



MINIBAR SYSTEMS

# TECHNICAL MANUAL



**PRIMO**  
**30**  
**40**

**Minibar Enterprises AG**

Blegistrasse 9  
CH-6340 Baar  
tel +41 41 767 23 00  
tax +41 41 767 23 23  
info@minibar.ch  
www.minibar.ch

**Minibar North America, Inc.**

7340 Westmore Road  
Rockville, MD 20850  
tel +1 301 309 1100  
fax +1 301 309 1115  
info@minibarNA.com  
www.minibarNA.com

# Index

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<b>Chapter</b>		<b>Page</b>
<b>1</b>	How a silent chiller works	3
<b>2</b>	Fault finding chart	4
<b>3</b>	To change silent chiller	5
<b>4</b>	To change heater element	7
<b>5</b>	To change INTEA junction box	8
<b>6</b>	To change a sensor	9
<b>7</b>	Junction box / sensor diagnosis	11
<b>8</b>	To change door hinge from right to left	12
<b>9</b>	To mount door frames and laminate panel	13
<b>10</b>	To fit a door pull handle	14
<b>11</b>	Lock modification - latch plate, washers	14
<b>12</b>	To change an internal light bulb	15
<b>13</b>	To change a power cable	15

# 1

## How a silent chiller works

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Unlike the noisier compression cooling, absorption cooling has no moving parts and is run by a heating element powered by electricity. It is important to remember that the heat given off during the absorption and condensation processes must be dispersed into the surrounding air, and therefore the units require adequate ventilation space.

### Absorption technology

Even though the process is more complex, we will try in a simple way to explain how the system works. In order to do so, it is important to understand that there are 4 basic parts to an absorption cooling unit, these being:

- i. The reservoir-absorber
- ii. The boiler pump
- iii. The condenser
- iv. The evaporator (most commonly called the chiller)

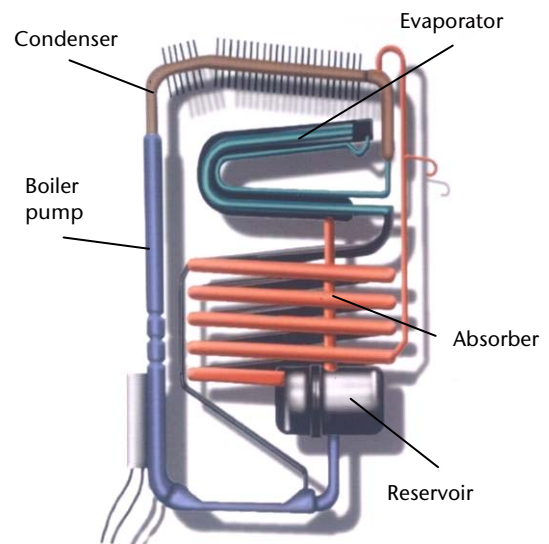
The system works within a sealed environment and with a solution made basically of water, ammonia and hydrogen.

The boiler pump electrically heats up and boils the water with a high concentration of ammonia, which comes from the reservoir, and that releases the ammonia now in a form of gas. The ammonia gas rises to the upper part of the system, called the condenser, where, with the help of the cooling fins, it causes the temperature to drop, thus condensing only the ammonia from gas to a liquid form.

This liquid and highly pure ammonia is then moved to the evaporator, where it meets with hydrogen at different pressure, causing the ammonia to evaporate again. It is a physical phenomenon that every time we have an evaporation there is a temperature absorption. In other words, the process pulls the heat from the surrounding area, consequently cooling the evaporator to a degree that frost is formed in the outer part of it, and the temperature in the inside of the Minibar is lowered.

The evaporated ammonia, together with the hydrogen, then travel to the absorber, where we have fairly pure water which, once it encounters the evaporated ammonia gas, it absorbs it. This process is what gives the system its name, since here water is absorbing ammonia. By gravity this water-ammonia solution travels through the absorber coil, absorbing as much ammonia as possible, and ending at the reservoir. Once in the reservoir, the water with a high content of ammonia passes again to the boiler pump, where a new cycle then starts.

Illustration 1: Absorption cooling unit



# 2

## Fault finding chart

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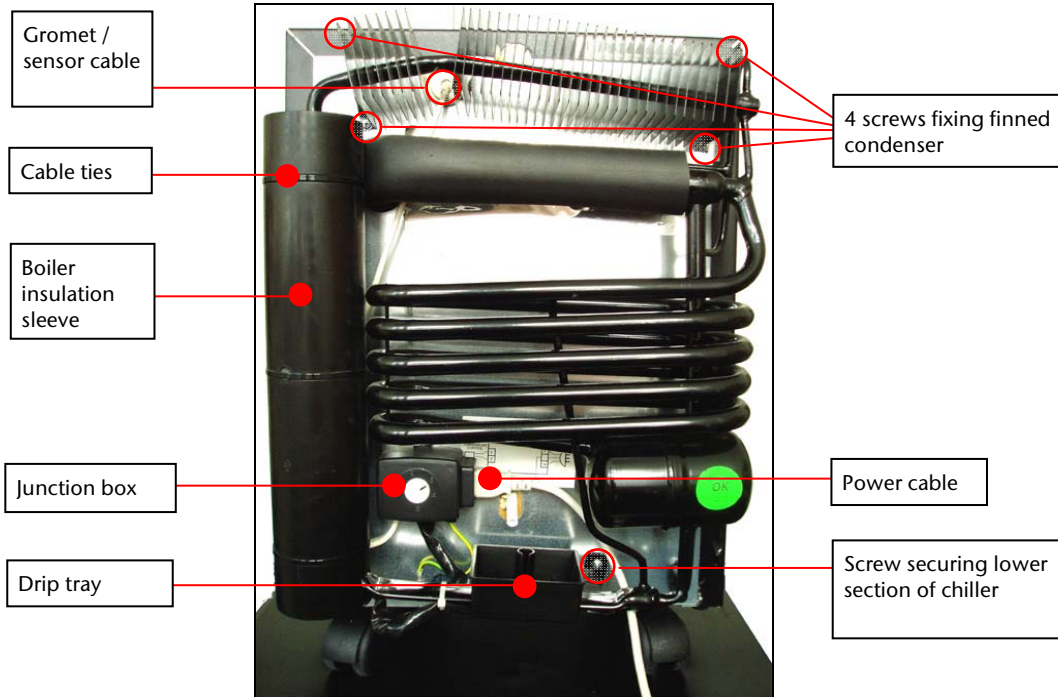
<b>? Problem</b>	<b>✓Check</b>	<b>☞Area</b>
Bar not cooling	Power to bar	Hotel power supply Connection to junction box
	Boiler hot/cold	If hot: Check thermostat setting to handbook If cold: a) Check heater resistance b) Thermostat function c) Timer not on defrost cycle
Overheating at rear of bar	Bar is level	Bar warm at rear but not cooling inside
	Ventilation correct	Bar overheating at rear
Ice build-up in bar	Thermostat setting	Products obstructing closing (door hinge screws loose)
	Door closing correctly	
	Condition of door seal	Damage will allow air entry

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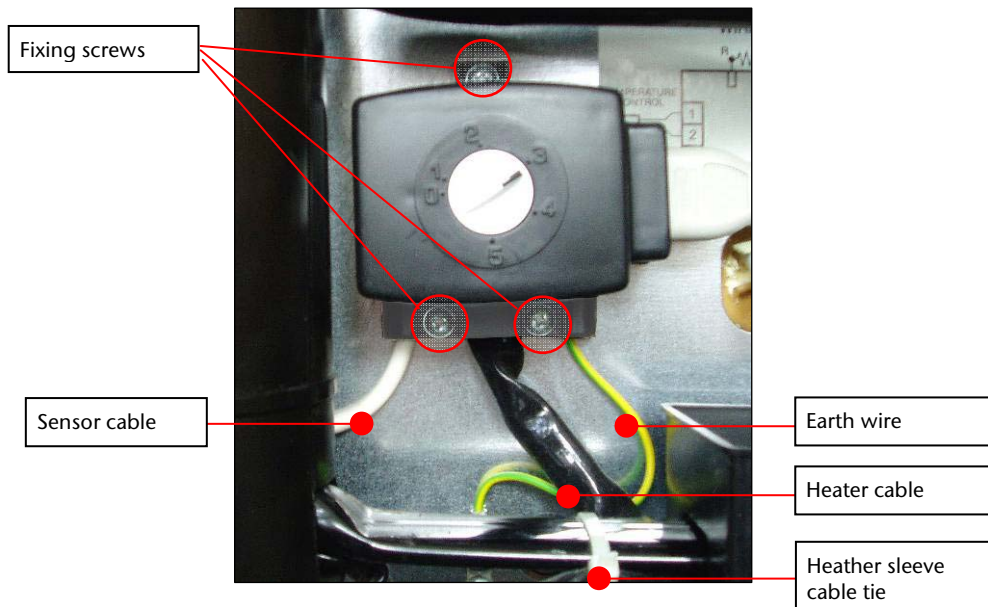
# 3

## To change silent chiller

**Rear view of minibar**



**Minibar junction box**



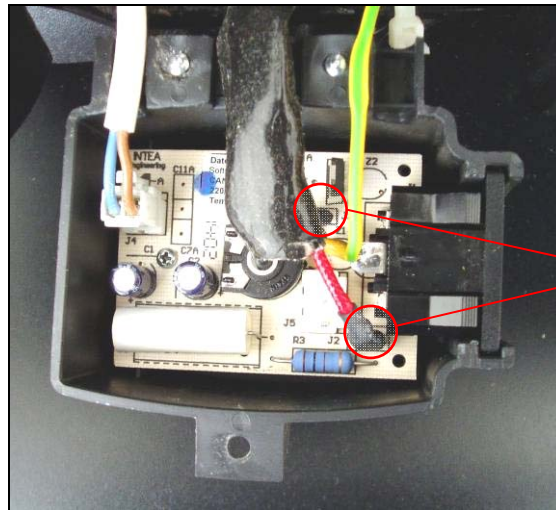
1. Place minibar with door down on flat clean surface
2. Remove power lead from junction box
3. Remove 3 screws securing junction box
4. Cut cable tie securing insulation sleeve to base of silent cooler
5. Carefully remove junction box from rear of minibar

# 3

## To change silent chiller (continued)

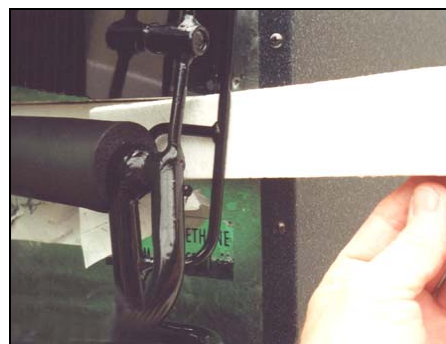
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### Inside of minibar junction box



Heater  
"Faston"  
connectors

6. Disconnect the 2 heater power cables – 2 x Faston connectors
7. Remove 4 screws fixing finned condenser section to rear of bar
8. Remove water drain reservoir at rear base of chiller
9. Remove screw securing lower section of chiller
10. Remove silver paper from rear of evaporator tube to expose styrene insulation.



11. Hold the end of condenser fins and gently pull chiller away from cold cube
12. When chiller is released from cold cube, remove styrene insulation from the rear of the evaporator tube
13. Remove chiller from the cold cube.

continued ...

# 3

## To change silent chiller (continued)

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### To re-mount the silent cooler:

14. Check that there is thermal mastic remaining in the bar aperture to create a thermal joint.
15. Re-mount the chiller to the cold cube – ensure evaporator tube is fully inserted into the thermal mastic and aluminium extrusion plate
16. Re-fix top 4 screws into the condenser fin supports.
17. Re-fix lower support screw. Take care to re-fix the earth cable
18. Re-connect heater wires, 2 Faston, to junction box terminals
19. Re-fix junction box, take care with position of cables
20. Secure insulation sleeve to lower part of chiller with cable tie
21. Re-connect power lead and test.

# 4

## To change heater element

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### Proceed as per Chapter 3, steps 1 - 6

1. Using a test meter check the resistance across the terminals
2. If open circuit proceed to change heater element as follows:



- i. Cut 3 cable ties securing boiler insulation sleeve
- ii. Using a screwdriver, carefully insert in joint of 2 sections of plastic housing, at the same time squeeze the area adjacent to the joint.
- iii. Remove the 2 sections of the plastic cover.

continued ...



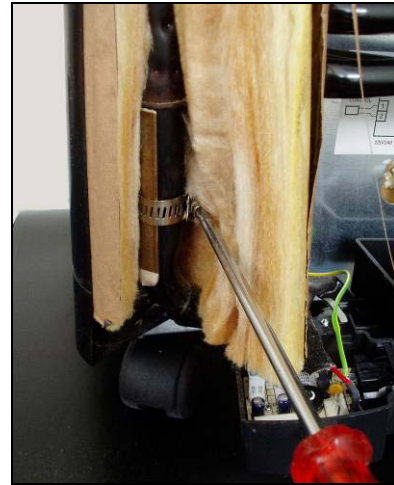
# 4

## To change heater element (continued)

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- iv. Using a sharp knife, cut the brown paper outer tape at the area of joint of insulation
- v. Remove the insulation sleeve



- vi. Use a flat-blade screwdriver to release the jubilee fixing clip on the heater.

(This can then be slid up the boiler tube and the heater removed)

### To re-mount new heater:

- 3. Prepare new heater by changing insulation sleeve for cables from old unit (if not supplied with new)
- 4. Locate heater to location ring on boiler tube, ensure area is clean before replacing
- 5. Re-position jubilee clip and re-tighten (correct torque)
- 6. Re-fit boiler insulation, using tape to re-seal
- 7. Re-fit boiler insulation plastic cover. Ensure free passage of cables
- 8. Fit new cable ties to secure boiler cover
- 9. Re-connect heater wires, 2 Faston, to junction box terminals
- 10. Re-fix junction box, take care with position of cables
- 11. Secure insulation sleeve to lower part of chiller with cable tie
- 12. Re-connect power lead and test.

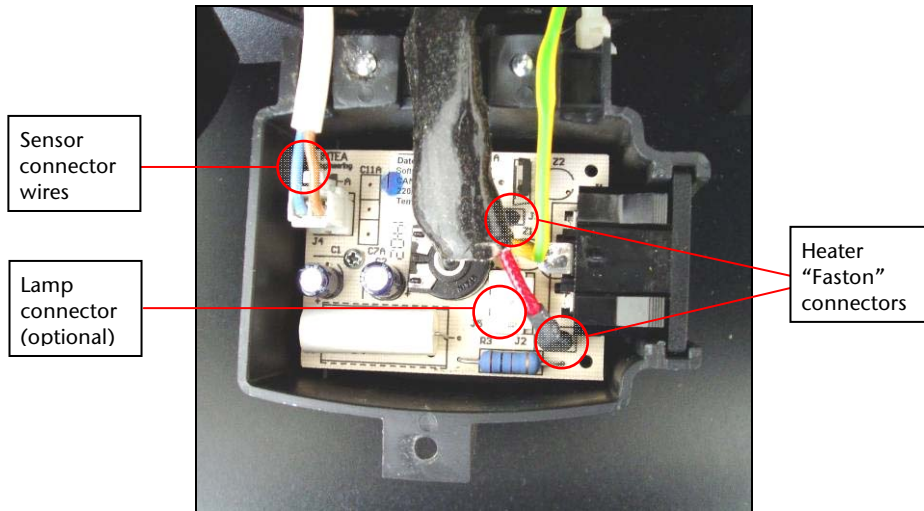


# 5

## To change INTEA junction box

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Proceed as per Chapter 3, steps 1 – 6



1. Remove sensor connector wires, the 2 x heater "Faston" connectors, and the light power cable, if fitted
2. Re-connect wires to the new junction box
3. Re-position the junction box on the rear of the minibar cabinet. TAKE CARE! Ensure that the cables run through the holes/slots to prevent trapping of cables
4. Re-connect power lead and check control is on position "3" as defined in the instruction manual.

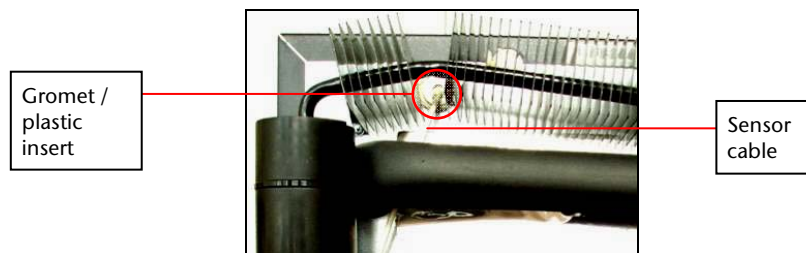
# 6

## To change a sensor

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To remove, proceed as per Chapter 3, steps 1 - 6:

1. Feed the cable up behind the chiller to the point where it enters the cold cube



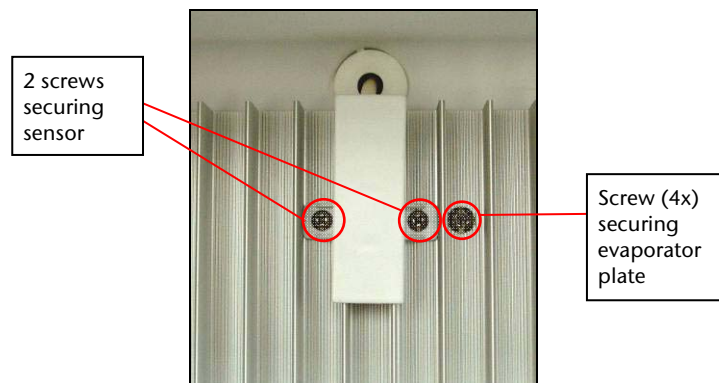
continued ...

# 6

## To change a sensor (continued)

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- Using a blunt screwdriver, carefully remove the plastic insert between the cable and cold cube. (This hole is filled with a sealer to maintain an airtight seal for the cold cube. Keep the sealer to re-use.)
- Open the minibar door and remove the 2 x screws securing the clamp to the evaporator plate. **TIP: Cover the defrost drain hole with tape to prevent screws falling in the tube**



- Remove internal plastic grommet covering hole
- Carefully pull through the cable from the interior, the socket with cable will pass the hole with care
- In some cases it is necessary to remove the evaporator plate (4 screws) to allow free passage of the cable.

### To replace:

- Feed the new cable plug/cable from inside the minibar
- Position ready to fix with the clamp
- Re-fit the internal plastic grommet and adjust cable length to give free movement
- Secure the sensor with the clamp and 2 x screws. **Remove tape from drain hole IF used!**
- Re-pack the space around the cable from the rear with the sealant putty and replace the rear grommet
- Feed the cable behind the chiller and re-connect socket to the junction box
- Re-fix junction box.

# 7

## Junction box / sensor diagnosis

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Built into the software of the Intea junction box there is a diagnostic mode. This mode can detect if there is a sensor fault or internal component fault in the junction box.

With setting **3 on the junction box**, the test procedure is as follows.

### **A) Sensor**

If the sensor is faulty the JB will supply power to the heater in the following sequence: 60 seconds ON / 12 seconds OFF

### **B) Junction Box**

If there is a failure of component within the JB the power supply to the heater is in the following sequence: 80 seconds ON / 16 seconds OFF

### **Test method**

The above tests require that power is applied to the JB. The suggested procedure is as follows:

1. Remove the power cable from the JB
2. De-mount the JB from the rear of the Minibar
3. Disconnect the wires to the heater/resistance
4. Connect a test lamp 60W bulb and lead with Faston connectors to the heater terminals on the JB. Check bulb voltage corresponds to JB voltage. Re-fix the JB to the Minibar.
5. Connect the power lead
6. Turn on power and check the lamp function to identify a condition as per A) or B) above.
7. If a volt meter is available, the voltage across the terminals of the lamp can also be measured to check function. To facilitate this a block connector should be installed in the cable between the lamp holder and the Faston connectors.

# 8

## To change door hinge from right to left

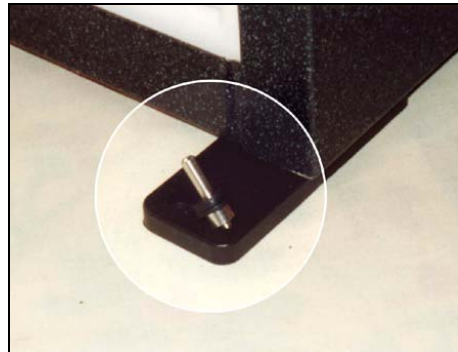
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1. With the door closed, remove the 2 screws fixing the top hinge



2. Pull the top of the door away from the minibar to slide the top hinge out of the slot.

3. Lift door to release from the bottom hinge pin. Take care not to lose the 3 washers and the pin.



4. Place the door aside.
5. Remove the 2 screws securing the hinge blanking plate to the left hand hinge hole.
6. With a sharp point, push out the hinge blanking plate and insert into the right hand hinge hole.
7. Re-fix with the 2 screws.
8. Remove the bottom hinge pin and washers from the right hand bottom hinge.
9. Place bottom hinge pin and washers into outer hole in the left hand bottom hinge.
10. Locate left hand door hinge hole on to bottom hinge pin.
11. Fit top hinge pin and plate to left hand top hinge hole on door.
12. Slide top hinge plate into left hand hinge slot.
13. Close door and locate screw holes in hinge plate.
14. Re-fix the 2 screws into the top hinge plate.
15. Check door for correct operation.

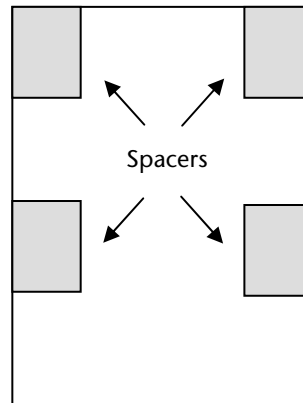
# 9

## To mount door frames and laminate panel

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1. Prepare some pieces of laminate of the same thickness, to use as spacers during assembly
2. Glue the top and both sides of the door with "Bostik" and leave for 10 minutes to allow the solvent to evaporate. **Be careful to put the glue only where the frame touches, so that there is no glue showing on the gasket. It is not necessary to glue the frames.**

3. Place the door on a clean, flat surface, and fit the spacer as per drawing.



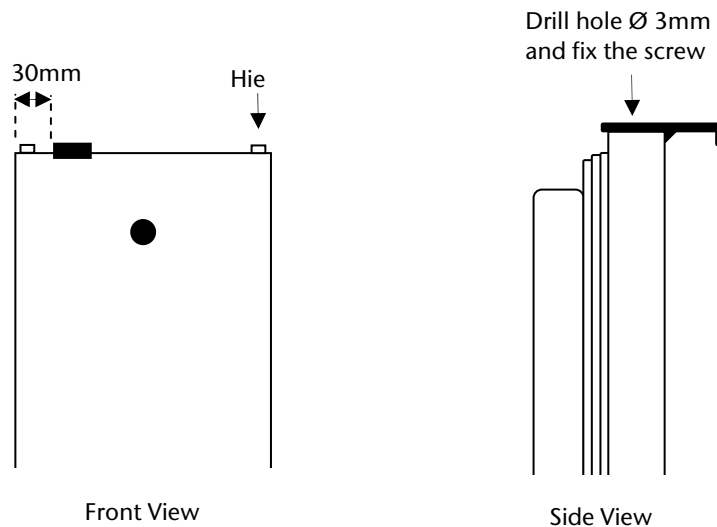
4. Ensure that on the top corners the laminate is well under the frames.
5. Fit the frames, firstly the top, then each side. Ensure that the side frame is well inside the top, if not, push from the bottom.
6. Secure the frames to the door with elastic bands as per drawing.
7. Drill holes into the door with a 3mm drill, 5mm hole if rivet to be used, use frames as template.
8. Fix the frames with the screws, Ø 4.2 x 16 self-tapping screws (black plated with Phillips head). If "Pop" rivet to be used, fit with 5mm rivets.
9. Remove the elastic bands and the spacers. Insert the laminate from the bottom of the door until it touches the top frame.
10. Fit the bottom frame, drill the door and fix with the screws as above.

# 10 To fit a door pull handle

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The door pull is mounted on the top edge of the Primo door.

1. Mark the position of the handle as per the drawing, 30 mm from the edge of the door.
2. Drill 3 mm hole, place handle in position and tighten screw.  
Screw: **Self tapping Ø 4.2 x 9 or 12, black (the handle is black)**



# 11 Lock modification - latch plate, washers

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If there is a problem with the lock (Indicator) not securely holding the door closed:

1. Ensure that the bar is fixed into the furniture to prevent lower hinge from binding.
2. As a further precaution it has been found that 2 other factors can be adjusted:
  - i. Remove the bottom hinge and insert extra washer(s) on the lower hinge pin.  
Some early production had a very brittle washer which can split. If this is found, replace the washer with a nylon washer. By adding/removing washers it is usually possible to adjust out the free-play in the door/lock location.
  - ii. If washers cannot solve the problem, remove the lock latch plate, insert a second latch plate (available from Ghisalpa as per the drawing).  
Re-fix the existing latch plate and then adjust the washers to obtain the required results.

## 12 To change an internal light bulb

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1. Disconnect the power to the minibar
2. Open the minibar door
3. Push up the clear plastic cover of the lamp to release the 2 lower clips
4. Pull away the lower edge of the cover and spring out the 2 upper clips
5. Unscrew the lamp bulb. Replace with new. **MAKE SURE YOU HAVE THE CORRECT VOLTAGE!**
6. Push the lamp cover back in place

## 13 To change a power cable

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The Primo minibar has a de-mountable power cable using a similar IEC connector as used in most computers. It is possible to change the lead to meet local needs in USA, Europe (Schucco), Denmark, Switzerland, UK.

The cable is fixed in place using the cable clamp supplied. It is recommended that this is used to prevent accidental removal of the cord if it is pulled.

The power cable can be simply plugged/unplugged from the socket in the junction box and replaced with the required item.