



NEWEL 3



USER MANUAL

REGULATION OF HEATER CABLES FOR WINDOW DISPLAYS

Digitel reserves the right to modify the technical characteristics described without prior notice.

Non-contractual document

Digitel SA

All rights reserved

4. REGULATION OF HEATER CABLES FOR WINDOW DISPLAYS

4.1. INTRODUCTION

It is assumed that the reader of this document will previously have read the chapter 1 [Introduction to NEWEL3](#). The latter describes all the basic concepts which are essential to an understanding of the present document, and of the concept of the NEWEL3 product range in general.

This manual describes the operation of modules **DC24DT/ETP** which are used for the **regulation of heater cables in window displays**.

4.2. GENERAL DESCRIPTION, BASIC CONNECTIONS

The windows and handrails of refrigeration cabinets are heated in order to prevent the formation of condensation and frost on their surfaces. Constructors will calculate the capacity of heater cables which will be sufficiently high to prevent the formation of condensation under the least favourable conditions (temperature of 25°C and relative humidity of 60%). In European climates, the occurrence of these extreme conditions will be relatively rare, generally restricted to no more than a few days each year. For the remainder of the time, where the temperature and humidity are lower, the heating system installed in the plant will be too powerful, and will consume excessive quantities of energy for no good purpose.

The DC24DTP module reduces the capacity of the heating system to the minimum value required. It measures the ambient temperature and humidity, calculates the dew point temperature and adjusts the capacity of heater cables. The lower the calculated dew point, the greater the reduction in the heating capacity. The exact relationship between the dew point and the requisite heating capacity will depend upon the construction of the cabinet and the temperature of products. This relationship must be determined empirically for each type of cabinet. Parameter [C1] – “Dew point-capacity coefficient (0-9)” will allow the selection of one of ten possible relationships. The following diagram illustrates the movement in heating capacity as a function of the dew point, according to the coefficient selected.

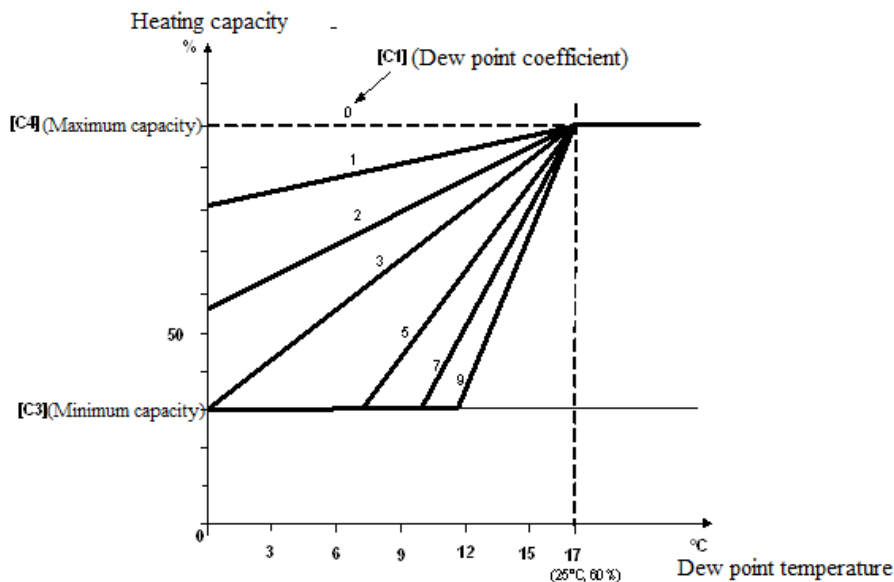


Figure 4.2.1

Parameters [C3] and [C4] define the permissible range of capacity regulation. In case of a fault on one of the probes, the regulator will automatically deploy the maximum authorized capacity.

By programming these two parameters to the same value, the capacity will be fixed, regardless of temperature and humidity measurements. In this case, probes A and D will no longer be mandatory.

The connection circuit layout is shown in **Figure 4.2.2**. Regulation is achieved by the variation of the closing time of the triac thyristor for the control of capacity over a period of 50 seconds (PWM regulation). A single triac thyristor can control a number of heater cables on a number of cabinets. Where the total capacity exceeds the maximum loads of the triac thyristor, a number of triac thyristors (up to a maximum of 10) may be controlled in parallel by the same regulator.

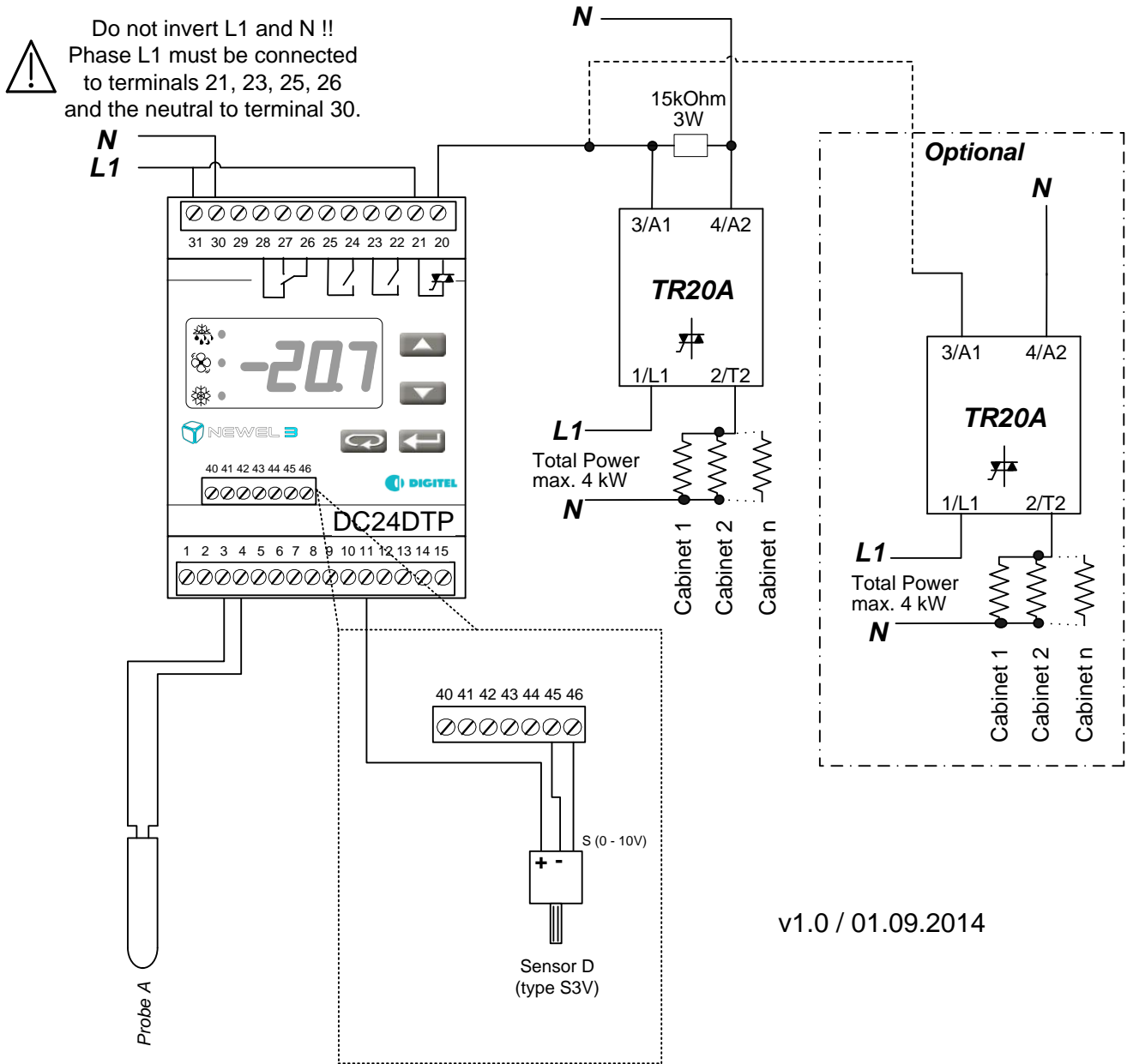


Figure 4.2.2

In larger installations, cabinets may be grouped according to type. In this case, each group will be controlled by a separate regulator with the optimum **[C1]** parameter for the type of cabinets concerned. The humidity probe may be shared between a maximum of 8 regulators, in accordance with the circuit layout shown in Figure 2.

The group number for each regulator will be programmed in parameter **[C2]**. Where regulators are connected to the central remote management unit (DC58), start-up functions for the various groups will be staggered over time, in order to prevent any peaks in consumption.

The following table shows a number of examples for the programming of parameter [C1], according to the category of cabinets concerned.

Freezer cabinets with door closure	1 - 3
Glazed freezer cabinets	2 - 5
Self-service pastry & meat cabinets	4 - 7

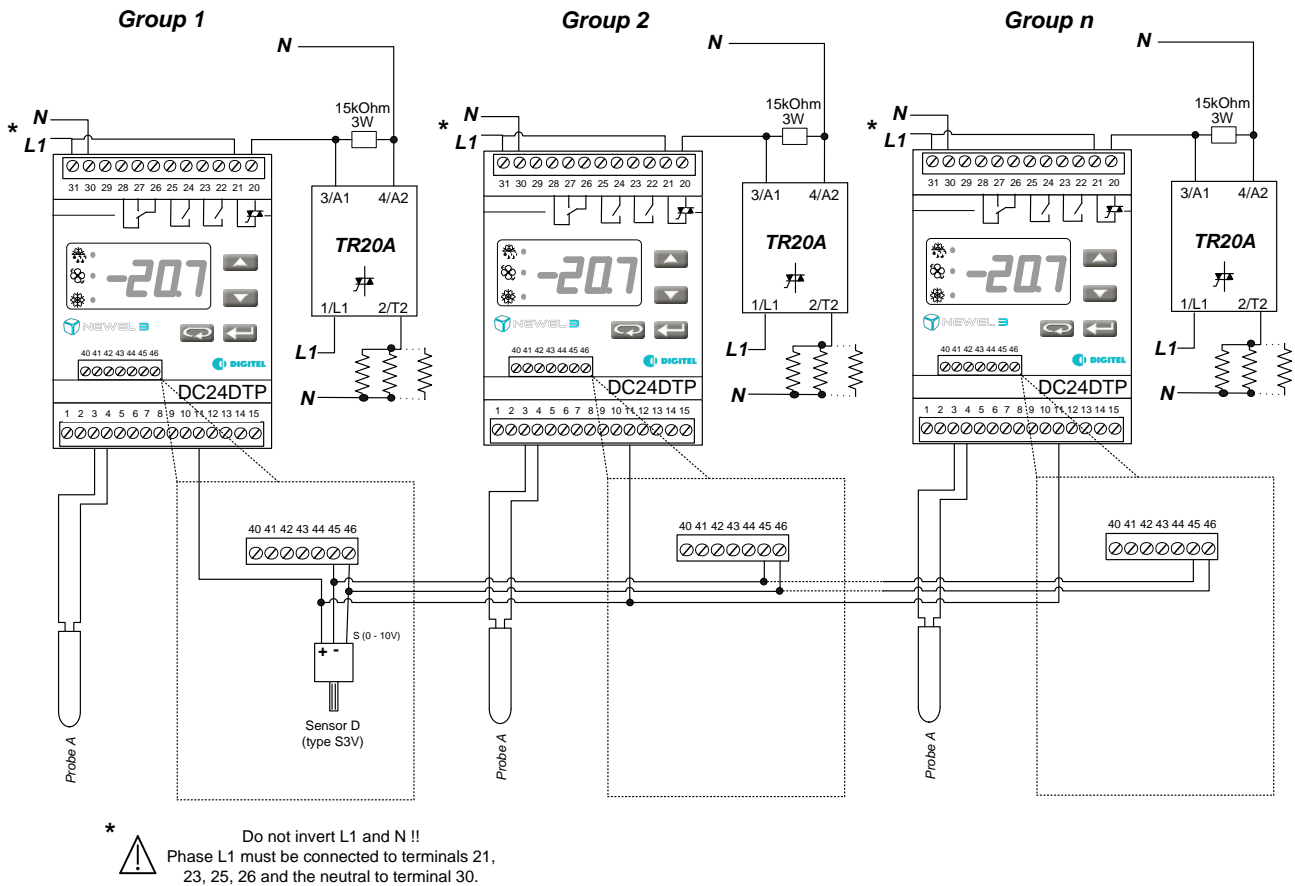


Figure 4.2.3

- [C1] Dew point – capacity coefficient (0-9)
- [C2] Group number
- [C3] Minimum heating capacity
- [C4] Maximum heating capacity