Alignment instructions

Deflecting mirror column UMC-1002/LL and COMPACT/AS-i C501L/2/A (C500L/2/A) incorporating laser alignment aid

Required equipment and tools

- Safety light grid transmitter CT501L/2/A (CT500L/2/A), safety light grid receiver CR500L/2/A (CR500L/2/A), including MagnetKey (for the activation of the adjustment laser, included as part of the standard delivery for the safety light grid)
- BT-SSD swivelling brackets (order no. 560300), 2 for transmitter and 2 for receiver
- UMC-1002/LL mirror column
- UMC accessory set, order no. 430100 (included as part of standard UMC delivery)
- Hexagonal Allen spanners SW4, SW5 and SW6
- Open-ended spanner SW10
- Hexagonal spanners SW16 and SW17
- Large screwdriver with blade breadth of 8 mm
- Drill with 10 mm masonry drill bit
- Hammer

Introductory note

This laser alignment aid, incorporated in the transmitter (8), is principally designed to facilitate the correct alignment of the mirror columns and the individual mirrors they comprise. For technical reasons it is not possible to manufacture the incorporated laser alignment aids so as to achieve 100% parallelism of beam. If, for example, the transmitter (8) is adjusted in such a way that the upper laser beam falls on the adjustment template (5b) in the middle of the marked target, it may well happen that the lower laser beam does not fall on the middle of the lower adjustment template (5a), and it may even miss it altogether. In this case the upper mirror path should be adjusted first, then the transmitter (8) should be aligned to the lower adjustment template (5a) and finally the lower mirror path should be adjusted.

Procedural steps

Safety warning for all procedural steps of the entire alignment process
The adjustment laser belongs to laser class II. Never allow the laser beam to shine directly into the eye, as the eye may be damaged as a result.

1. First steps of assembly

1. 1 Fasten transmitter (8) and receiver (9) vertically and at the same height (400/900) above floor level, by means of the swivelling brackets (1) in the case of assembly on the cabinet, otherwise by means of the device columns.

Note
The oblong hole on the swivelling bracket is designed to facilitate the fastening of the swivelling bracket (1) to the cabinet.
The distance of the two swivelling brackets for the transmitter and the two swivelling brackets for the receiver should not exceed a maximum of 300 mm (in each case, a distance of 150 mm from the centre of the housing).

1.2 Mark out the operating range (protective field) of the machine with a marking pen (chalk) or with string on the floor (2).

Note
The mirror columns should be placed in such a way that the connecting lines of the midpoints of the fastening produce an angle of 90°.

1.3 Using the drilling template (3) (included in UMC-1002/LL standard delivery), drill at each of the corners of the protective field, for each UMC mirror column, three drill holes of 10 mm diameter to a depth of 80 mm.
1.4 Insert floor fastenings.
1.5 Set up UMC columns (4) so that they fit exactly, and tighten with three M10 nuts, exerting a pressure of 40 Nm.
1.6 Align UMC columns vertically by tightening the adjustment screws (24). Here the spirit level (25) in the foot of the column may be used as a rough guide to alignment.

Safety warning
Before switching on the safety light grid, ensure that the outputs of the light grid are disconnected, and that external precautions have been taken to prevent any dangerous movement of the device and to make sure that it cannot be switched on again (with AS-i systems, the safety monitor should be in STOP).

1.7. Switch on transmitter CT501L/2/A (CT500L/2/A) and receiver CR501L/2/A (CR500L/2/A) (supply voltage by means of AS-i bus system).

2. Adjustment of the upper light axis (taking three UMC mirror columns as an example)

2.1 Place the adjustment template (5a) (included in UMC-1002/LL standard delivery) on the upper mirror of the mirror column adjacent to the transmitter (column 1).

Note
The template must always lie flat on the mirror.

2.2 Loosen the fastening and clamping screws of the swivelling brackets (1) of the transmitter a little, so that it becomes possible to swivel the brackets and to adjust the vertical positioning and the height.
2.3 Activate the adjustment laser (11) by touching the MagnetKey (7) briefly to the indicated spot on the front plate. The adjustment laser (11) will remain switched on for about 14 minutes, and will then switch off automatically. In case of need it may be reactivated by repeating the process.
2.4 Keeping the swivelling brackets (1) still loose, align the transmitter by careful swivelling and adjustment of the height, in such a way that the red beam of the adjustment laser falls more or less on the middle of the marked target on the upper adjustment template (5a).
2.5 Tighten the fastening screws of the swivelling bracket.

Note
When the transmitter is incorporated in a device column, it is possible by tightening the vertical socket screws (24) and loosening the hexagonal socket screws (27), while turning the device column horizontally, to align the laser beam to the upper target markings of column 1.

2.6 Place the template on the upper mirror of column 2.
2.7 Loosen the hexagonal socket screws (27) at the foot of column 1, and turn the column so as to align it to the next mirror column, until the laser beam falls on the centre of the template. Then tighten the three M8 screws of the anti-twist locking mechanism (27), exerting a pressure of 20 Nm.
2.8 Adjust the upper individual mirror (14) of column 1 by tightening the hexagonal socket screws (15) in such a way that the laser beam falls on the marked target of the upper template on column 2.

Note
Following the exact adjustment of the mirrors, a visual inspection should be carried out to ensure that all three mirror screws (15) are adjacent to the respective mirror plates of the UMC column. When the mirror plate is pressed down and subsequently released again, the adjustment should not undergo further change.

2.9 Place the template on the upper individual mirror of column 3.
2.10 Loosen the hexagonal socket screws (27) at the base of column 2, and turn column 2 until the laser beam falls on the centre of the template on column 3. Then tighten the screws.
2.11 Adjust the upper individual mirror (14) of column 2 by tightening the hexagonal socket screws (14) in such a way that the laser beam falls on the target markings of the upper template on column 3.
2.12 Loosen the hexagonal socket screws (27) at the base of column 3, and turn column 3 until the laser beam falls on the receiver centrally. Then tighten the screws.
2.13 Adjust the upper individual mirror of column 3 by tightening the hexagonal socket screws (15) in such a way that the laser beam falls on the target marking (cross) (12) on the receiver.

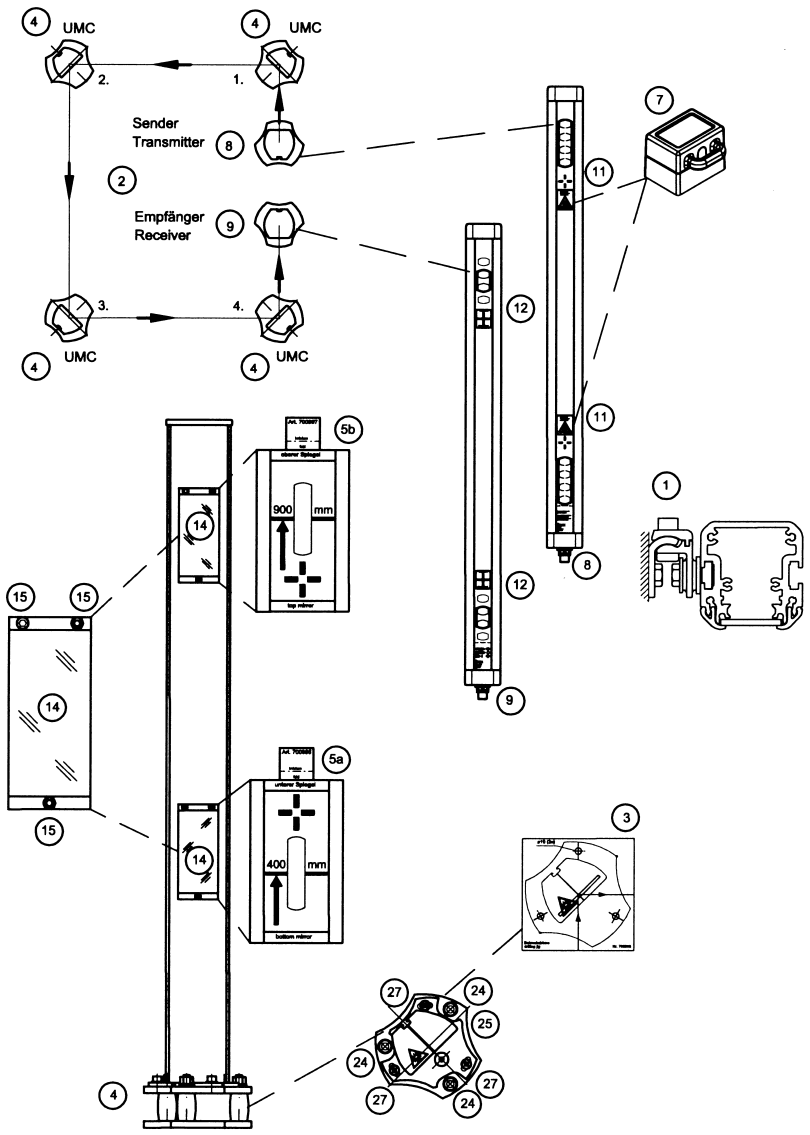
3. Adjustment of the lower light axis (independent of the upper setting)
3.1 Place the adjustment template (5b) (included in UMC-1002/LL standard delivery) on the lower individual mirror (14) of the mirror column adjacent to the transmitter (column 1).
3.2 Then proceed in the same way as for the alignment of the upper laser beam.

Note
Following the exact adjustment of the mirrors, a visual inspection should be carried out to ensure that all three mirror screws (15) are adjacent to the respective mirror plates of the UMC column. When the mirror plate is pressed down and subsequently released again, the adjustment should not undergo further change.

4. Alignment of the receiver
4.1 Keeping the swivelling brackets still loosened, turn the receiver (9) clockwise and counterclockwise until the correct alignment of the infra-red beam is finally reached. The green LED on the receiver will then light up. When the receiver is incorporated in a column component, the infra-red beam may be aligned in the same way by turning the column component slightly (by loosening the hexagonal socket screws (27)) in a clockwise and counterclockwise direction.
4.2 Then fix the swivelling brackets or the ring plate of the column component in place once more (by tightening the hexagonal socket screws (27)).

Note
To achieve an exact alignment of the infra-red beam, the swivelling brackets or device column should be turned carefully while observing the LED display (which will switch from RED ⇨ORANGE ⇨GREEN ⇨ORANGE ⇨RED), so as gradually to approach the cut-in zone (GREEN zone).

Drawing



Order Details

Components	Art. No.	Components	Art. No.
Mirror column UMC-1002/LL	549755	Receiver CR501L/2/A	589612
Transmitter CT501L/2/A	589512	Receiver CR501L/2/A in UDC 1000	905003
Transmitter CT501L/2/A in UDC 1000	905002	Swivelling brackets BT-SSD	560300
Transmitter CT500L/2/A	589513	Receiver CR500L/2/A	589613
Transmitter CT500L/2/A in UDC 1000	905004	Receiver CR500L/2/A in UDC 1000	905005