Three-Phase Constant Wattage Heater Control Ratings for the APS–4 Control Panel and SC–40 Satellite Contactor

The APS–4 Control Panel and SC–40 Satellite Contactor are ideal for controlling a wide range of pavement snow melting systems using either self-limiting or constant wattage heaters. This Application Note considers the three-phase power control capability of these products both individually and as system components when controlling constant wattage heaters.

All ETI snow melting controls are Listed to UL Standard 873 for Temperature Indicating and Regulating Equipment. Safety testing is done by either UL or CSA. Thus, the relays and contactors are definite purpose rated for heater control applications. This takes into account the NEC (National Electric Code) 25% de-rating required for snow melting equipment.

The maximum three-phase power ratings for standard supply voltages for the APS–4 Control Panel and SC–40 Satellite Contactor are shown below in the first table. The calculations assume balanced three-phase constant wattage heater loads.

The second table below shows the maximum deiced areas in square feet at power fluxes of 40 and 50 watts per square foot. A constant wattage heater, such as mineral insulated cable, is assumed along with balanced loads.

A minimum system consists of a single APS-4 Control Panel while a maximum system consists of a single APS-4 Control Panel and ten additional SC-40 Satellite Contactors. Table 3 below shows the deiced areas for a maximum system at power fluxes of 40 and 50 watts per square foot.

The capacity information presented herein is theoretical and does not take account of the fact that it may be impossible to symmetrically load each contactor to its maximum rating for a variety of reasons. Thus, an additional SC–40 Satellite Contactor may be required.

MODEL	208 VAC, 3Φ	277 VAC, 3Φ	480 VAC, 3Φ	346 VAC, 3Φ	600VAC 3Φ
APS–4	18.0 KW	41.5 KW	41.5 KW	51.9 KW	51.9 KW
SC–40	18.0 KW	41.5 KW	41.5 KW	51.9 KW	51.9 KW

Table 1. Maximum three-phase power rating, APS–4/SC–40 standard supply voltages.

MODEL	208 VAC, 3Φ	277 VAC, 3Φ	480 VAC, 3Φ	346 VAC, 3Φ	600VAC 3Φ
APS–4	450/360 Ft^2	1,038/830 Ft^2	1,038/830 Ft^2	1,297/1,038 Ft^2	1,297/1,038 Ft^2
SC–40	450/360 Ft^2	1,038/830 Ft^2	1,038/830 Ft^2	1,297/1,038 Ft^2	1,297/1,038 Ft^2

Table 2. Maximum deiced areas in ft^2 at 40 & 50 watts/ft^2.

Power Flux	208 VAC, 3Φ	277 VAC, 3Φ	480 VAC, 3Φ	346 VAC, 3Φ	600VAC 3Φ
40 W/Ft^2	4,950 Ft^2	11,418 Ft^2	11,418 Ft^2	14,267 Ft^2	14,267 Ft^2
50 W/Ft^2	3,960 Ft^2	9,130 Ft^2	9,130 Ft^2	11,418 Ft^2	11,418 Ft^2

Table 3. Deiced areas in ft^2 for a maximum system at 40 & 50 watts/ft^2.

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