

Electrical Design Team Guidance Notes

GN31

Pedestrian Countdown at Traffic Signals

**Contains information
for
Site installation Staff.**

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Background

In order to facilitate crossing of pedestrians and perhaps gain some time for other purposes, a pedestrian timer can be installed. The countdown timer will show remaining crossing time in seconds available to the pedestrian to allow them to decide whether to cross or not. This system in TfL is known as Pedestrian Countdown at Traffic Signals or PCaTS.

This guidance note is based on the technical instruction ***The Retrofit Installation of Pedestrian Countdown at Traffic Signals. Issue 02a***

Introduction

The PCaTS countdown timer requires a connection to both the LV signal wiring and the ELV ancillary wiring. The countdown signal may require some additional kit depending on the power supply used to allow it to work with a dim voltage of 160volts.

LV signal connections

The PCaTS is a self learning unit and to “learn” it requires connections to the REDMAN and the GREENMAN. These connections (blue, grey and brown in the PCaTS lead) are made by connection in to the neutral, Redman and Greenman connections found at the termination point for the traffic signal(s). This may be the pole top terminations or other terminations if a combined column, wide-base pole or the like.

ELV ancillary connections

The PCaTS countdown timer operates from 48v d.c. drawing approx. 0.5amp each. Therefore several PCaTS signals will use the same power supply connections, 0 volt and 48 volt. The connection information will be given in the electrical design connection schedules (ELV tagging sheet). The 48v d.c. is derived from a DIN rail mounted PSU installed in the traffic signal controller.

The PCaTS signal has a monitoring facility. Two connections are required for this;

- 1) Detect common (Det Comm) and 2) a monitoring connection. These go to the I/O card within the controller. Where two or more PCaTS are installed they all connect to the Det Comm and then each monitoring connection is wired back separately to the I/O card for monitoring.

48v d.c. PSU (voltage tolerant)

The power for the PCaTS is derived from a 48volt PSU (RS 428-411). The unit has its own protection and therefore fusing of the out going circuits is not required. The 0v needs to be connected to the I/O card common. The PSU is able to function on an input voltage ranging from 100v to 240v and is therefore able to be driven directly from the switch sign phase even though the controller may use dimming voltage (160v) at night.

An isolator is provided for *functional switching* to allow the PCaTS to be turned off independently of the traffic signals. See wiring diagram.

Test the output of the PSU checking the 48 volts is correct and not affected by dimming operation of the controller.

48v d.c. PSU plus Non-Dim kit

If the 48v PSU is not tolerant of a change of input voltage to 160v then it may need to be supplied with 230 volt. This is derived from either the Regulatory/Box sign or Ancillary fuse (5amp) and is switched by a solid-state relay (RS 736-0829) providing it is enabled by the switch sign phase from the lamp switch card.

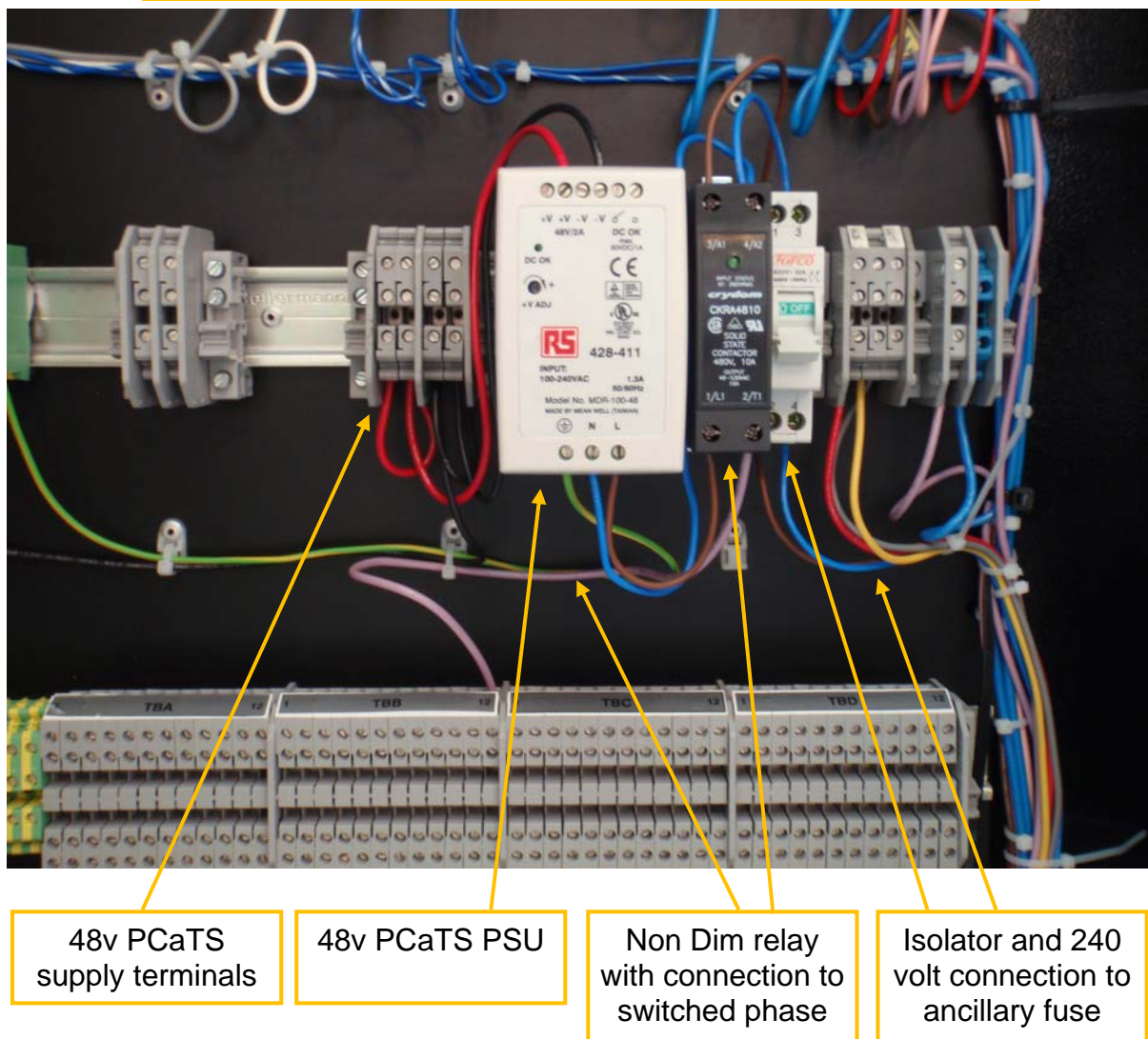
An isolator is provided for *functional switching* to allow the PCaTS to be turned off independently of the traffic signals. See wiring diagram.

Test the output of the PSU checking the 48 volts is correct and not affected by dimming operation of the controller.

Each 48v d.c. PSU is rated at 2amp and should be capable of operating up to eight PCaTS units.

If a site has 9 or more PCaTS units then a second 48v d.c. PSU shall be fitted. This may be wired into the same 230v supply by looping from adjacent PSU and a separate group of 48volt terminals provided. The electrical design will mark the 48v connections 48-1 or 48-2 to indicated PSU 1 or PSU 2.

Typical installation showing 48v PSU, non-Dim relay and isolator



Wiring the Supply for 48 volt PSU

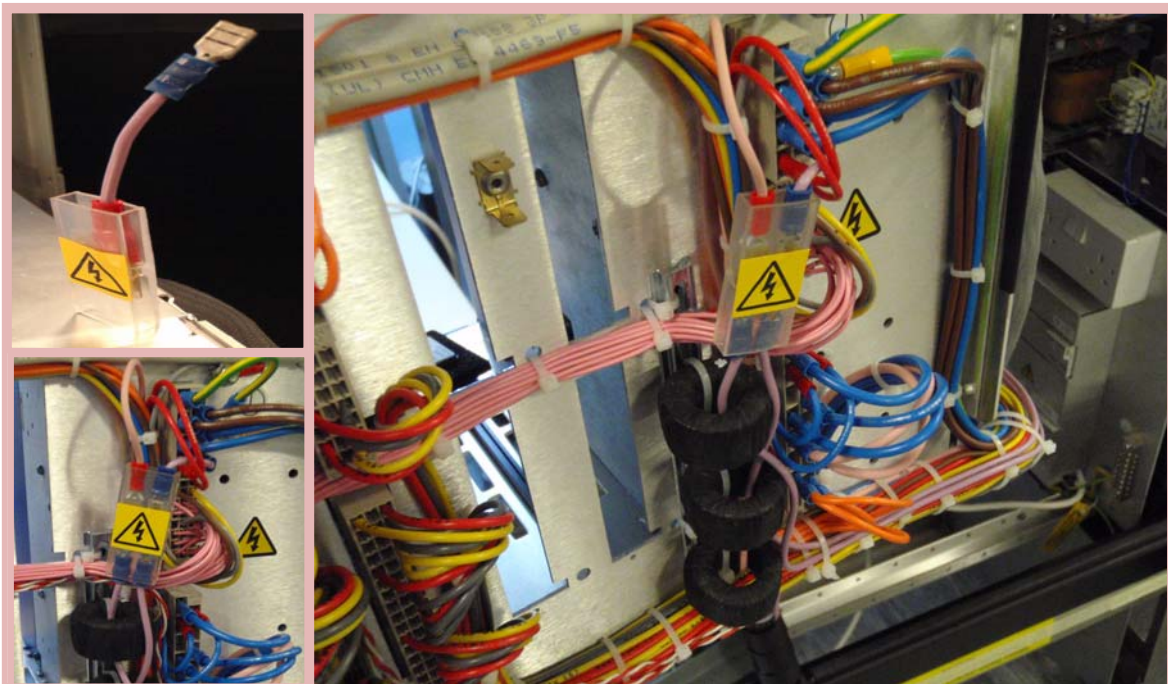
Using Regulatory fuse supply

A 230volt supply to the 48volt PSU may be taken from the Regulatory box sign circuit. This will need to be made before the monitoring toroid for the Reg sign otherwise faults will be logged by the controller. See wiring diagram.

Adding Additional wiring to the Box sign circuit

The Reg/box sign circuit is the pink wire from the back of the Mains distribution Unit. The pink wire is connected to the MDU connector 22 in ST900 LV controller. Other controllers may vary. This wire needs to split in to two and this may be done by using a fully insulated 6.4mm spade connection module (i.e. RS 510-4747) and a short length of 1.0mm tri-rated equipment wire (i.e. RS 724-4165). The original pink wire may be reconnected to the insulated connector. The supply to the PCaTS 48volt PSU may be added by running additional PINK 1.0mm² i.e. RS 724-4165 or similar tri-rated equipment wire added to the wiring loom and routed to the PSU. Take care to run the wire inside any protective wrapping.

.Add a small 18mm x 20mm warning flash to insulated connector cut from label such as RS No 556-159 or similar.



The Neutral connection is made at the appropriate neutral terminals for the Reg signs.

Ancillary fuse

It may be desirable to power the PCaTS's 48volt PSU from the ancillary fuse in the controller. A 5amp or 6 amp fuse may be used and 1.0mm² tri-rated equipment cable installed between the power distribution unit and the PCaTS 48volt PSU.

Switch Sign Phase and Monitoring

Disable any Lamp Monitoring on the switch sign phase that drives the 48volt Power Supply Unit or the non-dim relay unit. If this is **NOT** disabled it will cause lamp faults to be logged by the controller.

PCaTS Signal Installation

Box Sign Housing

The PCaTS unit is supplied with a modular housing. Specific brackets are supplied with for fitting both the newer modular signal heads (Peek Elite \ Siemens Helios etc...) and the older 300mm style (Mellor \ Plessey etc...)

The PCaTS signal is to be installed alongside the Green Man aspect, preferably to the right (same as a toucan configuration). There should be a short link conduit for the wiring to pass from the Greenman housing to the PCaTS housing.

Once this is in place the installation of the fly lead may commence.

Fly-Lead installation and testing

The PCaTS unit comes with a 2.5m fly-lead with a waterproof multi-pin connector on one end. The lead is a 7-core .

The fly-lead needs to be routed from the PCaTS housing through the Pedestrian signal housings to the flexible conduit and up to the top of the signal pole's termination plate, or if other point of termination.

Typical method of installation would be as follows...

1. Starting with the PCaTS housing run multi-core cable through to the terminal plate.
2. Provide some slack in the cable for future reconnection in the event of a broken core etc and for disconnection/replacement of the PCaTS signal if required.
3. **IMPORTANT.** Before making any connections test the PCaTS lead. As this lead contains both LV and ELV cores it must be fully tested for insulation between each of the cores using 500volt dc test. See IEE reg BS7671.
4. Split the LV and ELV cores sufficiently to reach the point of termination
5. Secure the fly-lead to the termination plate using cable ties
6. Terminate cores (see below) and check.
7. Once PCaTS are energised recheck each signal is receiving 48volts.

The PCaTS signal is connected to the termination point via a lead with a plug and socket connection. The connection for the wiring is as follows...

Function	Wire Colour	Connector Pin
Red Man	Brown	1
Green man	Green	2
Neutral line	Blue	3
48v DC	Red	4
0v DC	Black	5
Monitoring Line +ve	White	6
Monitoring line return	Yellow	7

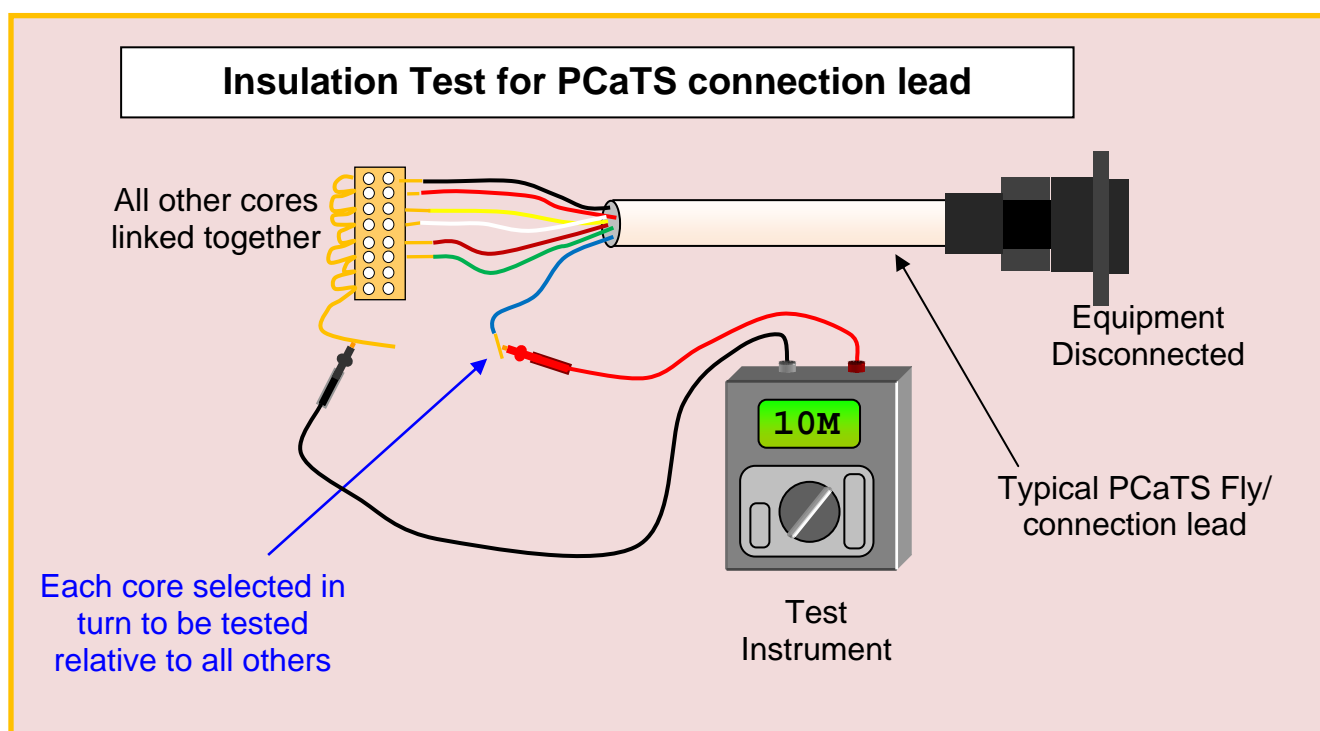
Testing

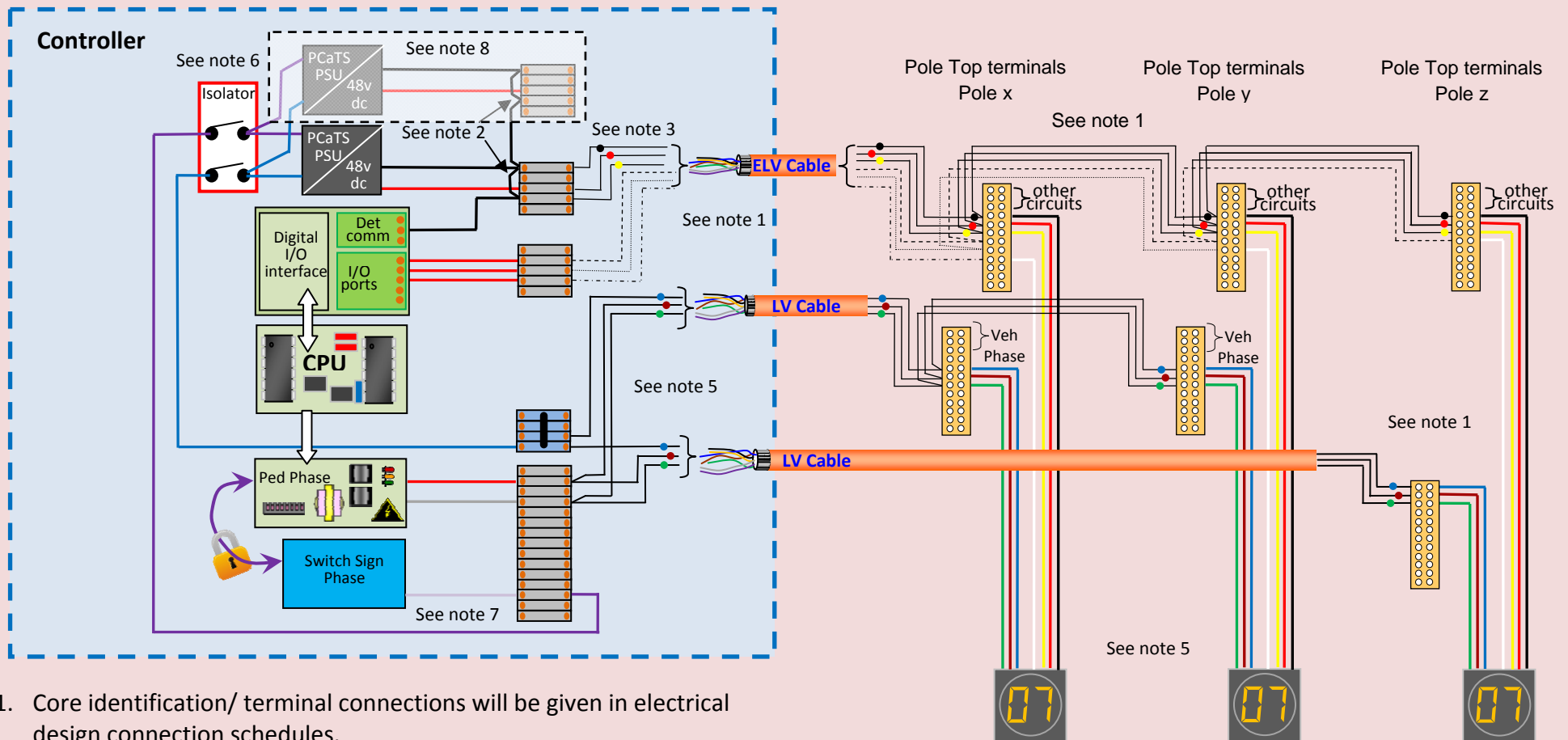
The lead/connection to the PCaTS signal must be tested to ensure the insulation of all the cores is sound. This is particularly important as this product requires both LV and ELV connections to come together in a single connection cable. Therefore the insulation of all cores must meet the criteria of the higher voltage and to do this they must be tested as per IEE regulation, BS7671 at 500v d.c. using an insulation resistance tester.

IMPORTANT

Ensure all voltage sensitive equipment is disconnected from the circuits being tested.

Typical Insulation Test

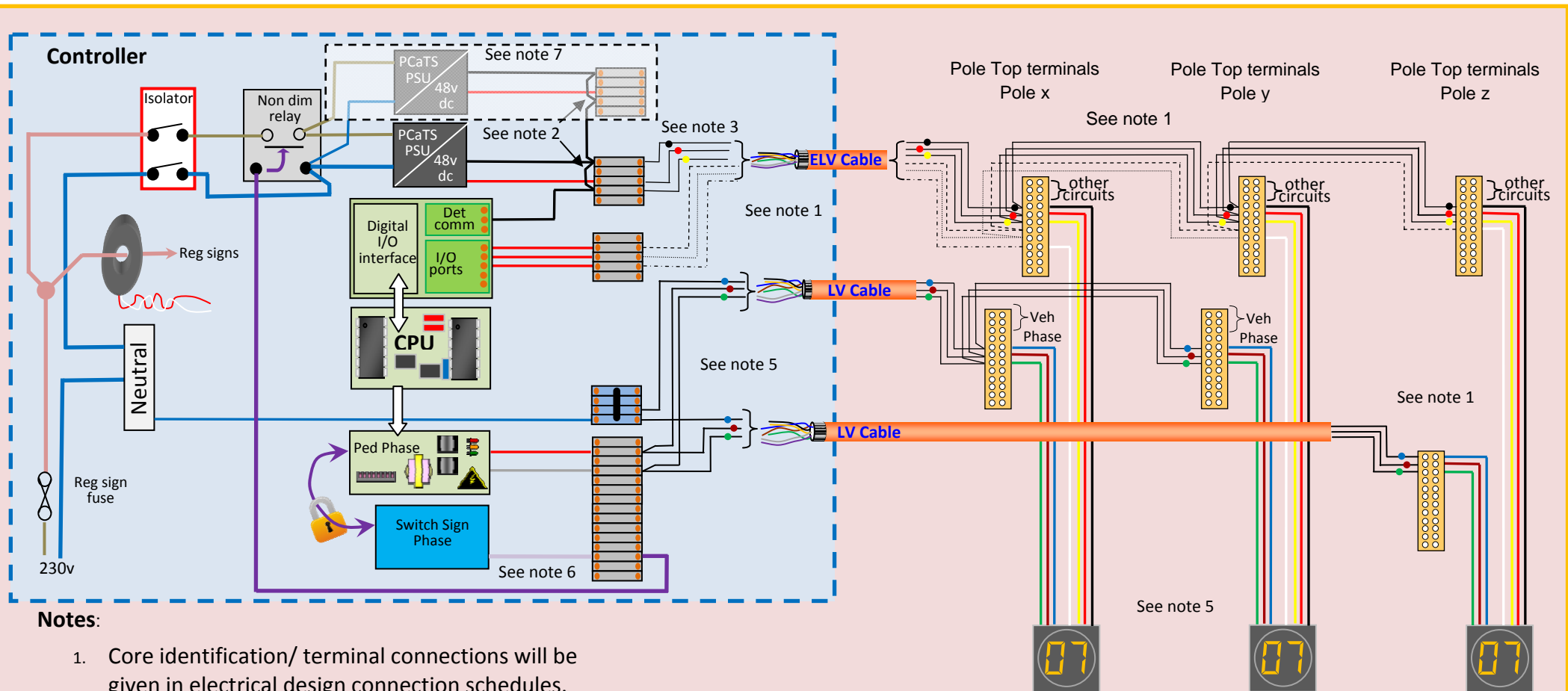




Notes:

1. Core identification/ terminal connections will be given in electrical design connection schedules.
2. PCaTS PSU 0v is connected to Det common
3. Colour spots are shown for ease of reading diagram only
4. Switch sign phase locked in to Ped phase and used to enable PCaTS PSU
5. Colours of cores to PCaTS are as given in the connections table.
6. 48volt PSU to work on 100 - 240v. Example RS 428-411.
7. Monitoring disabled
8. Where a second 48volt PSU is required.

TYPICAL WIRING FOR PCaTS



Notes:

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2. PCaTS PSU 0v is connected to Det common
3. Colour spots are shown for ease of reading diagram only
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TYPICAL WIRING FOR PCaTS
Using Non-dim kit