

# Memo

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**To :** All CIS customers within Australia & NZ    **Date:** 07-06-2004

**Subject :** "Table: Recommended Maximum Quantities of electronic transformers on specific Clipsal dimmers."

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If you are not aware of the table, its purpose is "to list various Clipsal Integrated Systems Leading Edge type Dimmers and the recommended maximum quantities of electronic transformers that can be connected to them." The table is not applicable to the dimmers, 32E450TM, 32E500FM, 31E800T.

## Listed Transformers:

The transformers listed on the table have previously been submitted by either the manufacturer or in most cases by the contractors / installers who are using that particular transformer.

Based upon the capacitance loading and the V.A. rating of the transformer we have then calculated the recommended maximum quantity of transformers that should be connected to our dimmers. We have in the past, inspected transformers, to determine the capacitance (nF) loading of the transformers. We wish to advise that we no longer provide this inspection service.

## Supply of Formulas:

To give an installer the ability to work out how many electronic transformers can be fitted to a Clipsal dimmer, we have documented the process / formulas that we use for the dimmer calculations.

With the correct use of the supplied formulas, an installer will then be able to perform the calculations based upon your preferred transformer.

The two required values from the transformer are:

- V.A rating
- Capacitance loading

## V.A. Rating:

The Maximum V.A rating of the transformer is typically printed on the casing of the transformer itself, so obtaining this should pose no problem. Note that we are referring to the maximum V.A of the transformer itself, *not the V.A. rating of any lamp or lamps attached to the transformer.*

## Capacitance Loading Value:

A higher value of capacitance ( typically > 100nF ) on a transformer will present a higher loading to any "Leading Edge" dimmer controlling it, hence, the lower the capacitance, the better. Not all transformers exhibit a capacitance loading effect. In most cases a capacitor is used to ensure compliance with EMC standards. This in itself causes much of the capacitive loading effect. "Trailing Edge" design dimmers do not suffer from capacitance loading.

The capacitance value will rarely be listed on the unit itself but may possibly be documented in its instructions. If the capacitance value is not displayed, the installer will then be required to source this value from where they purchased the transformer.

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## **FORMULAS**

### **1/ Standard Series, Leading Edge, High Power Dimmers, 32/1000 & 32/2400**

STEP 1:

$$A = \frac{(\text{Transformer}) \text{ V.A.}}{(\text{Transformer}) \text{ nF}}$$

If this value is less than "0.85", then the transformer is deemed as not recommended, ( N R ) due to its high capacitive loading in comparison to its V.A. output.

If this value is greater than "0.85", then the transformer is deemed to have an acceptable Capacitance to V.A ratio.

Based upon an acceptable result in "Step 1", the following formula would then be used:

STEP 2:

$$\text{"X" (Rounded Down)} = \frac{(\text{Dimmer Channel}) \text{ Maximum V.A.}}{(\text{Transformer}) \text{ V.A.}}$$

*X = "the recommended maximum quantity of electronic transformers to be connected to that dimmer channel."*

#### **Note:**

Whilst an electronic transformer may be listed as "not recommended" on the CIS Table; "*Recommended Maximum Quantities of electronic transformers on specific dimmers*", there is a possibility that it may still be used, however, there is a limitation.

The limitation is that the dimmed circuit will need to be divided into parallel sub-circuits of 400 V.A. or less. Each of these sub-circuits would then require 1 of the 32EIND inductors connected into it.

The 32EIND is a Clipsal product and can be ordered from normal distribution channels such as Electrical Wholesalers.

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## 2/ C-Bus Leading Edge dimmer formula for number of electronic transformers

The appropriate maximum “Capacitance and V.A” loadings for C-Bus Dimmers are listed in a table on the last page of this document.

**Note:** All 3 of the following steps must be completed in order to obtain the correct recommended quantity of electronic transformers.

**STEP 1:** “Value A” - the “maximum quantity of transformers based upon the transformers individual nF loading on the dimmer channel”.

$$\text{“Value A” (Rounded down)} = \frac{\text{Dimmer Channel Maximum Capacitance “nF”}}{\text{Individual Transformer “nF”}}$$

**STEP 2:** “Value B” - the “max quantity of transformers based upon the transformers individual V.A Loading on the dimmer channel”.

$$\text{“Value B” (Rounded Down)} = \frac{\text{Dimmer Channel Maximum “V.A.”}}{\text{Individual Transformer “V.A.”}}$$

**STEP 3:**

Values “A” & “B” are then compared, *the lesser value is then used as “X”.*

**Where**

**X** = *“the recommended maximum quantity of electronic transformers to be connected to that dimmer channel.”*

Example: Step 1 -  $\frac{\text{Din Dimmer (300nf)}}{\text{transformer ( 100nf )}} = 3$

Step 2 -  $\frac{\text{Din Dimmer ( 240VA )}}{\text{transformer ( 60VA )}} = 4$

Step 3 - Compare “Step 1 Value = 3”  
“Step 2 Value = 4”.

Result: The lower value of “3” is used for how many transformers are “recommended”.

The maximum “Capacitance and V.A” loadings for C-Bus Dimmers are listed in a table on the last page of this document or alternatively available from the Clipsal Integrated systems Website.

Relevant details of C-Bus Leading Edge dimmers.

C-Bus Leading Edge Dimmers				
	Part Number	Number of channels	Maximum nF per channel	Maximum V.A. per channel
DIN	L5508D1A	8	300	240
	L5504D2A	4	300	480
OLD	5104D750	4	300	750
PRO	L5104D5	4	1000	1200
	L5102D10	2	1000	2400
	L5101D20	1	1000	4800

**Note relating to the previously mentioned document**

*Document titled "Table: Recommended Maximum Quantities of Electronic transformers on specific Clipsal dimmers".*

High Power Dimmers & C-Bus Dimmers

Various transformers on the table may be listed as "N C" or "not compatible" in some of the columns. This is typically due to the manufacturer stating that the transformer is only suitable for "TRAILING EDGE" type dimmers.

Any detail on this trailing edge dimming control requirement has either been printed on the product itself or written in the manufacturers instructions supplied with the product.

High Power Dimmers only

Various transformers on the table may be listed as "N.R" or "not recommended", this is due to the ratio of transformer V.A. to the transformers capacitance. For further detail please refer back to page 2 of this document.

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