## fns3400D(X, A)/U Dimming Sensor Kit

The fns3400D(X, A)/U sensor kit plugs directly into any of the eZeBox range of connection units or a 7-pole single socket outlet to provide control of the connected mains rated luminaires. Control is ON/OFF/DIM, dependent on occupancy and or light level detection.
The kit comprises a controller, sensor head, and sensor lead.

Three products are available:
fns3400D/U for DSI digital dimmable ballasts.
fns3400X/U for DALI digital dimmable ballasts.
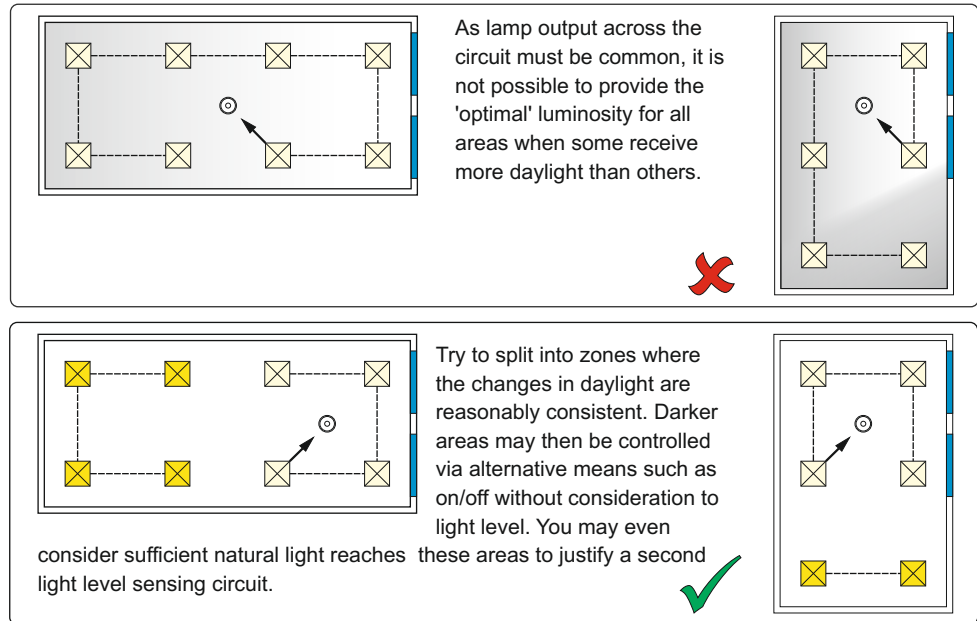fns3400A/U for Analogue ballasts 0-10V.

Please ensure the correct product is selected for the type of ballast being used as incorrect connection may damage the controller.

This product should only be installed by a qualified electrician.

eZeBox connection unit
(not included)

Controller

Sensor lead

Sensor head

Switch drop lead

Switch
(not included)
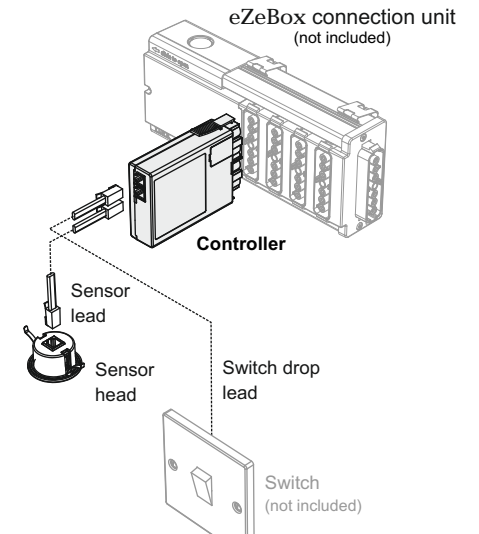
Light level detection performance

The fnh400 sensor head detects both occupancy and light level. However, conditions for optimum light sensing should always have priority over those for occupancy coverage. To achieve effective daylight linking control, select only an area where the daylight contribution, though changeable, is significant and remains consistent across the area.

As lamp output across the circuit must be common, it is not possible to provide the 'optimal' luminosity for all areas when some receive more daylight than others.

Try to split into zones where the changes in daylight are reasonably consistent. Darker areas may then be controlled via alternative means such as on/off without consideration to light level. You may even consider sufficient natural light reaches these areas to justify a second light level sensing circuit.

Note: Always fit the sensor head as close as possible to the centre of the group of lights under its control. Do not site where the sensor head could receive direct sunlight.

Configuring the controller and wiring the connection unit

Prise open lid '**C**' using a screw driver. Position link as required.
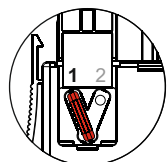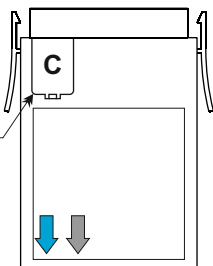
Link in position 1
Lights can remain ON during an emergency test. Wire connection unit as shown on page 6.
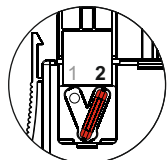
Link in position 2
Lights will switch OFF during an emergency test. Wire connection unit as shown on page 6.

Rating
Supply Voltage   : 230V~ 50Hz
Load
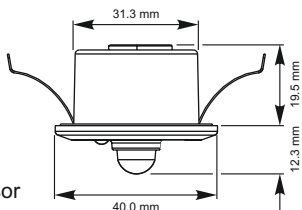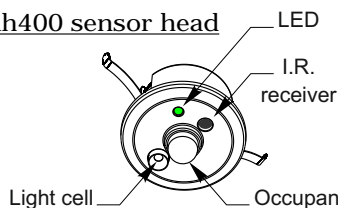Fluorescent & Incandescent Lighting   : 6A
Compact Fluorescent Lighting   : 3A

Maximum number of Ballast
fnc3000D/U (DSI Digital control)   : 25
fnc3000D/U (DALI Digital control)   : 25
fnc3000D/U (Analogue 0-10V control)   : 25

Sensor head and occupancy detection performance

Fnh400 sensor head — LED
I.R. receiver
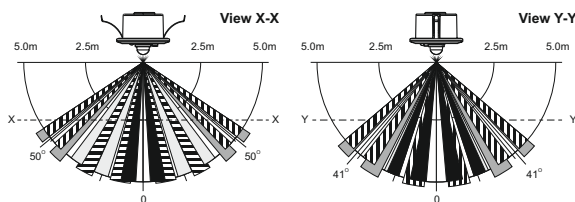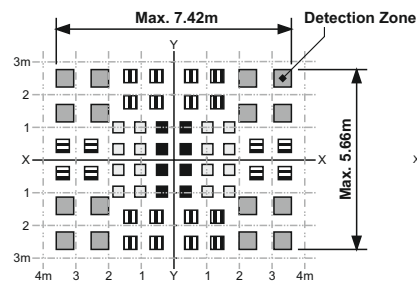Light cell
Occupancy sensor

31.3 mm
19.5 mm
12.3 mm
40.0 mm

The sensor head fits into a 32mm diameter hole, with clips which can grip ceiling panels down to 1.5mm thick.

The sensor head has a rectangular occupancy detection range broadly 7.4m x 5.6m at a ceiling height of 2.5m (Longest length of detection aligning with the spring clips). As the ceiling height increases so will the overall detection area but sensitivity to small movements will decrease.
**Note:** Make sure that the sensor is not adjacent to circulating air, heaters or lamps.

Detection Zone

Max. 7.42m
Detection Zone
Max. 5.66m
3m 2 1 X 1 2 3m
4m 3 2 1 Y 1 2 3 4m

View X-X
5.0m 2.5m 2.5m 5.0m
50° 50°
0

View Y-Y
5.0m 2.5m 2.5m 5.0m
41° 41°
0

The X-Y cross-sectional diagram shows the detection area. The differences in the detection zone patterns indicate the projections of the 16 lenses with a single focal point. Movement of an object with higher than background temperature, between the detection zones, will be detected.

Setting up your sensor
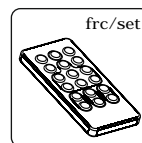
frc/set

Setup Remote Control - frc/set
Your sensor comes factory set with a 20 minute occupancy time out, however you will require an frc/set remote control (ordered separately) to set up daylight linking. You may also require one if another time out period is required (2,5,10,20 and 40 minutes) or other operational options are desired. Full instruction for setting up the sensor are supplied with the frc/set remote control.
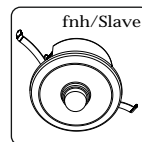
Optional Extras/Spares
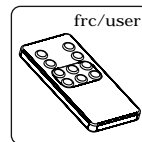
frc/user

User Remote Control - frc/user
The frc/user remote control is a convenient method for the user to control the lighting remotely. Lights can be temporarily overridden ON or OFF dimmed UP or DOWN. In addition, up to six preset light levels can be stored and recalled.
Note: Unlike the frc/set remote control the frc/user remote control can not be used to setup or change occupancy time-out settings.

fnh/Slave

Increasing Occupancy Coverage - fnh/slave
Occupancy coverage can be increased by adding up to a maximum of five slave sensor heads (fnh/slave) to your existing sensor head. The fnh/slave comes complete with a 'Y' adaptor to facilitate connection.
A connecting lead may also be required, part number fslXX (XX = length /5m).

Fsl- -

Increasing Occupancy Coverage - fnh/slave
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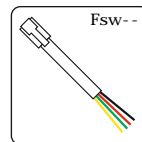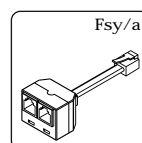A connecting lead may also be required, part number fslXX (XX = length /5m).

Fsw- -
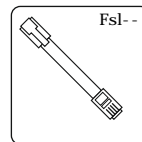
PELV - **Switch Drop**
To add additional switches a PELV switch drop lead and a fsy/a will be required to connect the additional switch to the control unit.

Fsy/a

Fsy/a
If your room requires additional sensor heads (fnh/slave) or additional switch drops you will require an fsy/a to link your additional cables into.
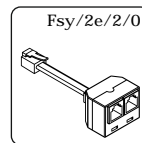
Fsy/2e/2/0

Fsy/2e/2/o
If your room requires 2-way switching you will require in addition:
1 x fsy/2e/2/0 - 'Y' adaptor for 2 x 2-way.
1 x fswXX - Switch drop lead.
(XX = length in metres in multiples of 5m).

Left panel (page 6)

Wiring Option B

Em/L
Neutral
Earth

E
1 2 3 E 4 5 6

Wiring Option A

Aux/L
Em/L
Neutral
Earth

E
1 2 3 E 4 5 6

See page 2 for details on configuring link

Dim
R1
2°

(Connection unit shown) fsu06

Emergency luminaire

*
(Orange)
(White)
(Brown)
(Grn/Yel)
(Blue)
(Black)

Luminaire

*
(Orange)
(White)
(Brown)
(Grn/Yel)
(Blue)

D1/10V D2/0V Sw/L Earth Neutral Em/L Aux/L
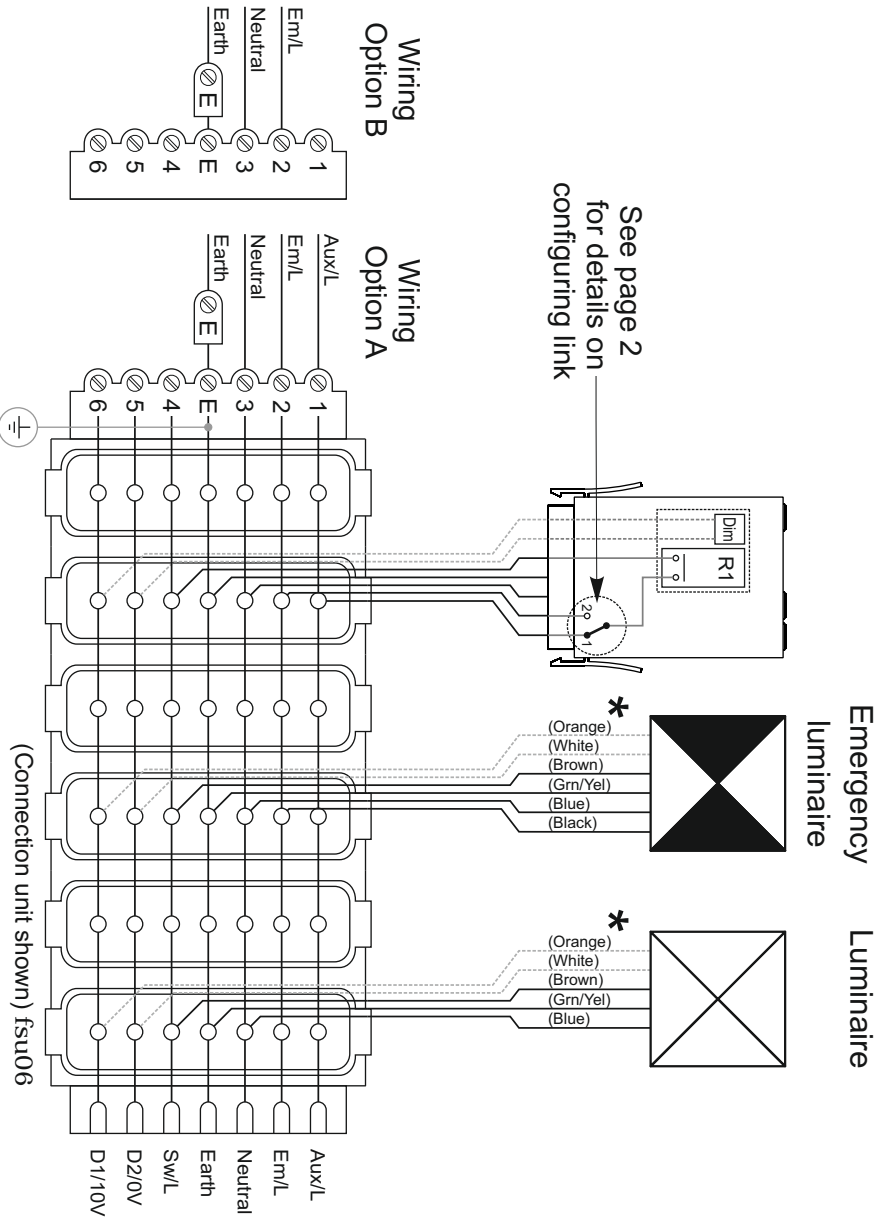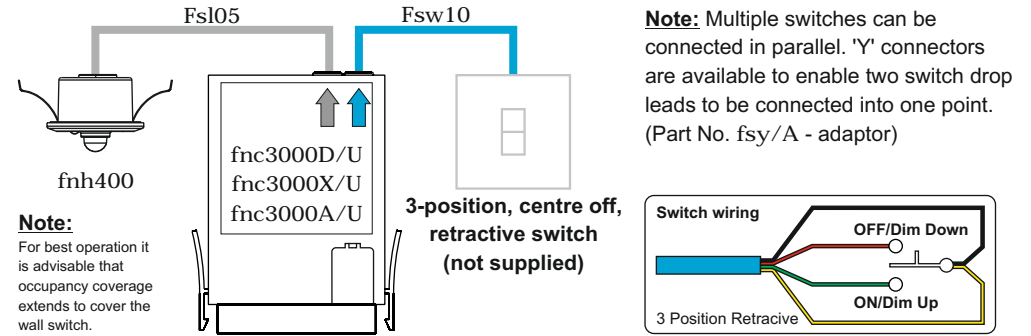
6

Right panel (page 3)

Absence + Manual dimming using a 3-position retractive Switch

Fsl05   Fsw10

fnh400

fnc3000D/U
fnc3000X/U
fnc3000A/U

3-position, centre off, retractive switch (not supplied)

Note: Multiple switches can be connected in parallel. 'Y' connectors are available to enable two switch drop leads to be connected into one point. (Part No. fsy/A - adaptor)

Note:
For best operation it is advisable that occupancy coverage extends to cover the wall switch.

Switch wiring

OFF/Dim Down

ON/Dim Up

3 Position Retracive

Operation:

Switch control:
ON pulse   - turns the lights ON with *daylight linking* activated.
OFF pulse - turns the lights OFF.
A long ON pulse   - brightens lights (eventually to maximum & *daylight linking* will be deactivated).
A long OFF pulse - dims lights (eventually to minimum &*daylight linking* will be deactivated, but should the pulse exceed 15 secs the lights will switch OFF completely).
Absence detection: When occupancy is no longer detected, lights will switch OFF after a pre-selected *time-out* period (default 20 minutes).
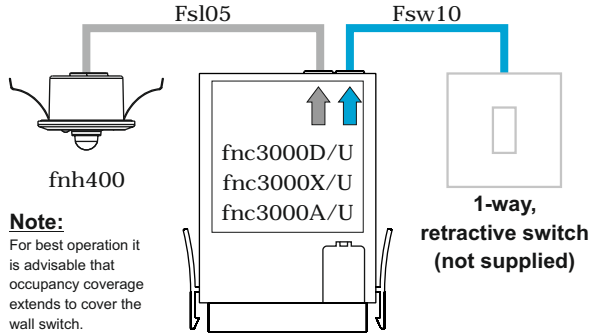**Daylight linking:** Provided *daylight linking* is activated (see switch control above) the light output will adjust to compensate for any changes in ambient light in order to maintain a constant light level under the sensor head - the *target level*.

Note: Alternative operational options not necessarily shown above are available using the frc/set setup remote control.
Full instructions for setting up the sensor are supplied with the sensor head and the frc/set remote control - both ordered separately.

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Absence + Manual dimming using a 1-way Retractive Switch

Fsl05   Fsw10

fnh400

fnc3000D/U
fnc3000X/U
fnc3000A/U

1-way, retractive switch (not supplied)

Note: For best operation it is advisable that occupancy coverage extends to cover the wall switch.

Note: Multiple switches can be connected in parallel. 'Y' connectors are available to enable two switch drop leads to be connected into one point. (Part No. fsy/A - adaptor)

Switch wiring

Toggle/Dim

Operation:

Switch control:

Pulse - turns the lights ON or OFF with *daylight linking* activated if turning ON.
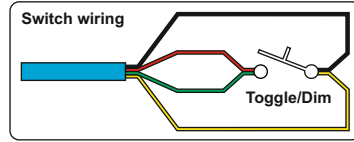
Long pulse - Alternates from brightening the light to dimming the light with each consecutive long pulse, deactivates *daylight linking*, (but should the pulse exceed 15 secs the lights will switch OFF completely).

Absence detection: When occupancy is no longer detected, lights will switch OFF after a pre-selected *time-out* period (default 20 minutes).

Daylight linking: Provided *daylight linking* is activated (see switch control above) the light output will adjust to compensate for any changes in ambient light in order to maintain a constant light level under the sensor head - the *target level*.
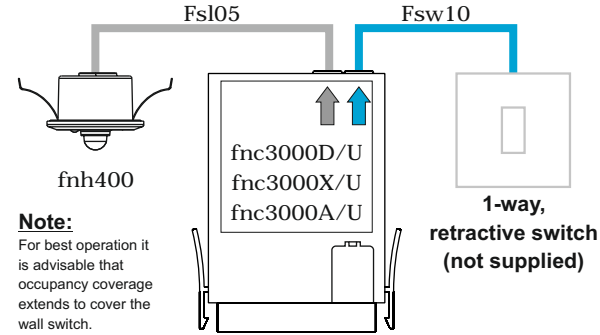
Note: Alternative operational options not necessarily shown above are available using the frc/set setup remote control.

Full instructions for setting up the sensor are supplied with the sensor head and the frc/set remote control - both ordered separately.

Occupancy with override Switching

Fsl05   Fsw10

fnh400

fnc3000D/U
fnc3000X/U
fnc3000A/U

1-way, retractive switch (not supplied)

Note: For best operation it is advisable that occupancy coverage extends to cover the wall switch.

Note: If your room requires 2-way switching, a special 'Y' connector is available to enable two switch drop leads to be connected. (Part No. fsy/2e/2 - OFF control from 2 x 2-way switches)

Switch wiring

Sensor

Override OFF

Cut back & insulate unwanted cores.

### Operation:

Switch control:

Override OFF - turns the lights OFF (takes priority over sensing).

Occupancy detection: Provided the wall switch is in the 'Sensor' position the lights will switch ON with *daylight linking* activated, whenever there is occupancy detected by the sensor head. When occupancy is no longer detected, lights will switch OFF after a pre-selected *time-out* period (default 20 minutes).

Daylight linking: While lights are ON due to occupancy their light output will adjust to compensate for any changes in ambient light in order to maintain a constant light level under the sensor head - the *target level*.

Note: Alternative operational options not necessarily shown above are available using the frc/set setup remote control.

Full instructions for setting up the sensor are supplied with the sensor head and the frc/set remote control - both ordered separately.
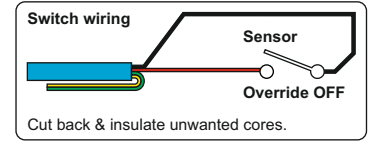
Other switching options incorporating override ON

Note:

You may not be able to claim enhanced capital allowances under the Carbon Trust scheme if you incorporate local 'override ON' switches in your occupancy sensor scheme.

Latched Option

Sensor

Override ON

Cut back & insulate unwanted cores.

or

Latched Option

Override OFF

Override ON

Cut back & insulate unwanted cores.