Vertical section

For facade doors, you can choose between the three bottom fittings shown. It is also recommended that facade doors always open outwards, and that a slope be established on the floor as with the overhead doors.

#### B21

Standard bottom fitting with 50 × 30 mm anodised aluminium profile as impact panel.

#### B22

Bottom impact panel with 25 mm brush seal.

#### B23

Bottom impact panel with 25 mm brush seal and floor profile in anodised aluminium.

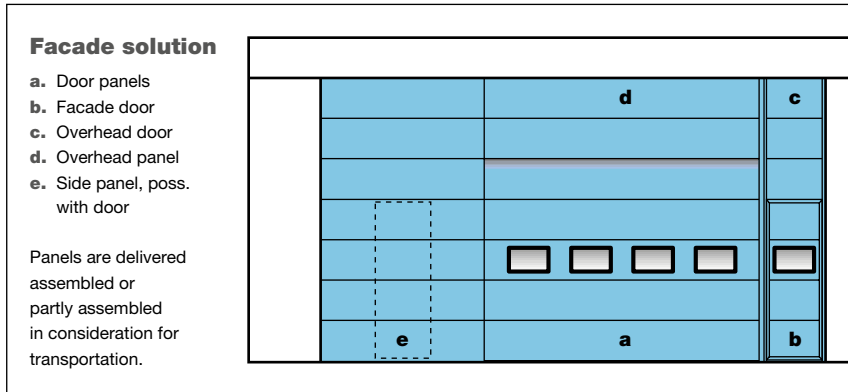
### Horizontal section

The facade door is mounted into prefabricated holes in the door aperture (see horizontal section A) or with mounting angles (see horizontal section B).

# Facade solution and colour scheme

It is always best to separate pedestrian and vehicular traffic. It is therefore recommended, if at all possible, to position the access door at the side of the door panel, e.g. mounted in a fixed side panel.

Lindab Profil A/S can supply facade doors and side panels so that the solution matches the door panel in design and materials as well as colour. Facade doors and side panels can also be supplied with the same type of windows as those used in the door panel.



Similarly, the door aperture can be supplied with a fixed overhead panel made up of Lindab Doorline door elements. The corresponding side panels will also help to create a unified whole together with the door panel.

Side panels and overhead panels are well-functioning architectural options in new builds, but are also used in renovations where, for example, a large door aperture needs making smaller.

Lindab Doorline door elements are also well-suited to interior room division, e.g. storeroom sections, site manager's office etc.

| Colour scheme - standard colours doors |                                   |   |         | Note: RAL no. indicates approximate colour |                   |         |            |
|--|-----------------------------------|---|---------|--|-------------------|---------|------------|
| Colour                                 | Colour value<br>≥ 7 = dark colour | Aluminium   |         |  | Steel - Polyester |         |            |
|  |                                   | LP no.  | RAL no. | NCS no.                                    | LP no.            | RAL no. | NCS no.    |
| White                                  | 5                                 | -   | -       |  | P010              | 9010    | S0502-G    |
| Fire Engine Red                        | 6                                 | -   | -       |  | L412              | 3000    | S2070-Y90R |
| Light Grey                             | 6                                 | P9002   | 9002    |  | P022              | 7044    | S2005-G60Y |
| Yellow                                 | 6                                 | -   | -       |  | L980              | 1021    | S1070-Y    |
| Blue                                   | 8                                 | -   | -       |  | L561              | 5019    | S4050-R80B |
| Green                                  | 8                                 | -   | -       |  | L874              | 6003    | S6020-G30Y |
| Brown                                  | 9                                 | -   | -       |  | L434              | 8017    | S8005-Y80R |
| Steel Metallic                         | 6                                 | -   | -       |  | P045              | 9006    | S2500-N    |
| Brick Red                              | 7                                 | -   | -       |  | L742              | 8004    | S4040-Y80R |
| Goosewing Grey                         | 7                                 | -   | -       |  | P461              | 7038    | S3502-Y    |
| Dark Silver                            | 8                                 | -   | -       |  | P044              | 9007    | S5000-N    |
| Anthracite                             | 9                                 | -   | -       |  | P035              | 7016    | S8000-N    |
| Graphite Grey                          | 10                                | -   | -       |  | P036              | 7024    | S7502-B    |
| Black                                  | 10                                | -   | -       |  | P015              | 9005    | S9000-N    |
| <b>L - colours</b>                     | -                                 | <b>L - colours cost extra - enquire with Lindab</b> |         |  |                   |         |            |

**Note:** Slight differences in shade can occur when the overhead doors/facade doors are coated in a combination of LP standard colours and special wet enamel paint.

| Affects of sun |                 |                             |                                |   |   | The table shows the recommended maximum width, depending on colour and affects of the sun. |
|----------------|-----------------|-----------------------------|--------------------------------|---|---|--|
| Colour range   | North<br>Shadow | East/west<br>Partial shadow | East/west<br>Complete sunshine | South<br>(Northern Europe)<br>Complete sunshine | South<br>(Southern Europe)<br>Complete sunshine |  |
| 10             |                 | 7.5                         | 6.0                            | 4.3   | -   |  |
| 9              |                 |                             | 6.7                            | 4.8   | -   |  |
| 8              |                 |                             | 7.5                            | 5.4   | 4.2   |  |
| 7              |                 |                             |                                | 6.1   | 4.8   |  |
| 6              |                 |                             |                                | 7.1   | 5.6   |  |
| 5              |                 |                             |                                |   | 6.7   |  |
| 4              |                 |                             |                                |   |   |  |

If the recommendations are exceeded, problems can arise with thermal deflection, which can be seen in bowed door sections with subsequent leaks or damage.

# Fixings

## Fixings

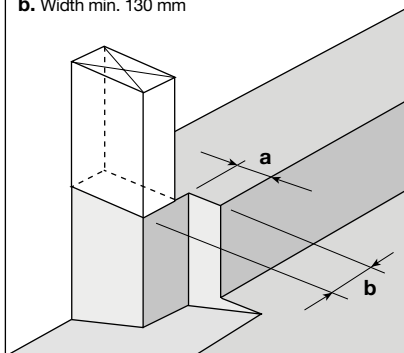
The table on the right shows which fixings should be used in the various wall types.

### Recessed base for frame

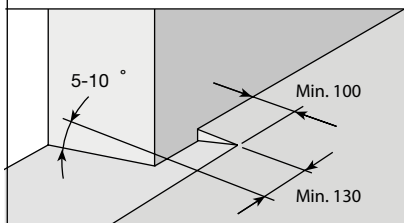
Note: Where the upper edge of the base is higher than the finished floor, a recess should be made in the base for the door frame.

a. Depth = distance in to the door frame/transom

b. Width min. 130 mm



### Design of floor around door



The design of the floor around the door aperture can be designed as shown here with a 5-10° slope for the drainage of rainwater.

## Side seal

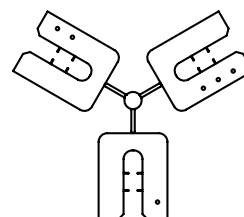
Due to naturally occurring thermal deflection, it may be necessary in certain cases to create more space for the door's movement at the overhead frame. The table on the right shows the types of side seal used in connection with the choice between light and dark colours.

| Hangers                        |                            |
|--------------------------------|----------------------------|
| Length of rails under ceiling: | Minimum number of hangers: |
| 0-3500 mm                      | 1 per rail                 |
| 3501-6500 mm                   | 2 per rail                 |
| 6501-9500 mm                   | 3 per rail                 |

| Fixings<br>(Recommendation)            |  | Mounting materials can be purchased via <a href="http://www.doorlineshop.com">www.doorlineshop.com</a><br>*) An RHS frame construction for the securing of the door's rail system should be mounted. |                                     |            |               |          |
|--|--|--|-------------------------------------|------------|---------------|----------|
| Wall type                              | Underlay   | Number of screws in the upright frame  | Mounting                            |            |               |          |
|  |  |  | Screw type                          | Dowel type | Hole diameter | Torx bit |
| Concrete                               | Min. BN 25   | **A screw is mounted in each set of holes along the entire length of the upright frame   | SKRMON 5355                         | Plug 8S    | Ø 8 mm        | 25       |
| Masonry (solid)                        | Compressive strength 11 N/mm <sup>2</sup><br>Density 1720-1800 kg/m <sup>3</sup>   |  | SKRMON 5355                         | Plug 8S    | Ø 8 mm        | 25       |
| Concrete masonry unit (breaze block)   | Compressive strength 20 N/mm <sup>2</sup><br>Density 1330-1380 kg/m <sup>3</sup>   |  | SKRMON 5370                         | Plug 8SD   | Ø 8 mm        | 25       |
| Lightweight concrete (LECA or similar) | Compressive strength 3 N/mm <sup>2</sup><br>Density 535 kg/m <sup>3</sup>          |  | SKRMON 5370                         | Plug 8SD   | Ø 8 mm        | 25       |
| Steel                                  | Wall thickness 2-4 mm  |  | SKRPLUH 6525RS                      | -          | Ø 5.3 mm      | 30       |
|  | Wall thickness > 4 mm  |  | SKRPL6K HSK6325                     | -          | Ø 6.5 mm      | -        |
| Wood (full screw length)               | Uclass. regular<br>Thickness: 45 mm<br>Moisture content: 18-20%,<br>Tighten screws |  | SKRMON 5355                         | -          | -             | 25       |
| Sandwich-panel                         | ?  |  | Contact Lindab for more information |            |               |          |
| Leaf spring<br>***(Explanation)        |  |  | SKRQPC 9926                         | -          | Ø 10 mm       |          |

\*\* When using the leaf spring where the underlay is anything other than steel, hexagon head screws must be used. The rules for the use of plugs follows the same guidelines as the other types of screws. This concerns all the parts in the leaf spring to be mounted in the wall/building.

Compensation piece PLKLUKARM 100 is used where the squaring up of crooked walls is necessary.



# Accessories - Lock types

## Lock types

### Integrated wicket door

#### Standard incl. cylinder

Lock type KFV, incl. 6 pin JASA Profile cylinder.

#### Standard excl. cylinder

Lock type KFV, excl. cylinder.

#### JASA incl. cylinder

Lock case, JASA 13007, incl. 6-pin JASA cylinder 13047. (Not in Germany)

#### JASA incl. cylinder

Lock case, JASA 13007 excl. cylinder (Not in Germany)

#### Magnet lock incl. cylinder

Standard Magnet lock type EL582, incl. 6-pin JASA cylinder 13047.

#### Magnet lock incl. cylinder

Magnet lock type EL580 with emergency escape function. (Panic lock), incl. 6-pin JASA cylinder 13047.

#### ABLOY incl. cylinder

Lock type ABLOY 4190, incl. ABLOY cylinder 5781. Single latch lock with automatic blocking.

#### ABLOY excl. cylinder

Lock type ABLOY 4190 excl. cylinder. Single latch lock with automatic blocking.

### Lock types Facade doors

#### Standard excl. cylinder

Lock type KFV, excl. cylinder.

#### JASA

Lock case type 13007

#### RUKO 7887

Lock case type 7787

#### RUKO 560

Lock case 560

#### RUKO 1520

Panic lock type 1520

#### RUKO 1560

Lock case type 1560 with electric strike plate

#### Magnet lock incl. cylinder

Standard Magnet lock type EL582

#### Magnet lock incl. cylinder

Magnet lock type EL580 with emergency escape function. (Panic lock)

**Standard incl. cylinder (KFV)**



**JASA incl. cylinder (13007)**



**ABLOY incl. cylinder (4190)**



**RUKO 560**



**RUKO 7887 incl. cylinder**



**EL580 incl. cylinder**



**EL580 incl. cylinder**



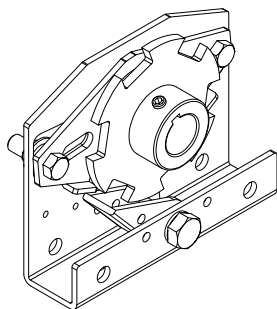
**Electric Strike Plate**



# Accessories - Safety equipment

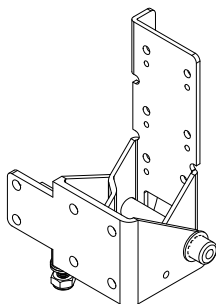
## Safety equipment

Lindab's industrial doors can be supplied with different types of safety equipment. Some of them are statutory, while others can be chosen to achieve maximum safety.



### Spring break device

A safety device that ensures the overhead door does not fall down if a spring breaks. Statutory requirement on manually operated overhead doors.



### Cable break device

A safety device that ensures the overhead door does not fall down if a cable snaps. This is not a legal requirement, but is recommended in places with a lot of pedestrian as well as vehicular traffic, e.g. builders' merchants.



### Slack wire switch

This switch is mounted on the bottom bracket and monitors the wire tension. If it becomes slack, the electrical operation is turned off automatically to avoid the despooling of the wire.

# Accessories - Grilles etc.

## Grilles

Grilles can be mounted to achieve ventilation in a building and are supplied in several variants.

### D11C

Grille type D11C Alu. (For LDI/LDC)  
Measurement W x H: 400 x 297 mm  
(Only possible in bottom section)

### RI1

Grille type RI1 without slider.  
(For LDI/LDC) Black or white  
Measurement W x H: 337 X 132 mm.  
(Only possible in bottom section)

### RI2

Grille type RI2 with slider.  
(For LDI/LDC) White  
Measurement W x H: 337 X 132 mm.  
(Only possible in bottom section)

### STP-1

Perforated steel plate with round holes  
Ø 9.5 mm.  
Air permeation 50.8%  
LDP only  
(Possible in all sections)

### STP-2

Perforated steel plate with round holes  
Ø 5.3 mm.  
Air permeation 40.0%  
LDP only  
(Possible in all sections)

RI1 - White



RI1 - Black



RI2



# Lindab Doorline electrical operation



**It is possible to have electrical operation installed on all Lindab Doorline industrial doors.**

**Electrical operation increases comfort and reduces operating costs.**

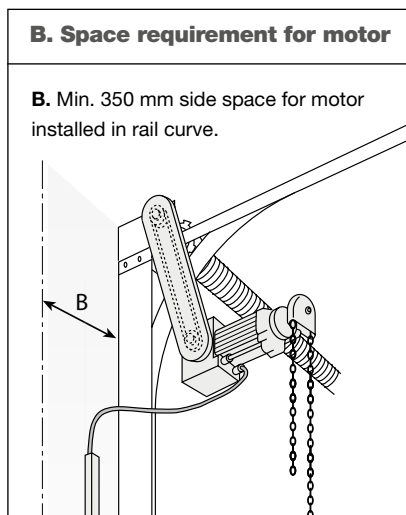
The electrical operation (EHLDC) consists of a motor (BK or BF) and a control system (EHC) with control panel. The controller is supplied with a power cable and attached CEE plug.

If required, basic electrical control can be expanded to include accessories such as an external push-button box, remote control (which makes it possible to operate the door from long distances) or some of all the other accessories, see pages 27-28 and 30.

## Space requirements

**A.** In order to make room for the motor, there must be a minimum of 350 mm side space on the side where you want the motor to be placed.

**B.** The side space can be reduced to 200 mm by installing the motor in the rail curve and using a chain drive. Contact Lindab to hear about restrictions on door weight and choice of motor.



**Motor with chain (BK)**



**Motor with release device (BF)**



**EHC**

Control system / control panel



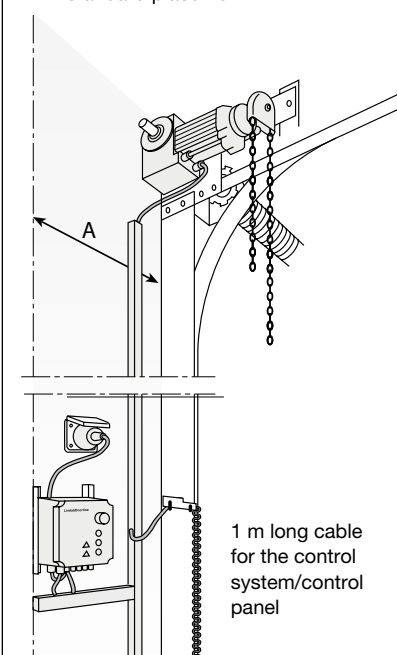
**EHS 30**



Basic electrical controls, which can be used for projects where no major requirements are placed on additional functions.

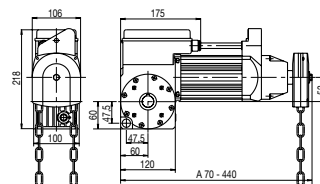
**A. Space requirement for motor**

**A.** Min. 350 mm side space for motor with standard placement.

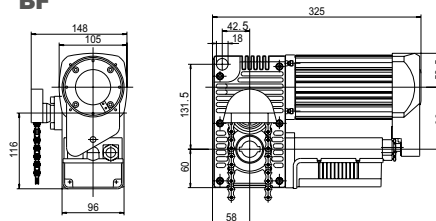


**Motor - dimensions**

**BK**



**BF**



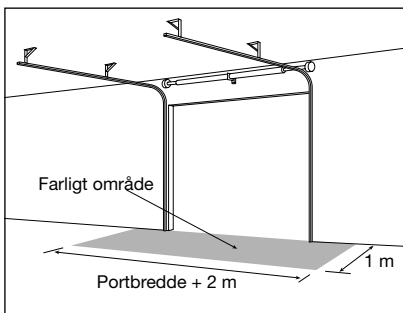


# Choice of Lindab Doorline electrical operation

## Before you choose electrical operation

It is important that the electrical operation for your door matches your needs and wishes, while also complying with current safety requirements.

You must find out what kind of surroundings the door is located in. Is there public access? Is there a risk of untrained persons might place themselves in the overhead door's area of movement (danger zone)? And who has access to operate the door (are they trained or untrained)?



There is public access to doors in car washes, for example. Examples of places to which there is not normally public access include agricultural halls, industrial buildings etc. Talk to your distributor if you are in doubt about the requirements your door must comply with.

## Safety level

In environments where there is public access and anyone, in principle, can go over and press on the operating buttons, the safety level must be high. This also applies to places where anyone can place themselves in the danger zone. In places where there is not public access and where it is expected that those operating the door have been trained for this purpose, the required safety level is somewhat lower.

## Type of operation

In the text on the right and in the table on page 24 you can form an overview of the different types of operation you can choose between and you can see the connection between safety level and type of operation.

## Level of training

The people who are operating the door must have a level of training appropriate to the door's degree of automation.

It is a condition for example that people operating the door in buildings or areas with no or restricted public access have received training in this. Whereas in buildings or areas where there is a risk that unauthorised persons could attempt to operate the door (e.g. at car washes), safety precautions must be subject to more stringent requirements.

The table on the next page shows the requirements in relation to place of use, building type and type of operation.

## Choice of controls

Descriptions of the various control systems and applicability options can be found below.

Also refer to the table on page 24, which gives a clear picture of the different requirements and options in relation to place of use.

## EHLDC without photocells

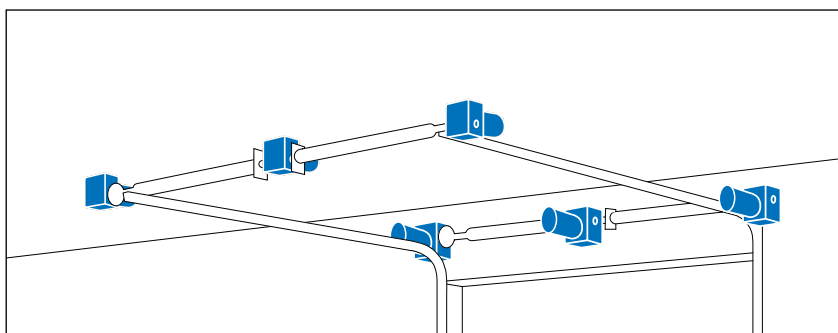
The door can operate automatically by pressing on the control. The door does not need to be visible from the place where it is operated. **Use:** Places where only trained people have access to operate the door or place themselves in the danger zone. There are no legal requirements for photocells.

## EHLDC with photocells

The door can operate automatically, both with the aid of a press button control, hand-held transmitter and other equipment - and the door can be operated even if it is not visible when in operation.

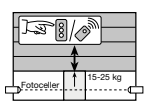


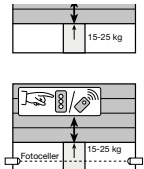


**Use:** Everywhere. Consideration does not need to be given to the placement or training of personnel who operate the door or place themselves in the danger zone.

## Motor - placement options



# Choice of Lindab Doorline electrical operation

## Choice of controls in accordance with EN 13241-1 / EN 12453

| Place of use:  | None or restricted public access (users must be given instruction)   | Public access (no instruction necessary)  |
|--|--|---|
| Examples of types of buildings:  | - Agricultural halls<br>- Industrial buildings<br>- Private property<br>- etc.   | - Car washes<br>- Auto repair shops<br>- Supermarkets<br>- etc.                                       |
| Users:   | Owners and employees have access to operate the door (the owner is responsible for ensuring that users of the door are instructed in its operation as well as danger zones. Untrained personnel must not place themselves in the danger zone). | Everyone has access to operate the door and instruction is not necessary                              |
| Type of operation:   | Requirements:  | Requirements:   |
| <b>EHLDC without photocells*</b><br> | Instruction is required<br>  | Not possible<br> |
| <b>EHLDC with photocells</b><br>    | Free access<br>   | Free access<br>  |

\*) For doors without photocells, radio equipment can only be used in places where there is not public access.



The door must be visible when operated. Safe operation depends on the person operating the door.



The door is operated with the aid of a push button control box. It can only open or close when the push button is held down.



The door is operated with the aid of a key switch. The key must turn before the door can open or close.



The door can be operated using a push button control box. Opens or close automatically once the button is pressed.



The door can be operated by means of a hand-held transmitter or other equipment. Opens or closes automatically upon signal from the transmitter or other equipment.



Indicates the movement of the door during operation - up and down.



The door will reverse direction if it meets an obstacle. The maximum pressure on the obstacle is 400 N (40 kg) before it will reverse.



The door will stop and move upwards as soon as the light beam between the photocells is broken.

# Lindab Doorline electrical operation - EHLDC

## Lindab EHLDC Control:



Lindab's "high-end" control with clear text display and emergency stop. The control system can be supplied with frequency transformer with soft start/stop and speed optimisation. It is also placed in another type of cabinet, which has been specially developed for the harsh environment of a car wash. The control system's software can be updated when new features become available (Future-proofing).

| Selected features:  | Selected DATA:  |
|---|---|
| <ul style="list-style-type: none"> <li>• Auto-close on photo 1 – 999 secs. (safety time 1 – 999 secs.)</li> <li>• Auto-close on times 1 – 999 secs.</li> <li>• ½ open position</li> <li>• 2 programmable inputs</li> <li>• 1 programmable no-voltage output</li> <li>• Runs with auto, dead man's switch or combined function</li> <li>• Weekly clock is built into the controls</li> <li>• Status indication on display</li> <li>• Read-out of number of times the door has been opened</li> <li>• Adjustable power monitoring for increased safety</li> <li>• Error log with time and date</li> </ul> | <ul style="list-style-type: none"> <li>• Dimension of controller (W x H x D) 200 x 200 x 130 mm</li> <li>• Electrical connection: 3 x 230 V / (3 x 400 + N) + PE. F = 50 Hz</li> <li>• Max. fuse: 3 x 10 A</li> <li>• Protection class of controller: IP65</li> <li>• Ambient temperature of controller: -20°C to +60°C</li> <li>• Motors with electronic safety end stops</li> <li>• Operating class of motors: S3-40%</li> <li>• Protection class of motor: IP54 (One motor is IP65)</li> <li>• Ambient temperature of motor: -20°C to +40°C</li> </ul> |

## Motor system for EHLDC

- Electronic safety end stop
- Control cable can be fitted with a plug
- 3 x 400 V / 3 x 230 V selected by changing to a different socket.

### BK - Motor (with chain)

Standard motor with chain for emergency opening in the event of a power failure.

A spring break device is only necessary in special situations, depending on door weight and drum type (with electric doors, LP ensures this).

### BF - Motor (with release device)

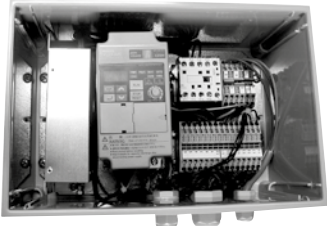
Motor with release device for emergency

opening in the event of a power failure. A spring break device is always necessary. Used in places where it is necessary for the door to be used as an escape route.

### FO - Motor (with frequency transformer)

Motor with frequency transformer, which allows for the following:

- Speed regulation and soft start/stop (FO1). Opening speed up to 500 mm/sec. depending on the drum (for closing speed, see table).
- Soft start/stop (FO2) is recommended for large doors as it increased the door's useful lifetime.



**Frequency transformer for FO**  
Motor control with frequency transformer.

**Type: FO1**, Speed optimisation (high opening speed - up to 500 mm/s, normal closing speed).  
**Requirements:** Must be connected to 1 x 230 V. Soft start/stop.

**Type: FO2**, Soft start/stop (normal opening and closing speed).  
**Requirements:** Connect to 1 x 230 V.

Recommended for large doors.

## Lindab Doorline electrical operation - control system




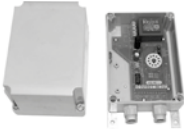









| Motor specification |                  |              |              |             |           |                     |         |        | L/LT<br>S/ST               | H/HT<br>Average speed      | V<br>Average speed         |
|---------------------|------------------|--------------|--------------|-------------|-----------|---------------------|---------|--------|----------------------------|----------------------------|----------------------------|
| Type                | Voltage<br>Volts | Shaft<br>mm. | Torque<br>Nm | Power<br>kW | Current   | Protection<br>class | S3      | RPM    | Rec. opening<br>speed, m/s | Rec. opening<br>speed, m/s | Rec. opening<br>speed, m/s |
| BK1C                | 3x230/3x400      | 25.4         | 100          | 1.30        | 4.6/2.6 A | IP 54               | 40% ED  | 25 RPM | 0.14 - 0.27                | 0.18 - 0.29                | 0.18 - 0.25                |
| BK2C                | 3x230/3x400      | 25.4         | 70           | 0.98        | 3.6/2.1 A | IP 54               | 40% ED  | 16 RPM | 0.09 - 0.17                | 0.12 - 0.18                | 0.12 - 0.16                |
| BK4C                | 3x230/3x400      | 25.4         | 150          | 0.84        | 3.5/2.0 A | IP 54               | 40% ED  | 15 RPM | 0.08 - 0.16                | 0.11 - 0.17                | 0.11 - 0.15                |
| BF7C                | 3x230/3x400      | 25.4         | 100          | 1.30        | 3.5/2.0 A | IP 54               | 40% ED  | 25 RPM | 0.14 - 0.27                | 0.18 - 0.29                | 0.18 - 0.25                |
| BF1C                | 3x230/3x400      | 25.4         | 80           | 0.88        | 2.9/1.7 A | IP 54/ IP65         | 40% ED  | 29 RPM | 0.16 - 0.32                | 0.21 - 0.33                | 0.21 - 0.29                |
| BF4C                | 3x230/3x400      | 25.4         | 90           | 0.88        | 2.9/1.7 A | IP 54               | 40% ED  | 20 RPM | 0.11 - 0.22                | 0.14 - 0.23                | 0.14 - 0.20                |
| BF5C                | 3x230/3x400      | 25.4         | 150          | 0.84        | 3.5/2.0 A | IP 54               | 40% ED  | 15 RPM | 0.08 - 0.16                | 0.11 - 0.17                | 0.11 - 0.15                |
| BF5C 5/4            | 3x230/3x400      | 31.75        | 150          | 0.84        | 3.5/2.0 A | IP 54               | 40% ED  | 15 RPM | 0.08 - 0.16                | 0.11 - 0.17                | 0.11 - 0.15                |
| BF8C                | 3x230/3x400      | 25.4         | 110          | 0.86        | 3.0 A     | IP 54               | 40% ED  | 30 RPM | 0.17 - 0.33                | 0.22 - 0.34                | 0.22 - 0.30                |
| BK5C                | 3x230/3x400      | 25.4         | 110          | 0.86        | 3.0 A     | IP 54               | 40% ED  | 30 RPM | 0.17 - 0.33                | 0.22 - 0.34                | 0.22 - 0.30                |
| BK6C                | 2x230/3x400      | 31.75        | 150          | 0.86        | 3.5/2.0 A | IP54                | 40 % ED | 15 RPM | 0.08 - 0.16                | 0.11 - 0.17                | 0.11 - 0.15                |

F01 runs at 85 Hz OP · F01 DOWN is the frequency from the usage diagram · F02 UP and DOWN are the frequencies from the usage diagram

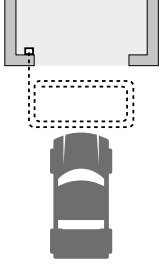

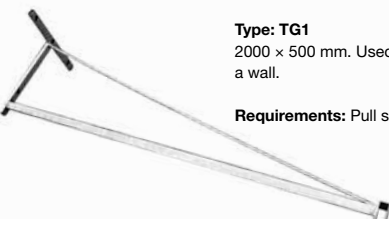


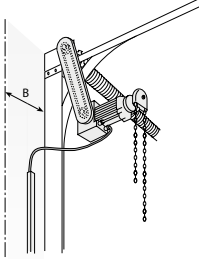




| Motor specification |                      |           |                 | Motor type |      |      |      |      |      |      |                      |                      |    |
|---------------------|----------------------|-----------|-----------------|------------|------|------|------|------|------|------|----------------------|----------------------|----|
| Door type           | Hole height          | Headroom* | Door weight, kg | BK1C       | BK2C | BK4C | BF7C | BF1C | BF4C | BF5C | BF8C/FO1<br>BK5C/FO1 | BF8C/FO2<br>BK5C/FO1 |    |
| L/LT<br>S/ST        | 3680 mm              |           | 165             | •          | •    | •    | •    | •    | •    | •    | 85                   | 50                   |    |
|                     |                      |           | 330             | •          | •    | •    | •    | •    | •    | •    | 50                   | 50                   |    |
|                     |                      |           | 650             |            |      | •    |      |      |      | •    |                      | 50                   |    |
|                     | 5570 mm              |           | 165             | •          | •    | •    | •    | •    | •    | •    | •                    | 81                   | 50 |
|                     |                      |           | 330             | •          | •    | •    | •    | •    | •    | •    | •                    | 50                   | 50 |
|                     |                      |           | 650             |            |      | •    |      |      |      | •    |                      | 50                   |    |
|                     | 7850 mm              |           | 165             | •          | •    | •    | •    | •    | •    | •    | •                    | 54                   | 50 |
|                     |                      |           | 330             | •          | •    | •    | •    | •    | •    | •    | •                    | 50                   | 50 |
|                     |                      |           | 650             |            |      | •    |      |      |      | •    |                      | 50                   | 44 |
| H/HT                | 1745 mm<br>(1200 mm) | 165       | •               | •          | •    | •    | •    | •    | •    | •    | 55                   | 50                   |    |
|                     |                      | 330       | •               | •          | •    | •    | •    | •    | •    | •    | 50                   | 50                   |    |
|                     |                      | 650       |                 |            | •    |      |      |      | •    |      | 45                   |                      |    |
|                     | 2265 mm<br>(1685 mm) | 165       | •               | •          | •    | •    | •    | •    | •    | •    | 52                   | 50                   |    |
|                     |                      | 330       | •               | •          | •    | •    | •    | •    | •    | •    | 50                   | 50                   |    |
|                     |                      | 650       |                 |            | •    |      |      |      | •    |      | 42                   |                      |    |
|                     | 3295 mm<br>(2335 mm) | 165       | •               | •          | •    | •    | •    | •    | •    | •    | 48                   | 48                   |    |
|                     |                      | 330       | •               | •          | •    | •    | •    | •    | •    | •    | 48                   | 48                   |    |
|                     |                      | 650       |                 |            | •    |      |      |      | •    |      | 39                   |                      |    |
|                     | 3295 mm<br>(2665 mm) | 165       | •               | •          | •    | •    | •    | •    | •    | •    | 46                   | 46                   |    |
|                     |                      | 330       | •               | •          | •    | •    | •    | •    | •    | •    | 46                   | 46                   |    |
|                     |                      | 650       |                 |            | •    |      |      |      | •    |      | 38                   |                      |    |
|                     | (3635 mm)            | 165       | •               | •          | •    | •    | •    | •    | •    | •    | 43                   | 43                   |    |
|                     |                      | 330       | •               | •          | •    | •    | •    | •    | •    | •    | 43                   | 43                   |    |
|                     |                      | 650       |                 |            | •    |      |      |      | •    |      | 35                   |                      |    |
| V                   | 2670 mm              | 165       | •               | •          | •    | •    | •    | •    | •    | •    | 58                   | 50                   |    |
|                     |                      | 330       | •               | •          | •    | •    | •    | •    | •    | •    | 50                   | 50                   |    |
|                     |                      | 650       |                 |            | •    |      |      |      | •    |      | 48                   |                      |    |
|                     | 3170 mm              | 165       | •               | •          | •    | •    | •    | •    | •    | •    | 54                   | 50                   |    |
|                     |                      | 330       | •               | •          | •    | •    | •    | •    | •    | •    | 50                   | 50                   |    |
|                     |                      | 650       |                 |            | •    |      |      |      | •    |      | 44                   |                      |    |
|                     | 4040 mm              | 165       | •               | •          | •    | •    | •    | •    | •    | •    | 49                   | 49                   |    |
|                     |                      | 330       | •               | •          | •    | •    | •    | •    | •    | •    | 49                   | 49                   |    |
|                     |                      | 650       |                 |            | •    |      |      |      | •    |      | 40                   |                      |    |
|                     | 4900 mm              | 165       | •               | •          | •    | •    | •    | •    | •    | •    | 44                   | 44                   |    |
|                     |                      | 330       | •               | •          | •    | •    | •    | •    | •    | •    | 44                   | 44                   |    |
|                     |                      | 650       |                 |            | •    |      |      |      | •    |      | 36                   |                      |    |
|                     | 7000 mm              | 165       | •               | •          | •    | •    | •    | •    | •    | •    | 34                   | 38                   |    |
|                     |                      | 330       | •               | •          | •    | •    | •    | •    | •    | •    | 34                   | 38                   |    |
|                     |                      | 650       |                 |            | •    |      |      |      | •    |      | 31                   |                      |    |

\*) Max. headroom cannot always be complied with due to the drum size. Measurements in brackets indicate the headroom that can always be achieved.

# Lindab Doorline electrical operation - accessories










|   |   |
|---|---|
|  <p><b>Push-button box, 3 buttons</b><br/>Extra control buttons UP-STOP-DOWN.</p> <p><b>Type: BT1</b><br/>70 × 135 × 50 mm.<br/>Can be mounted as an extra internal button or external push button.</p>  |  <p><b>Radar</b><br/>Radar control of door.</p> <p><b>Type: RA1</b><br/>134 × 82 × 75 mm.<br/>Directional radar that can distinguish between pedestrian and vehicle traffic, crossing traffic, traffic that is approaching or moving away. UP is standard, but can also be used for KIP or DOWN.</p> <p><b>Requirements:</b> Photocells, type FS1. Connect to 12-24 V from a separate power supply (UD1 or lamp control system LS can be used).</p>   |
|  <p><b>Emergency stop, separate</b><br/>Extra emergency stop.</p> <p><b>Type: BT2</b><br/>70 × 70 × 50 mm.<br/>An emergency stop should be located at all operating points.</p>  |  <p><b>Power supply box 24 V</b><br/>Power supply box for diverse accessories.</p> <p><b>Type: UD1</b><br/>125 × 175 × 160 mm.<br/>Box with 24 V outlet. 11 pole socket for inserting of driveway detector KD1.</p> <p><b>Requirements:</b> Connect to 1 × 230 V.</p>   |
|  <p><b>Push-button box, pulse type</b><br/>Control button with pulse function.</p> <p><b>Type: BT3</b><br/>70 × 70 × 50 mm.<br/>Can be mounted as external button. The standard function is KIP, but it can be used for UP, STOP or DOWN.</p>  |  <p><b>Lamp control system</b><br/>Control box for the connection of warning lights. Incl. 12 V 20 VA outlet.</p> <p><b>Type: LS1</b><br/>180 × 180 × 125 mm.<br/>The control box has 2 NO/NC output relays. These are mounted for internal 12 V / 20 VA supply, but can be used as a potential free set of contacts. Standard function LS1 (green output) lights up when the door is open and the red output lights up when the door is closed. The function changes the DIP setting. See also "Lamp functions" and "Advanced lamp functions".</p> <p><b>Requirements:</b> 1 × 230 V. Motor cannot be BF6.</p> <p><b>Lamp functions</b><br/>Lamp functions, which can be set via the DIP switch:</p> <p><b>Type: LS2.</b> Green is lit when the door is open, Red is lit when the door is not open.<br/><b>Type: LS3.</b> Green is lit when the door is open, Red is lit when the door is neither open nor closed (Red switches off when the door is closed).</p> <p><b>Requirements:</b> Lamp control system, type LS1.</p> |
|  <p><b>Key switch</b><br/>Key switch UP-DOWN in key.</p> <p><b>Type: BN1</b><br/>70 × 130 × 70 mm.<br/>Control button with UP-DOWN in key and separate stop.<br/>The cylinder can be changed to an encodable RUKO cylinder. Supplied with 2 keys.</p>  | <p><b>Advanced lamp functions</b><br/>Additional lamp functions which are possible via the DIP switch:</p> <p><b>Type: LF1.</b> Red lamp flashes.<br/><b>Type: LF2.</b> Red lamp lights up when close signal is given, port starts to close after 5 secs. Possible in conjunction with LS2/LS3.<br/><b>Type: LF3.</b> Red lamp flashes when close signal is given, port starts to close after 5 secs. Possible in conjunction with LS2/LS3.</p> <p><b>Requirements:</b> Lamp control system, type LS1.</p>  |
|  <p><b>Key switch</b><br/>Key switch ON / OFF in key.</p> <p><b>Type: BN2</b><br/>70 × 190 × 70 mm.<br/>Control buttons opened up with key.<br/>The cylinder can be changed to an encodable RUKO cylinder.<br/>Supplied with 2 keys.<br/>The key must be inserted before the push buttons will work.</p> |  <p><b>Warning lamp</b><br/>Red / green LED lamp 12 V / 300 mA</p> <p><b>Type: LA1</b><br/>130 × 130 × 70 mm.<br/>Used in conjunction with the LS lamp control. With pivotable wall mount.</p> <p><b>Requirements:</b> Lamp control system, type LS1.</p>  |
|  <p><b>Key switch</b><br/>Key operation with pulse function in key.</p> <p><b>Type: BN3</b><br/>70 × 90 mm<br/>Operated with single button operation in key. KIP is standard, but can also be used for UP or DOWN. The cylinder can be changed to an encodable RUKO cylinder. Supplied with 2 keys.</p>  |  <p><b>Photocell</b><br/>Photocell protection of the door aperture.</p> <p><b>Type: FS1</b><br/>Photocell protection must be used in accordance with the table on page 26. EHLDC controls cannot work with automatic closure unless photocells are fitted.</p>  |
|  <p><b>Key switch</b><br/>Key switch ON/OFF.</p> <p><b>Type: BN4</b><br/>75 × 75 × 70 mm.<br/>Separate key switch for stop circuit or for disconnection of the push button.<br/>Supplied without cylinder.</p>   |   |
|  <p><b>Code entry keyboard</b></p> <p><b>Type: BK1</b><br/>70 × 70 × 15 mm.<br/>UP is standard, but can also be used for KIP or DOWN. Programmed with 4-digit code.</p> <p><b>Requirements:</b> Must be connected to either 24 V or 1 × 230 V.</p>   |   |

## Lindab Doorline electrical operation - accessories

|   |   |
|---|---|
|  <p><b>Driveway detector</b><br/>Inductive sensor detects vehicles.</p> <p><b>Type: KD1</b><br/>125 x 175 x 160 mm.<br/>UP is standard, but can also be used for KIP or DOWN.</p> <p><b>Requirements:</b> Photocells, type FS1. Requires UD1 box.</p>  | <p><b>Cattle protection</b></p> <p>The spiral cable is moved up to a height that ensures cattle etc. will not chew on the cable</p>   |
|  <p><b>Pull switch</b><br/>Pull switch for cord operation.</p> <p><b>Type: TK1</b><br/>Control for ceiling mounting that is activated by pulling a cord. KIP is standard, but can also be used for UP.</p> <p><b>N.B.:</b> Photocells type FS1 are recommended.</p>  | <p><b>Light barrier</b></p> <p>Can be mounted as a bottom edge protection for EHLDC without the use of additional power supply.</p> <p><b>Type: ????</b><br/>Mounted in the frame and protects the door aperture to a height of 2.5 metres.<br/>Can also be used as photocell, but this requires additional power supply (UD1 or LS lamp control system can be used).</p>   |
|  <p><b>Bracket for pull switch</b><br/>Mounting bracket for pull switch.</p> <p><b>Type: TG1</b><br/>2000 x 500 mm. Used for mounting pull switch on a wall.</p> <p><b>Requirements:</b> Pull switch, type TK1.</p>   | <p><b>Heat pad for motor</b></p> <p>Mounted directly on the gear housing.</p> <p><b>Type: ????</b><br/>Self-adhesive heating elements incl. thermostat for mounting on the gears to ensure operation in cold environments.</p> <p><b>Requirements:</b> Connect to 230 V or 400 V</p>  |
|  <p><b>Output module</b><br/>PCB module with 3 contacts for mounting in radio connector.</p> <p><b>Type: UDM1</b><br/>Plug-in PCB module with 3 potential free NO/NC contacts.</p> <p>Contact 1 is the slave for the bottom edge stop.<br/>Contact 2 gives a signal at top point and 1/2 open.<br/><b>Program 1:</b> Contact 3 is activated when a photocell beam is blocked<br/><b>Program 2:</b> Contact 3 is activated when a stop circuit is broken<br/><b>Program 3:</b> Contact 3 is activated in fail mode or when a stop circuit is broken.</p> <p><b>Requirements:</b> Cannot be used together with an RM1 radio receiver. Max. voltage per outlet is 300 mA.</p> |  <p><b>Radio receiver</b><br/>433 MHz plug-in radio module for EHLDB.</p> <p><b>Type: RM1</b><br/>The module can be used in conjunction with senders of the types HS2 and HS0<br/>The receiver has a random 6-digit code for optimal security.<br/>Please note that the range can be reduced in steel buildings and if there is electrical disturbance of the signal</p> |
|  <p><b>Chain drive</b><br/>Chain drive unit for use in places where side space for the motor is limited.</p> <p><b>Type: KT1</b><br/>Requires min. 200 mm side space.<br/>Can be used for all motor types with 1" shaft.</p> <p>Max. door weight: 250 kg.</p>  |  <p><b>Radio receiver</b><br/>433 MHz radio receiver for wall mounting.</p> <p><b>Type: RM4</b><br/>80 x 130 mm<br/>The basic design of the receiver is the same as RM1, but is equipped with 4 relay outputs which allow it to control other makes and types of doors</p> <p><b>Requirements:</b> Connect to either 1 x 230 or 10 - 30 V AC/DC</p>                      |
| <p><b>Slack wire switch</b><br/>Set of contacts for the detection of slack wires.</p> <p><b>Type: ??????</b><br/>38 x 112 x 15 mm.<br/>The slack wire switch is mounted on the bottom bracket</p>   |  <p><b>Hand-held transmitter, 2 channel</b><br/>433 MHz 2 channel hand-held transmitter.</p> <p><b>Type: HS2</b><br/>56 x 92 x 23 mm.<br/>The transmitter can be used in conjunction with RM1 and RM4. KIP controls</p> <p><b>Requirements:</b> RM1 or RM4 radio receiver.</p>   |
|  <p><b>Truck radio with 999 channels</b><br/>433 MHz truck radio with 999 channels</p> <p><b>Type: TS99</b><br/>For fixed installation in trucks and similar.<br/>Free choice of channel for the individual doors, so that the channel number and door number are identical. UP - STOP - DOWN and KIP.</p> <p><b>Requirements:</b> RM1 or RM4 radio receiver.<br/>Must be connected to 12-24 V DC.</p>  |  <p><b>Hand-held transmitter, 10 channel</b><br/>433 MHz 10 channel hand-held transmitter.</p> <p><b>Type: HS10</b><br/>56 x 92 x 23 mm.<br/>The transmitter can be used in conjunction with RM1 and RM4. UP - STOP - DOWN</p> <p><b>Requirements:</b> RM1 or RM4 radio receiver.</p>  |

# Lindab Doorline electrical operation - accessories

## Marantec Bi-Linked (Very safe radio system in a smart design)

|  |  |
|--|--|
|  <p><b>Marantec radio receiver</b><br/>Marantec 868MHz Bi-Linked</p> <p><b>Type: DIG992</b></p> <p>Two-channel radio receiver that can be used in conjunction with the Marantec Bi-Linked transmitters.<br/>Mounted behind the lid of the EHLDC control.<br/>IP20 Ingress Protection Rating</p> <p><b>Requirements: 12 - 24 V AC/DC</b></p> |  <p><b>Marantec radio receiver</b><br/>Marantec 868MHz Bi-Linked</p> <p><b>Type: DIG992IP65</b></p> <p>Two-channel radio receiver that can be used in conjunction with the Marantec Bi-Linked transmitters.<br/>Well-suited to places with poor radio coverage and for EHS30 control as the IP65 Ingress Protection Rating ensures that it can be mounted on a wall.</p> <p><b>Requirements: 12 - 24 V AC/DC</b></p> |
|  <p><b>Hand-held transmitter, 2 channel</b><br/>Marantec 868MHz Bi-Linked</p> <p><b>Type: DIG572</b></p> <p>39 x 60 x 12 mm<br/>Hand-held transmitter which can be used in conjunction with radio receivers of types DIG992 and DIG992IP65</p>  |  <p><b>Hand-held transmitter, 10 channel</b><br/>Marantec 868MHz Bi-Linked</p> <p><b>Type: DIG506</b></p> <p>39 x 112 x 17 mm<br/>Hand-held transmitter which can be used in conjunction with radio receivers of types DIG992 and DIG992IP65</p>  |
|  <p><b>Hand-held transmitter, 4 channel</b><br/>Marantec 868MHz Bi-Linked</p> <p><b>Type: DIG564</b></p> <p>39 x 60 x 12 mm<br/>Hand-held transmitter which can be used in conjunction with radio receivers of types DIG992 and DIG992IP65</p>  |  <p><b>3-channel code keypad</b><br/>Marantec 868MHz Bi-Linked</p> <p><b>Type: DIG526</b></p> <p>80 x 118 x 35 mm<br/>IP54<br/>The code keypad can be used in conjunction with radio receivers of types DIG992 and DIG992IP65</p>   |
|  <p><b>3-channel code keypad</b><br/>Marantec 868MHz Bi-Linked</p> <p><b>Type: DIG525</b></p> <p>80 x 102 x 35 mm<br/>The code keypad can be used in conjunction with radio receivers of types DIG992 and DIG992IP65</p>  |  <p><b>Internal pressure</b><br/>Marantec 868MHz Bi-Linked</p> <p><b>Type: DIG644</b></p> <p>82 x 83 x 26 mm<br/>The internal pressure can be used in conjunction with radio receivers of types DIG992 and DIG992IP65</p>  |
|  <p><b>Finger scanner</b><br/>Marantec 868MHz Bi-Linked</p> <p><b>Type: DIG528</b></p> <p>80 x 118 x 35 mm<br/>IP54<br/>The finger scanner can be used in conjunction with radio receivers of types DIG992 and DIG992IP65</p>   |  |

## Lindab Doorline electrical operation - accessories

## Marantec Multi-bit (Radio system that is simple to use if many hand-held transmitters need to be coded)

|  |   |
|--|---|
|  <p><b>Marantec radio receiver</b><br/>868 MHz Multi-bit.</p> <p><b>Type: MUR1</b><br/>Single-channel radio receiver that can be used in conjunction with the Marantec Multi-bit transmitters. Mounted behind the lid of the EHLDC control. IP20 Ingress Protection Rating</p> <p><b>Requirements:</b> 12-24 V AC/DC</p>  |  <p><b>3-channel code keypad</b><br/>868 MHz Multi-bit.</p> <p><b>Type: MBK2</b><br/>70 × 110 × 48 mm.<br/>The code keypad can be used in conjunction with radio receivers of types MUR1 and MUR2.</p> |
|  <p><b>Marantec radio receiver</b><br/>868 MHz Multi-bit.</p> <p><b>Type: MUR2</b><br/>Single-channel radio receiver that can be used in conjunction with the Marantec Multi-bit transmitters. Well-suited to places with poor radio coverage and for EHS30 control as the IP65 Ingress Protection Rating ensures that it can be mounted on a wall.</p> <p><b>Requirements:</b> 12-24 V AC/DC</p> |   |
|  <p><b>Hand-held transmitter, 2 channel</b><br/>868 MHz Multi-bit.</p> <p><b>Type: MHS2</b><br/>39 × 85 × 14 mm.<br/>Hand-held transmitter which can be used in conjunction with radio receivers of types MUR1 and MUR2.</p>   |   |
|  <p><b>Hand-held transmitter, 4 channel</b><br/>868 MHz Multi-bit.</p> <p><b>Type: MHS4</b><br/>39 × 85 × 14 mm.<br/>Hand-held transmitter which can be used in conjunction with radio receivers of types MUR1 and MUR2.</p>  |   |
|  <p><b>Hand-held transmitter, 3 channel</b><br/>868 MHz Multi-bit.</p> <p><b>Type: MHS3</b><br/>38 × 72 × 12 mm.<br/>Hand-held transmitter which can be used in conjunction with radio receivers of types MUR1 and MUR2.</p>  |   |
|  <p><b>Hand-held transmitter, 10 channel</b><br/>868 MHz Multi-bit.</p> <p><b>Type: MHS10</b><br/>38 × 112 × 15 mm.<br/>Hand-held transmitter which can be used in conjunction with radio receivers of types MUR1 and MUR2.</p>   |   |



# Replacement air

## Air replacement control

In buildings of a certain size or which are used for certain purposes, fire ventilation is required in accordance with fire regulations, and in most cases replacement air will also be required in order to prevent flue gas explosions. Replacement air will also make the job of extinguishing a fire much safer. Lindab's replacement air, type BA2, ensures that the door will open should the building's automatic opening vent (AOV) give the signal.

## BA2 Air replacement control (Description)

Electrical operation with frequency transformer and UPS\*. The electrical controls comply with current requirements for replacement air controls in Denmark, including DBI guideline 027, EN 12101-10 and it is approved for use together with Lindab bottom edge protection. This is a replacement air control which requires a 72-hour battery back-up, which is why there is no external control button for operation when there is no supply voltage present. In this case the back-up time will be reduced.

## Locking of BA2-controlled doors

Automatic locking type LSA1, which cannot be opened manually with motor engaged. The lock is mounted on a bottom bracket with a hook in the floor.

If, in connection with BA2, accessories are also selected which can open the door such as a radar, emergency stop should also be chosen, as it is the only way to block the opening of the door.

Doors with low ceilings can be equipped with an anti-lift bracket that functions as an automatic lock.

\*) Battery back-up

## Product features

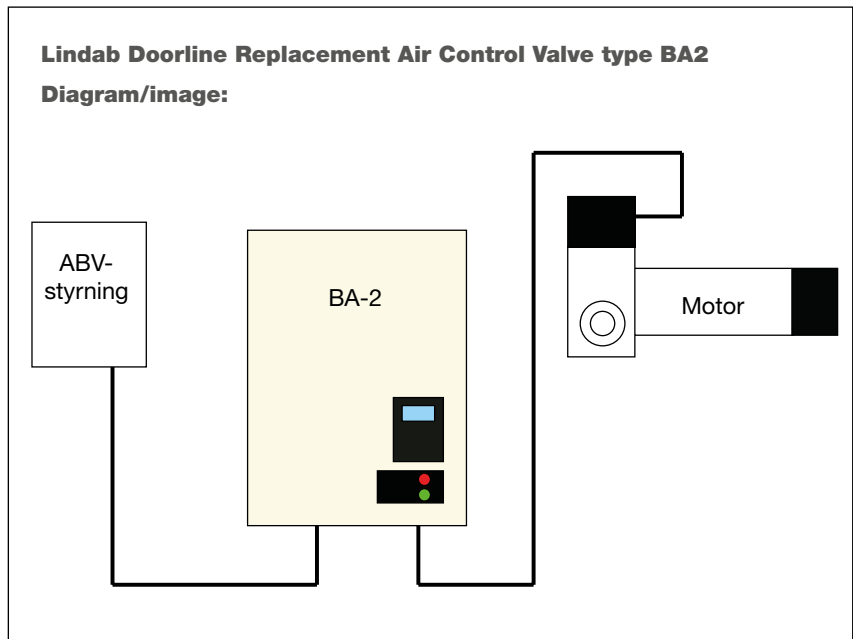
Standard electrical control with 7 m cable and 100 Nm motor. Extra cable can be ordered.  
Standard electrical control with 7 m cable and 140 Nm motor. Extra cable can be ordered. Motor for 5/4" shaft can be ordered.  
Fire cables between the control and the motor.  
Clear text display on lid.  
Simple installation and commissioning.

## Accessories:

BT1, BT2 and BT3 buttons  
BN1, BN2 and BN4 switches  
BN3 control  
Photocells  
Marantec radio (requires photocells)  
Lamp control system  
Radar  
Driveway detector  
Light barrier

## Measurements and Data:

|                                     |                    |
|-------------------------------------|--------------------|
| Steel casing W x H x D:             | 400 x 600 x 200 mm |
| Power supply:                       | 1 x 230 Vac        |
| Output to motor:                    | 3 x 230 Vac        |
| Size UPS:                           | 2000 W / 1400 VA   |
| Max. fuse:                          | 10 A               |
| Ingress Protection Rating, control: | IP66               |
| Ingress Protection Rating, motor:   | IP54               |



# Car washes

## Problems associated with car washes:

Industrial doors installed in car washes are exposed to extreme conditions in the form of water, heat and cold, and corrosive chemicals. For this reason Lindab has developed a special "car wash concept", where the door has been equipped to stand up to these conditions.

- There are many different makes and models of car wash machines with a variety of controls, so installation of door controls will vary from car wash to car wash.
- Installations must comply with legislation, which means there must be a defined separation between the car wash controls and door controls.
- There must be no voltage communication between the car wash and the door.
- Servicing car washes can prove troublesome, as it can be difficult to determine whether the fault lies with the car wash, the door or the communication between the two.

- Doors must be closed while the car wash machinery is in operation, and the car wash machinery must stop if the door is opened during washing (Restarting a car wash machine is difficult).
- In the summertime it is preferable for the door(s) to be open between washes to give the car wash adequate ventilation. In the wintertime, the doors need to be kept close to avoid the ice forming in the car wash and its machinery.

- There are rigorous demands on the sealing class for controls located in the actual car wash.

## The Lindab concept

Lindab has developed a simplified concept that fulfils the above demands in connection with car wash machinery.

## Door panels

- The door panel is produced as LDI, LDC or LDP as required.
- The panel surface in either aluminium or steel must be lacquered.
- All cassettes (bottom, top, side and door cassettes as well as any wind braces) are also lacquered.
- All hinges, rollers (LP type) and screws must be stainless steel to withstand the aggressive environment.
- We recommend that load-bearing wires are produced in galvanised steel, as stainless steel will crack before the galvanised wire corrodes (so they have a longer useful lifetime). Stainless steel wire can be chosen if required.
- Windows must be of type TT10, TT20, or LDP sections with insulated pane type HD (HARD) or WA (WATER).

## Rail/spring system

- Springs are dimensioned to be opened a minimum of 70000 times.
- Springs are encapsulated.
- Flange bearings (reinforced bearings) are used.
- Frames, rail tracks and other parts of the rail system are made in galvanised steel.

## Electrical operation

- Lindab door controls **must** be installed so that the door is visible from the place of operation, which means in practice that the controls must be installed inside the car wash. This requires a high degree of sealing and makes it necessary to consider the problem of condensation forming in the control box. The door control is installed in a junction box with a heating element and thermostat, which eliminates the problem of condensation.



- The motor is a BF1 with IP65 sealing class.
- Communication to and from the car wash is placed in a plug-in terminal board, from where it is easy to connect, there is a good overall view and a fixed definition. It is a condition that the car wash machine uses no-voltage relay outputs. Signals from the door control to the car wash machine are provided by a no-voltage contact set.

The signals to the car wash machine are:

- Door closed
- Photocell beam blocked

The signals from the car wash machine are:

- Close door
- Open door

- It must **always** be the car wash machine's job to handle opening and closing of the door under normal operation, including any radar or driveway detector.

- The controls are equipped with a changeover switch for summer and winter operation.

- Servicing is simplified by the fact that there is only one place to look for communication between the car wash machine and door (signals can be disconnected from the plug-in terminal board in the event of troubleshooting)

- Door controls, incl. interface, can be CE labelled as a single unit and the car wash machine can be CE labelled as another unit.

## Special types of buildings

No liability can be assumed for any damage/corrosion on doors installed in drying/hot rooms or refrigeration/freezer rooms.

# Lindab Doorline sectional garage doors - descriptions

*The text, or an excerpt from it, can be adapted or used as inspiration in connection with the descriptive section of tender documents in connection with a specific project.*

## Rail system

The rail system, consisting of frame, rail tracks and spring system, allows for the system to be integrated into a building in a way that takes up the least possible space, thus providing an optimal use of the space.

Wall and ceiling mounting must be carried out in a way that ensures the rail system will remain completely stable.

All steel parts must be galvanised and must, just like the other door components, be built as stable and sturdy products that ensure a long lifetime.

The vertical rails must be an integrated part of the frame and allow the door panel to bend inwards and outwards as a result of wind and temperature differences.

The spring system must be manufactured with torsion springs and 25 mm spring shaft as minimum.

The bearing plates for the spring shaft must have solid bearings and there must be protection against the door falling in the form of a spring break safety device or motor. It must be possible to tighten and balance the spring system so that a lightweight, stable door function can be achieved.

It must be possible to install a cable break device for the wire system.

## Door panels

The door panel must be constructed from horizontally aligned elements with a length corresponding to the width of the door panel. It must be possible to combine the individual elements so that the door panel is "customised" for the door aperture.

The panels must be designed in such a way that they effectively prevent fingers from being trapped to a row height of 2.5 m above the floor. The danger of trapping fingers between the rollers and rails must be similarly eliminated.

## Door panel made with sandwich panel sections

The door panel is manufactured from 600 mm high sandwich panels with 46 mm polystyrene core and finished as either A or B:

A. Aluminium stucco (Stucco embossed aluminium sheet).

The panels shall be supplied with the external and internal sides: 1) untreated, 2) with choice of standard colour or 3) with a special lacquer upon request.

B. Steel, external and internal sides supplied with: 25 mu polyester surface treatment in a choice of standard colour or special lacquer coating in a choice of colour.

The 46 mm thick sandwich panels must have a max. U-value of 0.6 W/m<sup>2</sup>K. Assembled as a 4 x 4 m door panel without windows, the max. U-value is 1.2 W/m<sup>2</sup>K. The sandwich panels must be constructed with horizontally aligned tracks so that the door panel is seen as one unbroken surface when closed.

## Door panel made with frame sections

The door panel is manufactured from \_\_\_\_ mm high panels (min. 300 mm, max. 800 mm) as a frame construction of extruding and anodised aluminium profiles.

The frames are supplied with one of the following surface treatments: 1) natural anodised or 2) special lacquer coating in a choice of colour.

The frame sections are manufactured with the preferred window type/filling (see section: Windows and fillings).

The fillings shall be supplied with the external and internal sides:

- 1) Aluminium-stucco (untreated, with a choice of standard colour or specially lacquered) or with
- 2) Steel (25 mu polyester surface treatment in a choice of standard colour or specially lacquered)

## Door panel composed of frame and sandwich sections

It must be possible to combine frame and sandwich panel sections upon request.

## Windows and fillings

### Sandwich panel sections

The door panel sections indicated (no.: \_\_\_\_ ) are supplied with windows (type: \_\_\_\_ ) across the entire length of the door panel (see list of windows on page 14).

The windows are mounted in milled grooves. A robust and weather resistant plastic frame holds the window securely in place and sealed against water and wind penetration.

### Frame sections

The door panel sections indicated (no.: \_\_\_\_ ) are supplied with windows/fillings (type: \_\_\_\_ ) across the entire length of the door panel (see list of windows on page 14).

The windows/fillings are mounted in aluminium frames with weather resistant seals that can hold the window/filling securely in place and sealed against water and wind penetration.

### Sealing

The door panel must be able to close tightly in the panel joints and along all four sides in the door aperture.

The seal is manufactured with weather and oil resistant rubber seals of a type that retains its elasticity in the entire temperature range, from +80°C to -55°C.

The sealing strips on the individual door panel sections are installed in a pre-moulded groove. On the frame, the sealing strip is an integrated part of the frame.

In no places may the sealing strips simply be glued on.

### Wicket doors

The wicket door is constructed as an integrated part of the door panel.

The height of the wicket door shall be: 3½ sections (sandwich panel doors only), 4 sections (for both sandwich panel doors and frame doors) or 3 sections (frame doors only), see the list on pages 16-17.

Wicket doors are manufactured in the same material, design and panel colour as the door panel.

Wicket doors are manufactured with windows in the sections indicated (no.: \_\_\_\_ ). The type of window must be: \_\_\_\_ (see the list of windows on page 14).

Windows that are mounted in the wicket door sections must, together with the rest of the door panel, appear as an integrated part of a unified window ribbon.

Wicket doors are supplied with lock, door closer, door handle... etc as required.

### Facade doors

The facade door, which shall be the primary access route for through traffic, is located at the side of the overhead door.

The design, materials and colour must be as indicated for the door panel.

The door is supplied with the same type of windows as the door panel and positioned as indicated.

### Side panels

Side panels must resemble the door panel in terms of element design, materials and colour.

Facade doors are built into the side panel as an integrated section so that the side panel and door appear as one unified whole.

### Overhead panels

Overhead panels must resemble the door panel in terms of element design, materials and colour.

### Door operation

#### Manual operation

The door shall be supplied with traction rope as standard and be well-balanced and smooth running, so that manual operation can be performed without difficulty. It must be possible to install a hand chain for manual operation.

#### Electrical operation

The door is supplied with electrical controls and the control system indicated.

All electrical operation systems must fulfil the Danish Working Authority's safety requirements in this area.

#### Delivery and servicing

Doors must be delivered in accordance on the agreed date as a complete and ready to install solution.

Doors must be installed, tightened and balanced by the supplier's fitter so that the door runs smoothly and without difficulty.

The supplier must be able to enter into a service agreement regarding regular maintenance (annual inspection and lubrication) and repairs within 24 hours in connection with collisions, for example.



## Good Thinking

**At Lindab**, good thinking is a philosophy that guides us in everything we do. We have made it our mission to create a healthy indoor climate – and to simplify the construction of sustainable buildings. We do this by designing innovative products and solutions that are easy to use, as well as offering efficient availability and logistics. We are also working on ways to reduce our impact on our environment and climate. We do this by developing methods to produce our solutions using a minimum of energy and natural resources, and by reducing negative effects on the environment. We use steel in our products. It's one of few materials that can be recycled an infinite number of times without losing any of its properties. This means less carbon emissions in nature and less energy wasted.

**We simplify construction**