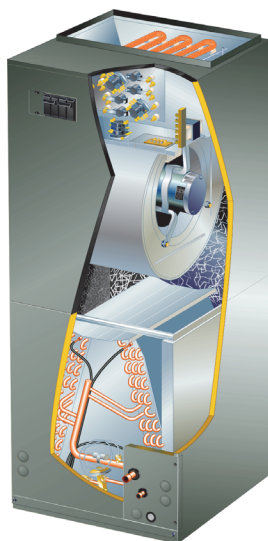


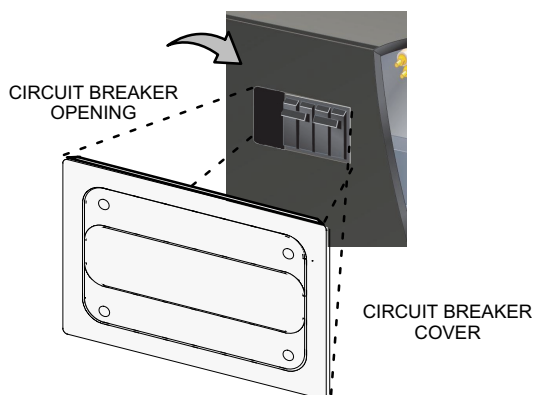
## CB(X)27 Series Units



### Table of Contents

|                                                |         |
|------------------------------------------------|---------|
| Specifications / Electrical Data               | Page 2  |
| Blower Data                                    | Page 4  |
| Parts Arrangement                              | Page 6  |
| I Application                                  | Page 7  |
| II Unit Components                             | Page 7  |
| III Optional Electric Heat                     | Page 9  |
| IV Start Up                                    | Page 27 |
| V Typical Operating Characteristics            | Page 27 |
| VI Maintenance                                 | Page 28 |
| VII Wiring Diagrams and Sequence of Operations | Page 31 |

IT IS HIGHLY RECOMMENDED IF THE AIR HANDLER IS INSTALLED IN A UNCONDITIONED SPACE THAT A CIRCUIT BREAKER COVER (ORDERED SEPARATELY) IS USED. ORDER LENNOX CATALOG # 82W01.



The Elite CB27UH/CBX27UH are high efficiency blower coils. Several models are available in sizes ranging from 1-1/2 through 5 tons (5.3 through 17.6 kW). The CB27UH is an upflow horizontal unit designed for HFC-22 refrigerant and the CBX27UH is an upflow horizontal unit designed for HCFC-410A refrigerant. See unit installation instructions for more detail. A kit is available for downflow applications. CB(X)27 units come with a factory installed check and expansion valve for cooling or heat pump applications.

CB(X)27 series units are designed to be matched with the 14 SEER air conditioner and heat pump lines. While these blower coil units are designed to be primarily matched with these outdoor units, they may be matched with other air conditioners or heat pumps as noted in the rating information.

ECB29 electric heat, in several voltages and kW sizes, can be field installed in the CB(X)27 cabinets.

Information contained in this manual is intended for use by experienced HVAC service technicians only. All specifications are subject to change. Procedures outlined in this manual are presented as a recommendation only and do not supersede or replace local or state codes.

### **⚠ WARNING**

Improper installation, adjustment, alteration, service or maintenance can cause personal injury, loss of life, or damage to property.

Installation and service must be performed by a licensed professional installer (or equivalent) or a service agency.

### **⚠ CAUTION**

Physical contact with metal edges and corners while applying excessive force or rapid motion can result in personal injury. Be aware of, and use caution when working near these areas during installation or while servicing this equipment.

### **⚠ CAUTION**

Physical contact with metal edges and corners while applying excessive force or rapid motion can result in personal injury. Be aware of, and use caution when working near these areas during installation or while servicing this equipment.

## SPECIFICATIONS

| General Data                    | R-22 Model Number                       | CB27UH-018  | CB27UH-024  | CB27UH-030  | CB27UH-036  |
|---------------------------------|-----------------------------------------|-------------|-------------|-------------|-------------|
|                                 | R-410A Model Number                     | CBX27UH-018 | CBX27UH-024 | CBX27UH-030 | CBX27UH-036 |
|                                 | Nominal tonnage                         | 1.5         | 2           | 2.5         | 3           |
| Connections                     | Suction (vapor) line (o.d.) - in. sweat | 3/4         | 3/4         | 3/4         | 3/4         |
|                                 | Liquid line (o.d.) - in. sweat          | 3/8         | 3/8         | 3/8         | 3/8         |
|                                 | Condensate - in. fpt                    | (2) 3/4     | (2) 3/4     | (2) 3/4     | (2) 3/4     |
| Indoor Coil                     | Net face area - ft. <sup>2</sup>        | 4.44        | 4.44        | 5.0         | 5.0         |
|                                 | Tube outside diameter - in.             | 3/8         | 3/8         | 3/8         | 3/8         |
|                                 | Number of rows                          | 3           | 3           | 3           | 3           |
|                                 | Fins per inch                           | 12          | 12          | 12          | 12          |
| Blower                          | Wheel nominal diameter x width - in.    | 10 x 8      | 10 x 8      | 11 x 8      | 11 x 8      |
|                                 | Blower motor output - hp                | 1/2         | 1/2         | 1/2         | 1/2         |
| <sup>1</sup> Filters            | Size of filter - in.                    | 20 x 20 x 1 | 20 x 20 x 1 | 20 x 20 x 1 | 20 x 20 x 1 |
| Shipping Data -1 package - lbs. |                                         | 148         | 148         | 159         | 159         |

## ELECTRICAL DATA

|                                                                        |                          |              |              |              |                       |
|------------------------------------------------------------------------|--------------------------|--------------|--------------|--------------|-----------------------|
|                                                                        | Voltage - 1 phase - 60hz | 208/230V-1ph | 208/230V-1ph | 208/230V-1ph | 208/230V-1ph          |
|                                                                        | Voltage - 3 phase - 60hz | ---          | ---          | ---          | <sup>3</sup> 460V-1ph |
| <sup>2</sup> Maximum Overcurrent Protection (unit only) - All voltages |                          | 15           | 15           | 15           | 15                    |
| Minimum Circuit Ampacity (unit only) - 208/230V                        |                          | 5            | 5            | 5            | 5                     |
| Blower Motor Full Load Amps - 208/230V                                 |                          | 4.1          | 4.1          | 4.1          | 4.1                   |
| Minimum Circuit Ampacity (unit only) - 460V                            |                          | ---          | ---          | ---          | 2.6                   |
| Blower Motor Full Load Amps - 460V                                     |                          | ---          | ---          | ---          | 2.1                   |

## OPTIONAL ACCESSORIES - MUST BE ORDERED EXTRA

|                                                              |                           |       |       |       |
|--------------------------------------------------------------|---------------------------|-------|-------|-------|
| ComfortSense™ 7000 Thermostat                                | Y2081                     | Y2081 | Y2081 | Y2081 |
| Remote Outdoor Temperature Sensor<br>(for ComfortSense 7000) | X2658                     | X2658 | X2658 | X2658 |
| Dehumidification Relay Kit                                   | 26W62                     | 26W62 | 26W62 | 26W62 |
| Down-Flow Additive Floor Base                                | 44K15                     | 44K15 | 44K15 | 44K15 |
| Down-Flow Conversion Kit                                     | 83M57                     | 83M57 | 83M57 | 83M57 |
| Electric Heat - See Electric Heat Data tables                | 2.5 to 20 kW              |       |       |       |
| Healthy Climate<br>Germicidal Light                          | UVC-24V (24V)             | X9423 | X9423 | X9423 |
|                                                              | UVC-41W-S (110/230v-1 ph) | X9424 | X9424 | X9424 |
| Horizontal Support Frame Kit                                 | 56J18                     | 56J18 | 56J18 | 56J18 |
| Side Return Unit Stand (Up-Flow Only)                        | 45K32                     | 45K32 | 45K32 | 45K32 |
| Single Point Power Source Control Box                        | 21H39                     | 21H39 | 21H39 | 21H39 |
| Wall Hanging Bracket Kit (Up-Flow Only)                      | 45K30                     | 45K30 | 45K30 | 45K30 |

<sup>1</sup> Disposable frame type filter.

<sup>2</sup> HACR type circuit breaker or fuse.

<sup>3</sup> Blower motor is 460V - 1 phase. Optional electric heat is 460V - 3 phase.

## SPECIFICATIONS

| General Data                  | R-22 Model Number                       | CB27UH-042  | CB27UH-048  | CB27UH-060  |
|-------------------------------|-----------------------------------------|-------------|-------------|-------------|
|                               | R-410A Model Number                     | CBX27UH-042 | CBX27UH-048 | CBX27UH-060 |
|                               | Nominal tonnage                         | 3.5         | 4           | 5           |
| Connections                   | Suction (vapor) line (o.d.) - in. sweat | 7/8         | 7/8         | 7/8         |
|                               | Liquid line (o.d.) - in. sweat          | 3/8         | 3/8         | 3/8         |
|                               | Condensate - in. fpt                    | (2) 3/4     | (2) 3/4     | (2) 3/4     |
| Indoor Coil                   | Net face area - ft. <sup>2</sup>        | 7.22        | 7.22        | 8.33        |
|                               | Tube outside diameter - in.             | 3/8         | 3/8         | 3/8         |
|                               | Number of rows                          | 3           | 3           | 3           |
|                               | Fins per inch                           | 12          | 12          | 12          |
| Blower                        | Wheel nominal diameter x width - in.    | 12 x 9      | 12 x 9      | 12 x 9      |
|                               | Blower motor output - hp                | 1           | 1           | 1           |
| <sup>1</sup> Filters          | Size of filter - in.                    | 20 x 24 x 1 | 20 x 24 x 1 | 20 x 24 x 1 |
| Shipping Data -1 package lbs. |                                         | 194         | 194         | 216         |

## ELECTRICAL DATA

|                                                                        |                          |              |                       |                       |
|------------------------------------------------------------------------|--------------------------|--------------|-----------------------|-----------------------|
|                                                                        | Voltage - 1 phase - 60hz | 208/230V-1ph | 208/230V- 1ph         | 208/230V- 1ph         |
|                                                                        | Voltage - 3 phase - 60hz | ---          | <sup>3</sup> 460V-1ph | <sup>3</sup> 460V-1ph |
| <sup>2</sup> Maximum Overcurrent Protection (unit only) - All voltages |                          | 15           | 15                    | 15                    |
| Minimum Circuit Ampacity (unit only) - 208/230V                        |                          | 10           | 10                    | 10                    |
| Blower Motor Full Load Amps - 208/230V                                 |                          | 7.6          | 7.6                   | 7.6                   |
| Minimum Circuit Ampacity (unit only)V - 460V                           |                          | ---          | 5                     | 5                     |
| Blower Motor Full Load Amps - 460V                                     |                          | ---          | 4                     | 4                     |

<sup>1</sup> Disposable frame type filter.

<sup>2</sup> HACR type circuit breaker or fuse.

<sup>3</sup> Blower motor is 460V - 1 phase. Optional electric heat is 460V - 3 phase.

## REPLACEMENT CIRCUIT BREAKERS

| Voltage            | Description    | Catalog No.  |
|--------------------|----------------|--------------|
| 208/240V - 1 Phase | 25 amp, 2 pole | <b>41K13</b> |
|                    | 30 amp, 2 pole | <b>17K70</b> |
|                    | 35 amp, 2 pole | <b>72K07</b> |
|                    | 40 amp, 2 pole | <b>49K14</b> |
|                    | 45 amp, 2 pole | <b>17K71</b> |
|                    | 50 amp, 2 pole | <b>41K12</b> |
|                    | 60 amp, 2 pole | <b>17K72</b> |
| 208/240V - 3 Phase | 30 amp, 3 pole | <b>18M85</b> |
|                    | 40 amp, 3 pole | <b>41K16</b> |
|                    | 45 amp, 3 pole | <b>18M86</b> |
|                    | 50 amp, 3 pole | <b>41K15</b> |
|                    | 60 amp, 3 pole | <b>41K17</b> |

**BLOWER DATA****CB(X)27UH-018 BLOWER PERFORMANCE**

| External Static Pressure<br>in. w.g. | Air Volume and Motor Watts at 208V |       |       |       |       |       |       |       |       |       | Air Volume and Motor Watts at 230V |       |       |       |       |       |       |       |       |       |
|--------------------------------------|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                                      | Tap 1                              |       | Tap 2 |       | Tap 3 |       | Tap 4 |       | Tap 5 |       | Tap 1                              |       | Tap 2 |       | Tap 3 |       | Tap 4 |       | Tap 5 |       |
|                                      | cfm                                | Watts | cfm   | Watts | cfm   | Watts | cfm   | Watts | cfm   | Watts | cfm                                | Watts | cfm   | Watts | cfm   | Watts | cfm   | Watts | cfm   | Watts |
| .00                                  | 815                                | 80    | 810   | 77    | 835   | 86    | 855   | 89    | 1010  | 137   | 820                                | 82    | 815   | 77    | 835   | 84    | 850   | 91    | 1010  | 140   |
| .10                                  | 720                                | 71    | 700   | 68    | 735   | 76    | 790   | 89    | 980   | 142   | 710                                | 71    | 715   | 71    | 735   | 77    | 795   | 89    | 975   | 144   |
| .20                                  | 580                                | 59    | 560   | 58    | 665   | 76    | 755   | 99    | 950   | 153   | 570                                | 59    | 580   | 60    | 660   | 77    | 755   | 99    | 950   | 154   |
| .30                                  | 500                                | 63    | 450   | 55    | 610   | 78    | 710   | 101   | 905   | 157   | 505                                | 64    | 440   | 58    | 615   | 80    | 715   | 102   | 910   | 160   |
| .40                                  | 400                                | 65    | 350   | 59    | 580   | 87    | 685   | 111   | 870   | 166   | 415                                | 67    | 355   | 60    |       | 89    | 680   | 112   | 875   | 170   |
| .50                                  | 365                                | 74    | 290   | 60    | 505   | 96    | 640   | 114   | 835   | 176   | 355                                | 77    | 300   | 64    | 510   | 99    | 630   | 118   | 850   | 179   |
| .60                                  | 315                                | 75    | 280   | 68    | 445   | 100   | 580   | 124   | 800   | 179   | 320                                | 77    | 270   | 71    | 450   | 102   | 575   | 129   | 805   | 183   |
| .70                                  | N/A                                | N/A   | 210   | 71    | 390   | 102   | 515   | 128   | 755   | 187   | N/A                                | N/A   | 220   | 72    | 395   | 106   | 525   | 137   | 780   | 192   |
| .80                                  | N/A                                | N/A   | 170   | 71    | 355   | 109   | 470   | 136   | 710   | 194   | N/A                                | N/A   | 175   | 76    | 365   | 112   | 485   | 144   | 725   | 200   |

**CB(X)27UH-024 BLOWER PERFORMANCE**

| External Static Pressure<br>in. w.g. | Air Volume and Motor Watts at 208V |       |       |       |       |       |       |       |       |       | Air Volume and Motor Watts at 230V |       |       |       |       |       |       |       |       |       |
|--------------------------------------|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                                      | Tap 1                              |       | Tap 2 |       | Tap 3 |       | Tap 4 |       | Tap 5 |       | Tap 1                              |       | Tap 2 |       | Tap 3 |       | Tap 4 |       | Tap 5 |       |
|                                      | cfm                                | Watts | cfm   | Watts | cfm   | Watts | cfm   | Watts | cfm   | Watts | cfm                                | Watts | cfm   | Watts | cfm   | Watts | cfm   | Watts | cfm   | Watts |
| .00                                  | 885                                | 89    | 885   | 89    | 930   | 97    | 1035  | 130   | 1185  | 184   | 890                                | 91    | 895   | 90    | 920   | 99    | 1040  | 130   | 1190  | 189   |
| .10                                  | 755                                | 77    | 760   | 77    | 850   | 98    | 995   | 139   | 1140  | 193   | 785                                | 82    | 770   | 78    | 855   | 100   | 1000  | 142   | 1145  | 200   |
| .20                                  | 665                                | 73    | 670   | 72    | 820   | 106   | 970   | 148   | 1100  | 203   | 675                                | 76    | 670   | 76    | 820   | 111   | 960   | 152   | 1110  | 207   |
| .30                                  | 605                                | 77    | 600   | 77    | 775   | 112   | 920   | 154   | 1070  | 213   | 605                                | 80    | 605   | 80    | 780   | 114   | 930   | 156   | 1085  | 219   |
| .40                                  | 560                                | 84    | 515   | 88    | 725   | 121   | 885   | 165   | 1025  | 219   | 570                                | 88    | 555   | 88    | 745   | 123   | 890   | 166   | 1035  | 225   |
| .50                                  | 445                                | 95    | 445   | 95    | 675   | 124   | 835   | 171   | 1000  | 228   | 465                                | 99    | 465   | 99    | 670   | 131   | 850   | 172   | 1010  | 235   |
| .60                                  | 400                                | 98    | 395   | 96    | 570   | 137   | 810   | 179   | 960   | 232   | 405                                | 101   | 405   | 101   | 595   | 142   | 815   | 183   | 975   | 246   |
| .70                                  | N/A                                | N/A   | 345   | 101   | 520   | 143   | 705   | 193   | 920   | 242   | N/A                                | N/A   | 350   | 106   | 530   | 151   | 710   | 197   | 935   | 248   |
| .80                                  | N/A                                | N/A   | 320   | 106   | 460   | 148   | 625   | 201   | 835   | 254   | N/A                                | N/A   | 330   | 112   | 485   | 155   | 660   | 207   | 895   | 260   |

**CB(X)27UH-030 BLOWER PERFORMANCE**

| External Static Pressure<br>in. w.g. | Air Volume and Motor Watts at 208V |       |       |       |       |       |       |       |       |       | Air Volume and Motor Watts at 230V |       |       |       |       |       |       |       |       |       |
|--------------------------------------|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                                      | Tap 1                              |       | Tap 2 |       | Tap 3 |       | Tap 4 |       | Tap 5 |       | Tap 1                              |       | Tap 2 |       | Tap 3 |       | Tap 4 |       | Tap 5 |       |
|                                      | cfm                                | Watts | cfm   | Watts | cfm   | Watts | cfm   | Watts | cfm   | Watts | cfm                                | Watts | cfm   | Watts | cfm   | Watts | cfm   | Watts | cfm   | Watts |
| .00                                  | 1130                               | 128   | 1175  | 142   | 1230  | 158   | 1270  | 177   | 1345  | 208   | 1145                               | 130   | 1180  | 142   | 1235  | 161   | 1280  | 179   | 1365  | 212   |
| .10                                  | 1045                               | 118   | 1065  | 126   | 1140  | 151   | 1240  | 183   | 1345  | 219   | 1030                               | 118   | 1085  | 130   | 1155  | 154   | 1245  | 183   | 1345  | 223   |
| .20                                  | 910                                | 103   | 950   | 113   | 1105  | 160   | 1205  | 193   | 1305  | 231   | 915                                | 105   | 955   | 116   | 1120  | 164   | 1205  | 195   | 1310  | 237   |
| .30                                  | 730                                | 89    | 870   | 117   | 1050  | 169   | 1165  | 202   | 1250  | 238   | 755                                | 91    | 885   | 118   | 1060  | 171   | 1170  | 207   | 1265  | 242   |
| .40                                  | 605                                | 93    | 825   | 120   | 1020  | 176   | 1115  | 209   | 1205  | 248   | 655                                | 92    | 830   | 124   | 1030  | 180   | 1125  | 213   | 1230  | 254   |
| .50                                  | 540                                | 101   | 725   | 136   | 980   | 181   | 1085  | 218   | 1180  | 257   | 550                                | 102   | 745   | 136   | 985   | 184   | 1090  | 223   | 1195  | 265   |
| .60                                  | 470                                | 106   | 670   | 145   | 930   | 191   | 1035  | 224   | 1140  | 262   | 475                                | 107   | 670   | 149   | 945   | 195   | 1050  | 230   | 1145  | 270   |
| .70                                  | N/A                                | N/A   | 605   | 154   | 835   | 207   | 995   | 235   | 1105  | 273   | N/A                                | N/A   | 620   | 159   | 860   | 213   | 1005  | 242   | 1110  | 280   |
| .80                                  | N/A                                | N/A   | 545   | 159   | 785   | 217   | 950   | 245   | 1055  | 284   | N/A                                | N/A   | 560   | 163   | 805   | 223   | 915   | 258   | 1050  | 295   |

**CB(X)27UH-036 BLOWER PERFORMANCE**

| External Static Pressure<br>in. w.g. | Air Volume and Motor Watts at 208V |           |           |           |           | Air Volume and Motor Watts at 230V / 460V |           |           |           |           |
|--------------------------------------|------------------------------------|-----------|-----------|-----------|-----------|-------------------------------------------|-----------|-----------|-----------|-----------|
|                                      | Tap 1                              | Tap 2     | Tap 3     | Tap 4     | Tap 5     | Tap 1                                     | Tap 2     | Tap 3     | Tap 4     | Tap 5     |
|                                      | cfm Watts                          | cfm Watts | cfm Watts | cfm Watts | cfm Watts | cfm Watts                                 | cfm Watts | cfm Watts | cfm Watts | cfm Watts |
| .00                                  | 1185 136                           | 1225 149  | 1320 184  | 1430 234  | 1545 293  | 1180 139                                  | 1230 152  | 1330 191  | 1440 238  | 1555 299  |
| .10                                  | 1070 125                           | 1125 137  | 1280 196  | 1395 244  | 1515 303  | 1085 129                                  | 1125 141  | 1195 201  | 1405 251  | 1520 313  |
| .20                                  | 960 113                            | 1010 130  | 1240 201  | 1360 255  | 1475 314  | 955 114                                   | 1025 132  | 1260 213  | 1365 264  | 1485 325  |
| .30                                  | 815 101                            | 970 136   | 1195 214  | 1310 265  | 1430 322  | 805 105                                   | 975 142   | 1210 219  | 1330 275  | 1445 337  |
| .40                                  | 750 106                            | 915 148   | 1155 225  | 1275 273  | 1385 334  | 770 114                                   | 930 153   | 1170 231  | 1285 283  | 1405 345  |
| .50                                  | 670 119                            | 870 153   | 1110 231  | 1240 284  | 1345 345  | 670 128                                   | 870 159   | 1120 243  | 1250 295  | 1365 357  |
| .60                                  | 605 130                            | 825 163   | 1160 242  | 1190 290  | 1315 355  | 605 134                                   | 810 173   | 1080 249  | 1210 307  | 1330 367  |
| .70                                  | 555 137                            | 725 177   | 1125 251  | 1145 301  | 1270 359  | 565 142                                   | 725 185   | 1040 260  | 1160 313  | 1285 378  |
| .80                                  | 515 142                            | 670 282   | 970 262   | 1100 312  | 1225 369  | 525 146                                   | 675 195   | 980 276   | 1120 324  | 1245 391  |

**CB(X)27UH-042 BLOWER PERFORMANCE**

| External Static Pressure<br>in. w.g. | Air Volume and Motor Watts at 208V |           |           |           |           | Air Volume and Motor Watts at 230V |           |           |           |           |
|--------------------------------------|------------------------------------|-----------|-----------|-----------|-----------|------------------------------------|-----------|-----------|-----------|-----------|
|                                      | Tap 1                              | Tap 2     | Tap 3     | Tap 4     | Tap 5     | Tap 1                              | Tap 2     | Tap 3     | Tap 4     | Tap 5     |
|                                      | cfm Watts                          | cfm Watts | cfm Watts | cfm Watts | cfm Watts | cfm Watts                          | cfm Watts | cfm Watts | cfm Watts | cfm Watts |
| .00                                  | 1475 198                           | 1530 218  | 1610 251  | 1705 295  | 1805 349  | 1475 200                           | 1530 222  | 1615 254  | 1705 300  | 1815 350  |
| .10                                  | 1370 183                           | 1420 207  | 1545 251  | 1660 307  | 1780 364  | 1360 184                           | 1435 207  | 1545 255  | 1665 310  | 1775 368  |
| .20                                  | 1255 172                           | 1305 189  | 1515 266  | 1635 322  | 1750 378  | 1245 172                           | 1305 190  | 1515 269  | 1630 326  | 1750 384  |
| .30                                  | 1090 153                           | 1250 200  | 1470 278  | 1600 336  | 1705 390  | 1090 155                           | 1255 203  | 1470 278  | 1605 343  | 1715 395  |
| .40                                  | 1010 164                           | 1190 210  | 1430 295  | 1560 346  | 1685 407  | 1020 165                           | 1200 213  | 1420 300  | 1565 351  | 1680 408  |
| .50                                  | 955 177                            | 1145 225  | 1385 310  | 1510 373  | 1640 428  | 955 178                            | 1150 229  | 1385 314  | 1520 373  | 1650 430  |
| .60                                  | 885 183                            | 1090 242  | 1330 319  | 1475 384  | 1590 443  | 915 183                            | 1095 243  | 1330 324  | 1480 390  | 1595 453  |
| .70                                  | N/A N/A                            | 1005 248  | 1255 341  | 1430 401  | 1565 457  | N/A N/A                            | 1000 254  | 1265 344  | 1440 408  | 1565 468  |
| .80                                  | N/A N/A                            | 990 260   | 1200 355  | 1365 419  | 1510 473  | N/A N/A                            | 1000 255  | 1200 362  | 1375 429  | 1515 481  |

**CB(X)27UH-048 BLOWER PERFORMANCE**

| External Static Pressure<br>in. w.g. | Air Volume and Motor Watts at 208V |           |           |           |           | Air Volume and Motor Watts at 230V / 460V |           |           |           |           |
|--------------------------------------|------------------------------------|-----------|-----------|-----------|-----------|-------------------------------------------|-----------|-----------|-----------|-----------|
|                                      | Tap 1                              | Tap 2     | Tap 3     | Tap 4     | Tap 5     | Tap 1                                     | Tap 2     | Tap 3     | Tap 4     | Tap 5     |
|                                      | cfm Watts                          | cfm Watts | cfm Watts | cfm Watts | cfm Watts | cfm Watts                                 | cfm Watts | cfm Watts | cfm Watts | cfm Watts |
| .00                                  | 1440 200                           | 1515 233  | 1670 304  | 1690 313  | 1850 413  | 1440 202                                  | 1525 237  | 1680 309  | 1700 319  | 1860 422  |
| .10                                  | 1370 188                           | 1455 224  | 1650 318  | 1670 329  | 1825 421  | 1370 189                                  | 1465 224  | 1665 324  | 1685 331  | 1840 431  |
| .20                                  | 1260 173                           | 1425 231  | 1635 327  | 1660 337  | 1825 436  | 1255 177                                  | 1425 235  | 1650 331  | 1675 342  | 1840 443  |
| .30                                  | 1120 166                           | 1380 242  | 1605 343  | 1630 351  | 1800 447  | 1125 167                                  | 1380 243  | 1625 349  | 1645 358  | 1815 461  |
| .40                                  | 1055 172                           | 1335 260  | 1565 352  | 1595 367  | 1770 462  | 1055 177                                  | 1335 262  | 1585 358  | 1605 373  | 1780 471  |
| .50                                  | 960 190                            | 1295 273  | 1530 372  | 1555 377  | 1735 479  | 970 194                                   | 1290 278  | 1535 378  | 1570 385  | 1745 490  |
| .60                                  | 895 195                            | 1230 285  | 1490 389  | 1510 401  | 1695 489  | 890 201                                   | 1230 296  | 1500 396  | 1525 408  | 1720 506  |
| .70                                  | N/A N/A                            | 1145 304  | 1445 407  | 1470 418  | 1650 513  | N/A N/A                                   | 1140 308  | 1455 415  | 1490 425  | 1665 533  |
| .80                                  | N/A N/A                            | 1095 317  | 1385 416  | 1430 432  | 1605 530  | N/A N/A                                   | 1075 325  | 1405 435  | 1430 445  | 1630 551  |

## CB(X)27UH-060 BLOWER PERFORMANCE

| External Static Pressure<br>in. w.g. | Air Volume and Motor Watts at 208V |       |       |       |       |       |       |       |       |       | Air Volume and Motor Watts at 230V / 460V |       |       |       |       |       |       |       |       |       |
|--------------------------------------|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                                      | Tap 1                              |       | Tap 2 |       | Tap 3 |       | Tap 4 |       | Tap 5 |       | Tap 1                                     |       | Tap 2 |       | Tap 3 |       | Tap 4 |       | Tap 5 |       |
|                                      | cfm                                | Watts | cfm   | Watts | cfm   | Watts | cfm   | Watts | cfm   | Watts | cfm                                       | Watts | cfm   | Watts | cfm   | Watts | cfm   | Watts | cfm   | Watts |
| .00                                  | 1490                               | 207   | 1765  | 331   | 1970  | 455   | 2010  | 494   | 2365  | 799   | 1505                                      | 212   | 1775  | 337   | 1980  | 461   | 2025  | 497   | 2365  | 822   |
| .10                                  | 1395                               | 194   | 1740  | 344   | 1930  | 466   | 1985  | 507   | 2328  | 810   | 1400                                      | 198   | 1745  | 352   | 1950  | 475   | 1990  | 514   | 2345  | 839   |
| .20                                  | 1320                               | 192   | 1700  | 354   | 1900  | 480   | 1955  | 522   | 2300  | 827   | 1325                                      | 196   | 1705  | 361   | 1910  | 490   | 1965  | 532   | 2310  | 850   |
| .30                                  | 1275                               | 206   | 1670  | 367   | 1875  | 487   | 1915  | 531   | 2265  | 842   | 1270                                      | 211   | 1675  | 374   | 1890  | 507   | 1930  | 540   | 2285  | 863   |
| .40                                  | 1220                               | 214   | 1620  | 378   | 1825  | 504   | 1890  | 544   | 2235  | 850   | 1230                                      | 224   | 1635  | 390   | 1840  | 516   | 1905  | 556   | 2255  | 882   |
| .50                                  | 1170                               | 226   | 1575  | 395   | 1795  | 519   | 1850  | 555   | 2205  | 861   | 1185                                      | 231   | 1590  | 402   | 1815  | 532   | 1875  | 573   | 2225  | 891   |
| .60                                  | 1135                               | 241   | 1535  | 409   | 1750  | 529   | 1810  | 569   | 2175  | 872   | 1140                                      | 239   | 1545  | 419   | 1785  | 550   | 1825  | 585   | 2190  | 908   |
| .70                                  | N/A                                | N/A   | 1490  | 417   | 1720  | 543   | 1775  | 585   | 2135  | 885   | N/A                                       | N/A   | 1510  | 426   | 1735  | 562   | 1795  | 602   | 2155  | 922   |
| .80                                  | N/A                                | N/A   | 1470  | 429   | 1685  | 557   | 1730  | 592   | 2085  | 893   | N/A                                       | N/A   | 1480  | 442   | 1700  | 574   | 1760  | 619   | 2120  | 940   |

## CB27UH & CBX27UH PARTS ARRANGEMENT

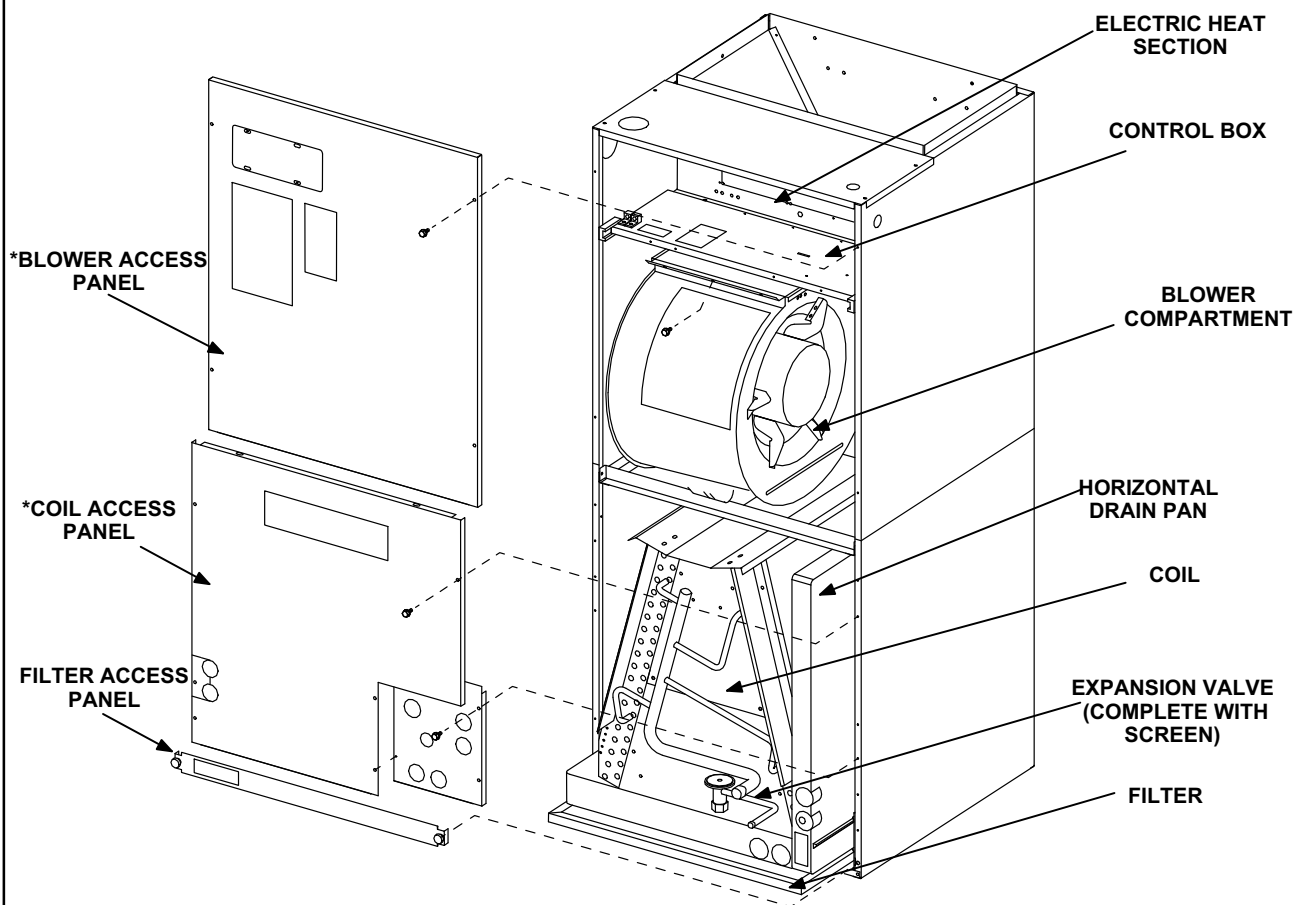


FIGURE 1

## CB27UH & CBX27UH CONTROL BOX

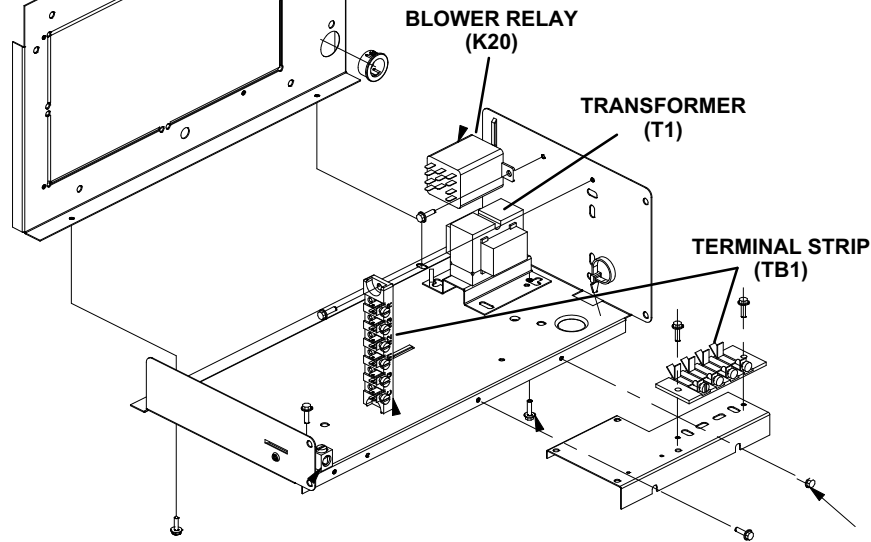


FIGURE 2

### I-APPLICATION

All major blower coil components must be matched according to Lennox recommendations for the unit to be covered under warranty. Refer to the Engineering Handbook for approved system matchups. A misapplied system will cause erratic operation and can result in early unit failure. The units come with factory installed check and expansion valve for all applications. The TXV valve has been installed internally for a cleaner installation and is accessible if required.

#### ELECTROSTATIC DISCHARGE (ESD)

##### Precautions and Procedures

### ⚠ CAUTION

Electrostatic discharge can affect electronic components. Take precautions during unit installation and service to protect the unit's electronic controls. Precautions will help to avoid control exposure to electrostatic discharge by putting the unit, the control and the technician at the same electrostatic potential. Neutralize electrostatic charge by touching hand and all tools on an unpainted unit surface before performing any service procedure.

### II-UNIT COMPONENTS

#### A-Control Box

See figure 2 for CB(X)27UH control box. Line voltage and electric heat connections are made in the control box. Optional electric heat fits through an opening located in the center of the control box. When electric heat is not used, knock out plates cover the opening. The electric heat control arrangement is detailed in the electric heat section of this manual.

#### B-Terminal Strip (TB1)

CB(X)27UH units are equipped with a low voltage terminal strip (TB1) located in the control box. See figure 2. The strip is used for making up all indoor thermostat wires. The outdoor unit low voltage wiring connections to TB1 may be spliced with wire nuts inside the CB units.

##### *Y1 to Y2 Jumper*

A factory installed jumper will be installed between "Y1 and "Y2" for single-stage stage cooling. Remove the jumper for two-stage cooling.

##### *R to W2 Jumper*

A factory installed jumper will be installed between "R" and "W2" for single-stage heat pump applications. Remove the jumper for two-stage non heat pump application.

### C-Transformer (T1)

CB(X)27UH series units use a single line voltage to 24VAC transformer mounted in the control box. The transformer supplies power to the control circuits in the indoor and outdoor unit. Transformers are rated at 70VA. 208/240VAC single phase transformers use two primary voltage taps as shown in figure 3.

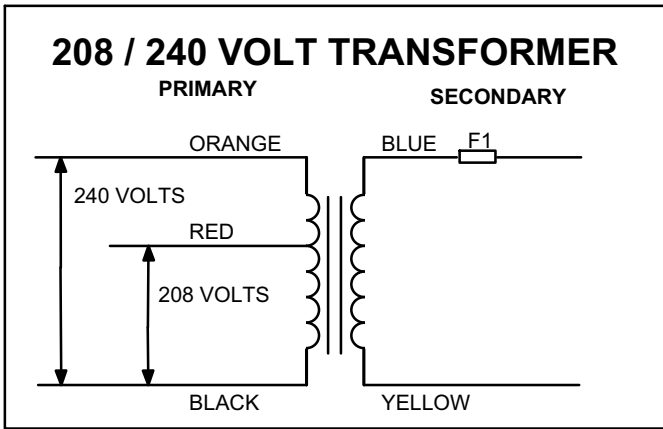


FIGURE 3

### D- Fuse (F1)

All transformers used in the CB(X)27UH series units have a fuse (F1) wired in series on the low secondary side. See figure 3. F1 provides secondary voltage overcurrent protection and is rated at 3 amps.

### E-Blower Relay (K20)

CB(X)27UH units use a DPDT relay to energize the blower motor during a call for *electric heat only*. When the relay coil is energized on an electric heat call, a set of N.O. contacts closes to energize the blower motor on heating speed.

### F-Dehumidification Relay (K183)

Relay K183 is used for dehumidification during cooling demand. K183 decreases blower speed resulting in an increase in the amount of moisture taken from the air. See wiring diagram on page Page 43 and operation sequence on Page 43 for more detail.

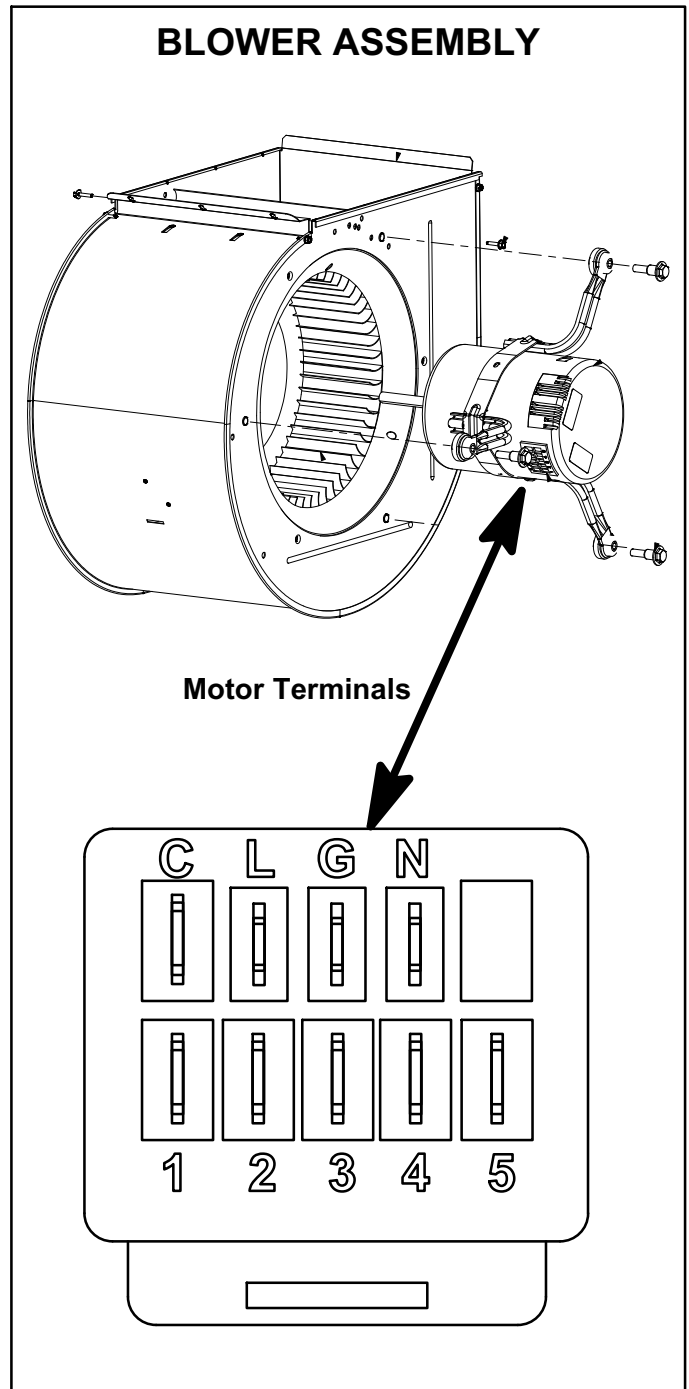


FIGURE 4

### G-Blower Motor (B3)

#### ⚠ IMPORTANT

Blower motor features programmed electronic braking. The integral control brakes the motor near the end of the supply air blower operation, allowing the motor to maintain a more controlled ramping shut-down. Each blower is statically and dynamically balanced as an assembly before installation in the unit.



CB(X)27UH units are equipped with an indoor blower motor that is permanent magnetic with constant torque. The motor has 5 signal level speed taps all referenced to the same signal common. Each tap requires 24 volts to energize.

### Multiple Taps Energized

It is acceptable to have more than one tap energized at once but the micro-controller (integrated in the motor) will default to the highest tap. For example tap five will have precedence over tap four.

### Input Voltage Requirements

The circuit is designed to be operated with AC voltage. To enable a tap requires 12 to 33VAC. Expected current draw will be less than 20mA.

### Troubleshooting

Troubleshooting the motor is an easy process. Follow steps below.

- 1- Shut off power to unit.
- 2- Remove input plug from motor. Turn power back on to unit.
- 3- Check for 230 volts across terminals "L" and "N" on the input plug. See figure 4. If voltage is present continue. If voltage is not present problem may be up stream of the motor input plug.
- 4- Check for 24 volts across terminals "C" and speed tap used (1, 2, 3, 4 or 5) on the input plug. See figure 4. If 24 volts is not present problem may be up stream of the motor input plug.

If correct voltage is present in steps 3 and 4 and motor is not operating properly, replace motor. The motor is not field repairable.

### H-Coil

CB(X)27UH units have dual slab coils arranged in an "A" configuration. Each coil has two or three rows of copper tubes fitted with ripple-edged aluminum fins. An expansion valve complete with screen, feeds multiple parallel circuits through the coils. The coil is designed to easily slide out of the unit cabinet.

### I-Plastic Drain Pans

Both upflow/downflow and horizontal drain pans are provided and installed on the CB(X)27UH units. The drain pans are made from fiberglass filled plastic. The drain hole on horizontal pans are used for right-hand discharge only, and must be plugged when the unit is configured for left-hand discharge.

## III-OPTIONAL ECB29 ELECTRIC HEAT

### A-Matchups and Ratings

See Tables 1 through 4 show all approved , and

CB(X)27UH to ECB29 matchups and electrical ratings.

## B-Electric Heat Components

ECB29 parts arrangement is shown in figures 5 through 9. All electric heat sections consist of components mounted to the electric heat vestibule panel and electric heating elements exposed directly to the air stream. 208/230V electric heat sections may be equipped with circuit breakers. The circuit breakers are designated by CB in the model number. The electric heat section is connected to the unit via jack J2, which plugs into plug P2 of the unit.

### Electric Heat Sequencer Relays

(K32, K33, K34, K35, K116, K117) (208/230 volt only)

Relays K32, K33, K34, K35, K116 and K117 are N.O. sequencer relays with a resistive element for a coil and a bi-metal disk which actuates the contacts. The relays are located on the electric heat vestibule panel and are energized by a 24V heating demand (W1, W2, and W3) via jack/plug 2. When energized, the internal resistance heats the bi-metal disk causing the contacts to close. When the relay is de-energized, the disk cools and the contacts open. The relays energize different stages of heat, as well as the blower. The blower is always first on and last off.

### Primary(S15) & Secondary(S20) Temperature Limits

Both the primary (S15) and secondary (S20) limits are located on the electric heat vestibule panel and are exposed directly to the air stream through an opening in the panel. The high temperature limits are SPST N.C. limits with the primary limit being an auto-reset limit and the secondary limit being a "one-time" limit. One-time limits need to be replaced when opened. The limits are factory set and are not adjustable.

### 208/230 Volt Electric Heat Sections

Each stage of the 208/230 electric heat is protected by a primary (S15) and secondary (S20) high temperature limit. Both S15 and S20 are located in the same housing. Each stage use the same style of limits. Both the primary and secondary limits are wired in series with a heat element. When either S15 or S20 opens, the corresponding heat element is de-energized. All other heating elements remain energized. The primary high temperature limit opens at  $150^{\circ}\text{F} \pm 5^{\circ}\text{F}$  ( $65.5^{\circ}\text{C} \pm 2.8^{\circ}\text{C}$ ) on a temperature rise and automatically resets at  $110^{\circ}\text{F} \pm 9^{\circ}\text{F}$  ( $43.3^{\circ}\text{C} \pm 5.0^{\circ}\text{C}$ ) on a temperature fall. The secondary high temperature limit opens at  $333^{\circ}\text{F} \pm 10^{\circ}\text{F}$  ( $167.2^{\circ}\text{C} \pm 5.6^{\circ}\text{C}$ ) on a temperature rise. If the secondary limit opens it will need to be replaced.

**Circuit Breaker (CB1, CB2, and CB3)**  
**(208/230 volt only)**

Line voltage connections are made to circuit breakers CB1, CB2, and CB3 in the electric heat sections with circuit breakers (designated by CB in the model numbers) then routed to the CB unit through J/P2 . Tables 1 through 4 show the amp rating for each circuit breaker used. Single-phase electric heat uses two-pole circuit breakers; while three-phase electric heat uses three-pole circuit breakers.

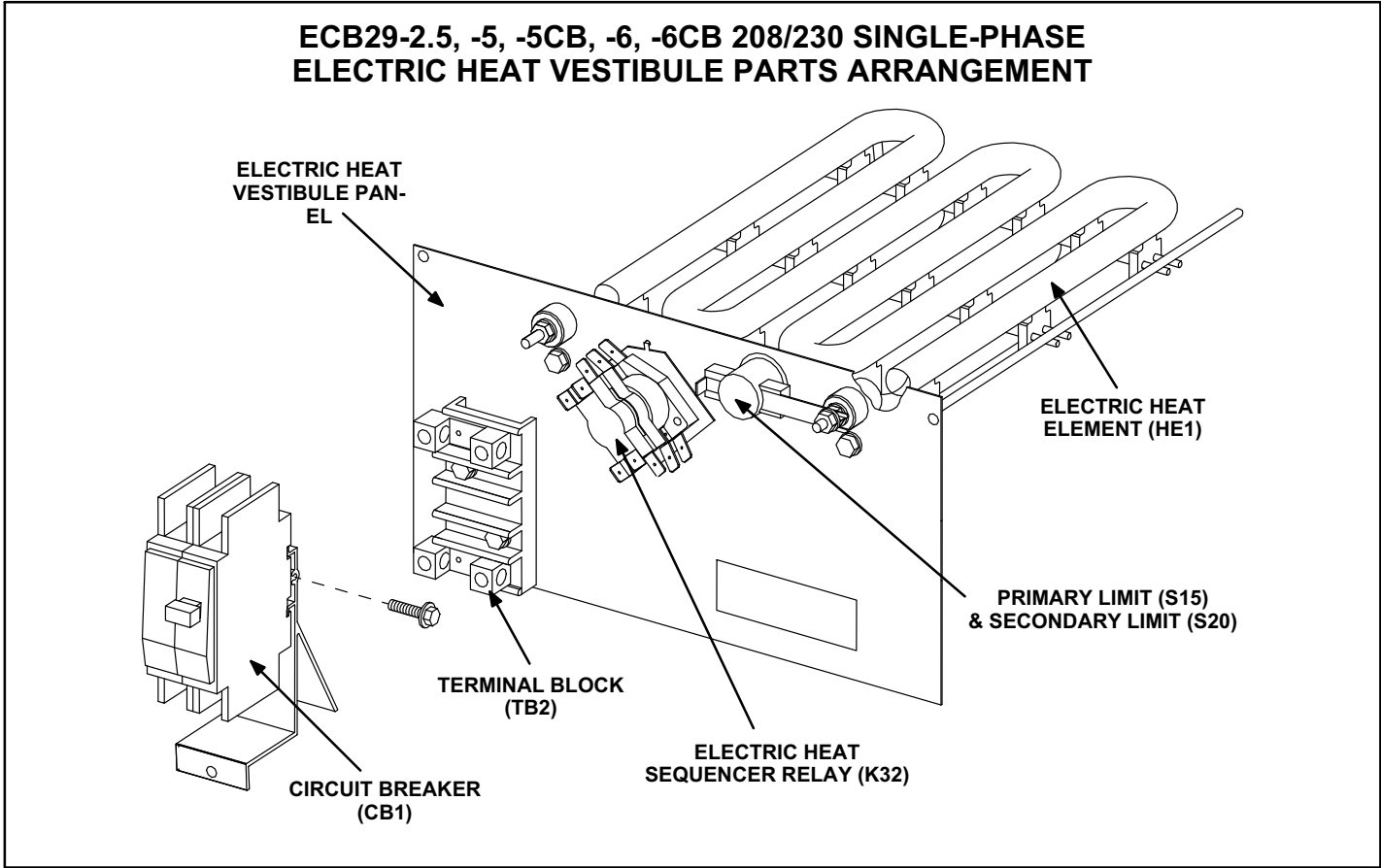
**Terminal Strip (TB2) 208/230 volt only)**

For the electric heat sections without circuit breakers or fuses, line voltage connections are made to terminal

strip TB2 then routed to the CB unit through J/P2 The terminal strip is located in the lower left corner of the electric heat vestibule panel. Single-phase electric heat uses two-pole terminal strips; while three-phase electric heat uses three- pole terminal strips.

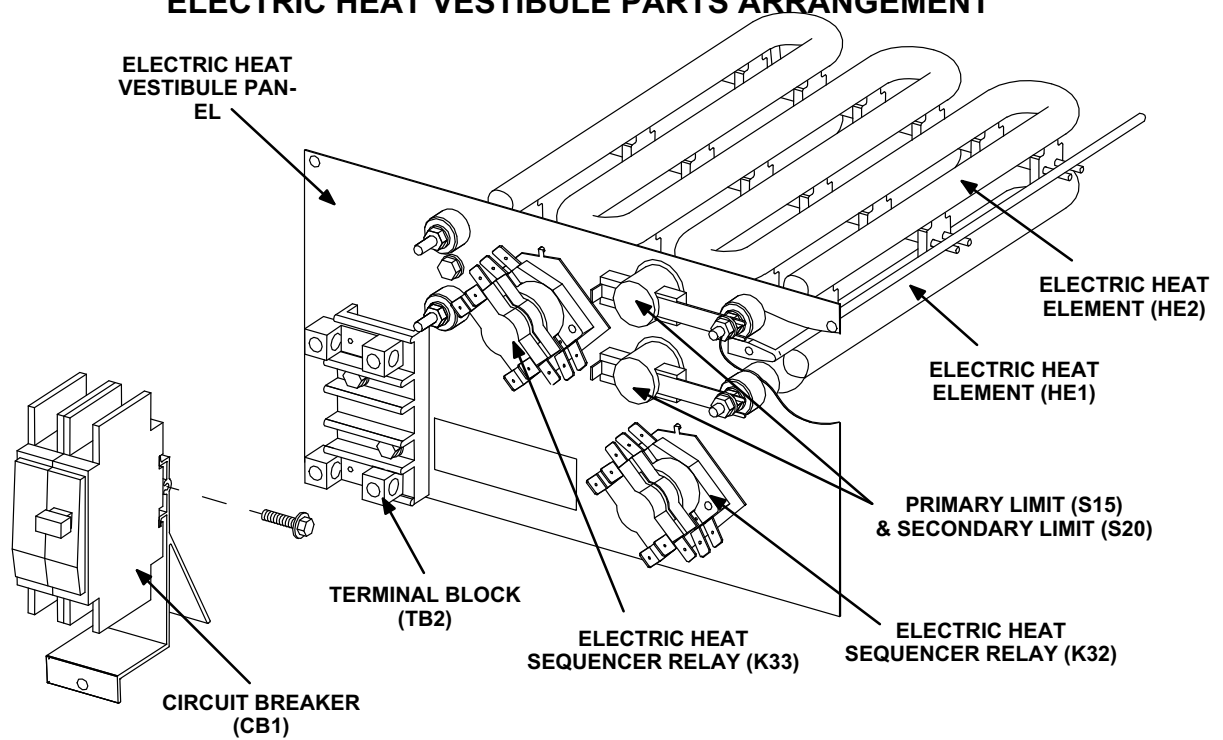
**Heating Elements (HE1 through HE6)**

Heating elements are composed of helix wound bare nichrome wire exposed directly to the air stream. The elements are supported by insulators mounted to the wire frame. For single-phase applications, one element is used per stage. Each stage is energized independently by the corresponding relay located on the electric heat vestibule panel. All three-phase heating elements are arranged in a three-phase delta. Once energized, heat transfer is instantaneous. High temperature protection is provided by primary and secondary high temperature limits.



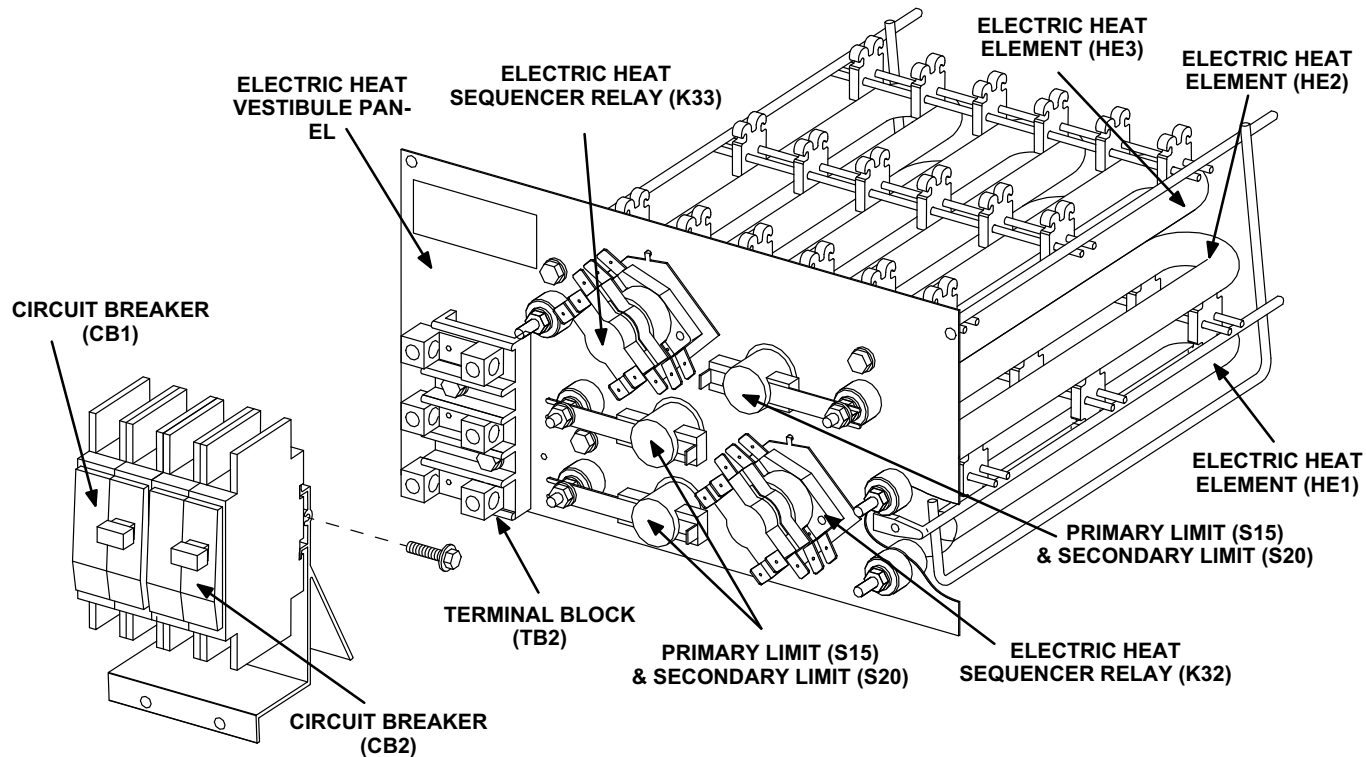
**FIGURE 5**

**ECB29-8, -8CB, 9CB, -10, -10CB 208/230  
SINGLE-PHASE  
ELECTRIC HEAT VESTIBULE PARTS ARRANGEMENT**



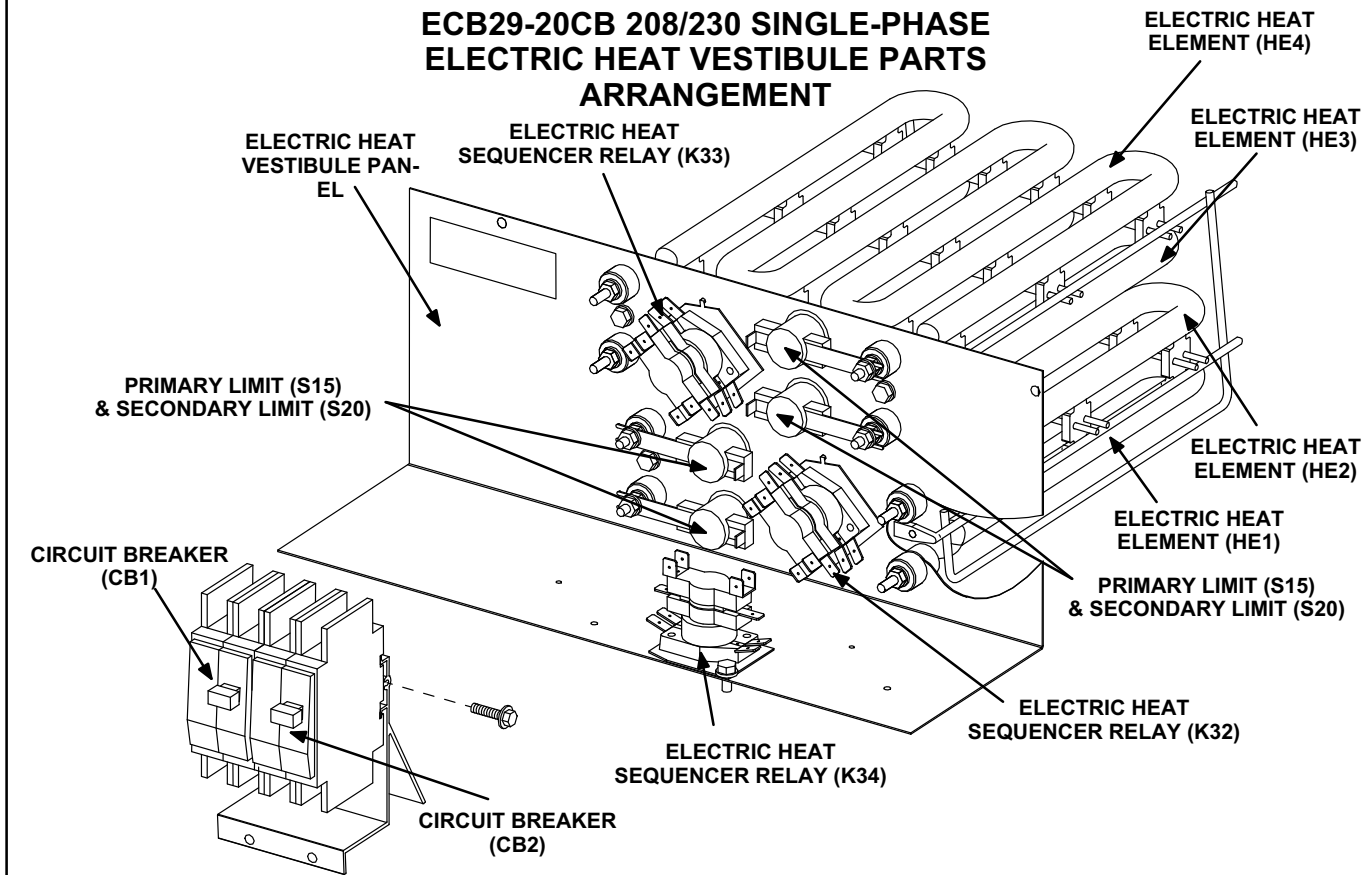
**FIGURE 6**

**ECB29-8, -10 208/230 THREE-PHASE  
ECB29-12.5CB, -15CB 208/230 SINGLE & THREE-PHASE  
ELECTRIC HEAT VESTIBULE PARTS ARRANGEMENT**



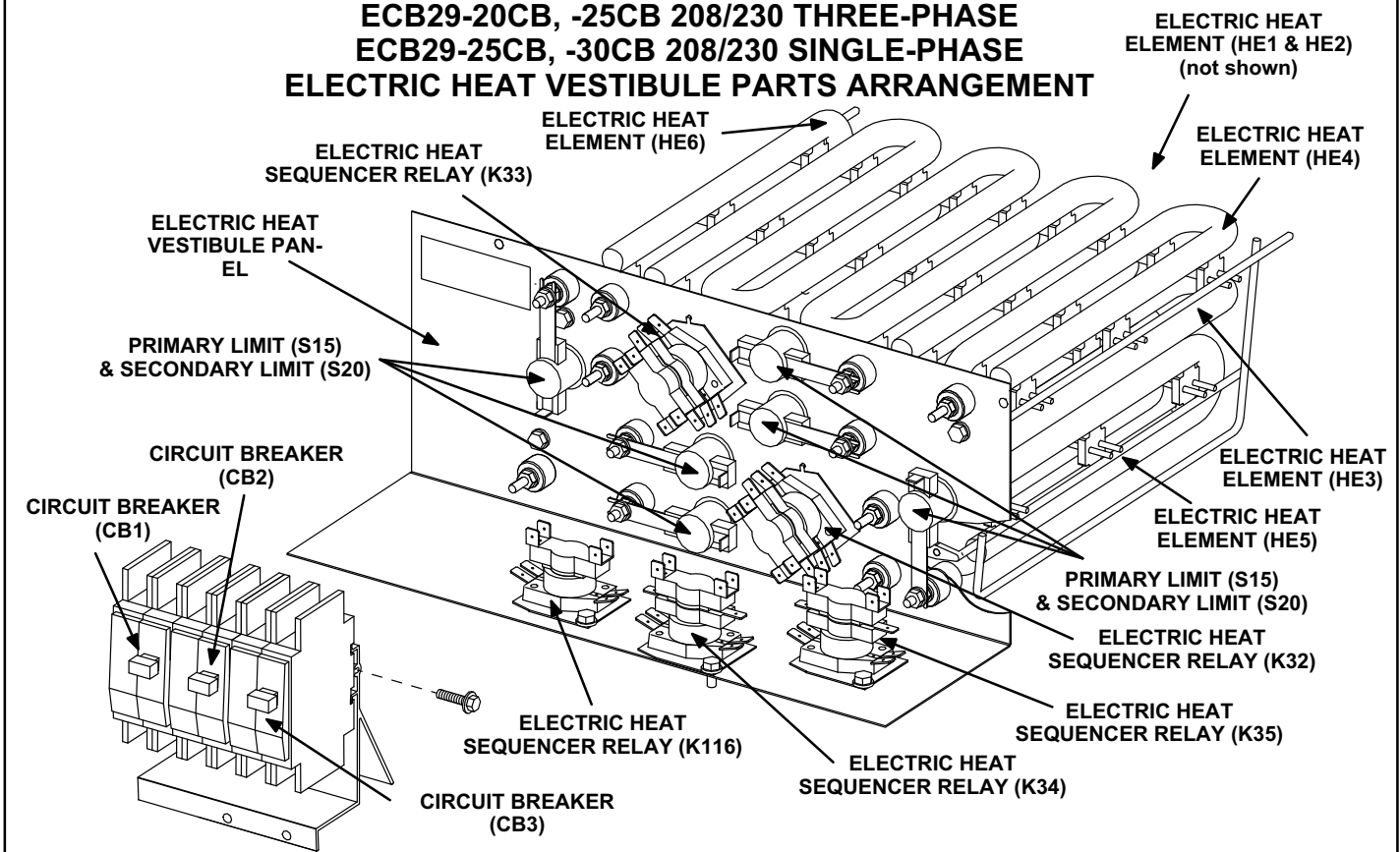
**FIGURE 7**

# **ECB29-20CB 208/230 SINGLE-PHASE ELECTRIC HEAT VESTIBULE PARTS ARRANGEMENT**



**FIGURE 8**

**ECB29-20CB, -25CB 208/230 THREE-PHASE  
ECB29-25CB, -30CB 208/230 SINGLE-PHASE  
ELECTRIC HEAT VESTIBULE PARTS ARRANGEMENT**



**FIGURE 9**

TABLE 1

| ELECTRIC HEAT DATA - CB(X)27UH-018 |                                                                              |               |       |      |                   |                                          |                                       |                                             |
|------------------------------------|------------------------------------------------------------------------------|---------------|-------|------|-------------------|------------------------------------------|---------------------------------------|---------------------------------------------|
| Model Number                       |                                                                              | No. of Stages | Input |      |                   | <sup>2</sup> Blower Motor Full Load Amps | <sup>3</sup> Minimum Circuit Ampacity | <sup>5</sup> Maximum Overcurrent Protection |
|                                    |                                                                              |               | Volts | kW   | <sup>1</sup> Btuh |                                          |                                       |                                             |
| SINGLE PHASE                       |                                                                              |               |       |      |                   |                                          |                                       |                                             |
| 2.5 kW<br>4 lbs.                   | ECB29-2.5 (28K30) Terminal Block                                             | 1             | 208   | 1.9  | 6,400             | 4.1                                      | 16                                    | 20                                          |
|                                    |                                                                              |               | 220   | 2.1  | 7,200             | 4.1                                      | 18                                    | 20                                          |
|                                    |                                                                              |               | 230   | 2.3  | 7,800             | 4.1                                      | 18                                    | 20                                          |
|                                    |                                                                              |               | 240   | 2.5  | 8,500             | 4.1                                      | 18                                    | 20                                          |
| 4 kW<br>4 lbs.                     | ECB29-4 (55W87) Terminal Block<br>ECB29-4CB (55W88)<br>30A Circuit breaker   | 1             | 208   | 3.0  | 10,250            | 4.1                                      | 23                                    | <sup>4</sup> 25                             |
|                                    |                                                                              |               | 220   | 3.4  | 11,450            | 4.1                                      | 26                                    | 30                                          |
|                                    |                                                                              |               | 230   | 3.7  | 12,550            | 4.1                                      | 26                                    | 30                                          |
|                                    |                                                                              |               | 240   | 4.0  | 13,650            | 4.1                                      | 26                                    | 30                                          |
| 5 kW<br>4 lbs.                     | ECB29-5 (28K31) Terminal Block<br>ECB29-5CB (28K32)<br>30A Circuit breaker   | 1             | 208   | 3.8  | 12,800            | 4.1                                      | 28                                    | 30                                          |
|                                    |                                                                              |               | 220   | 4.2  | 14,300            | 4.1                                      | 31                                    | <sup>4</sup> 35                             |
|                                    |                                                                              |               | 230   | 4.6  | 15,700            | 4.1                                      | 31                                    | <sup>4</sup> 35                             |
|                                    |                                                                              |               | 240   | 5.0  | 17,100            | 4.1                                      | 31                                    | <sup>4</sup> 35                             |
| 6 kW<br>4 lbs.                     | ECB29-6 (47L22) Terminal Block<br>ECB29-6CB (47L23)<br>35A Circuit breaker   | 1             | 208   | 4.5  | 15,400            | 4.1                                      | 32                                    | 35                                          |
|                                    |                                                                              |               | 220   | 5.0  | 17,100            | 4.1                                      | 36                                    | <sup>4</sup> 40                             |
|                                    |                                                                              |               | 230   | 5.5  | 18,800            | 4.1                                      | 36                                    | <sup>4</sup> 40                             |
|                                    |                                                                              |               | 240   | 6.0  | 20,500            | 4.1                                      | 36                                    | <sup>4</sup> 40                             |
| 8 kW<br>5 lbs.                     | ECB29-8 (28K33) Terminal Block<br>ECB29-8CB (28K34)<br>45A Circuit breaker   | 1             | 208   | 6.0  | 20,500            | 4.1                                      | 41                                    | 45                                          |
|                                    |                                                                              |               | 220   | 6.7  | 22,900            | 4.1                                      | 47                                    | <sup>4</sup> 50                             |
|                                    |                                                                              |               | 230   | 7.3  | 25,100            | 4.1                                      | 47                                    | <sup>4</sup> 50                             |
|                                    |                                                                              |               | 240   | 8.0  | 27,300            | 4.1                                      | 47                                    | <sup>4</sup> 50                             |
| 9 kW<br>5 lbs.                     | ECB29-9CB (10L11)<br>ECB29EH-9CB (91K67)<br>50A Circuit breaker              | 2             | 208   | 6.8  | 23,100            | 4.1                                      | 46                                    | 50                                          |
|                                    |                                                                              |               | 220   | 7.6  | 25,800            | 4.1                                      | 52                                    | <sup>4</sup> 60                             |
|                                    |                                                                              |               | 230   | 8.3  | 28,200            | 4.1                                      | 52                                    | <sup>4</sup> 60                             |
|                                    |                                                                              |               | 240   | 9.0  | 30,700            | 4.1                                      | 52                                    | <sup>4</sup> 60                             |
| 10 kW<br>6 lbs.                    | ECB29-10 (28K35) Terminal Block<br>ECB29-10CB (28K36)<br>60A Circuit breaker | 2             | 208   | 7.5  | 25,600            | 4.1                                      | 50                                    | <sup>4</sup> 50                             |
|                                    |                                                                              |               | 220   | 8.4  | 28,700            | 4.1                                      | 57                                    | 60                                          |
|                                    |                                                                              |               | 230   | 9.2  | 31,400            | 4.1                                      | 57                                    | 60                                          |
|                                    |                                                                              |               | 240   | 10.0 | 34,100            | 4.1                                      | 57                                    | 60                                          |

NOTE - Circuit 1 Minimum Circuit Ampacity includes the Blower Motor Full Load Amps.

1 Electric heater capacity only - does not include additional blower motor heat capacity.

2 Amps shown are for blower motor only.

3 Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 167°F.

4 Bold text indicates that the circuit breaker on "CB" circuit breaker models must be replaced with size noted. See Table on Page <?>.

5 HACR type circuit breaker or fuse.

**TABLE 2**

| ELECTRIC HEAT DATA - CB(X)27UH-024 |                                                                                                        |               |       |      |        |                               |                            |       |                                  |       |                            |                                  |
|------------------------------------|--------------------------------------------------------------------------------------------------------|---------------|-------|------|--------|-------------------------------|----------------------------|-------|----------------------------------|-------|----------------------------|----------------------------------|
| Model Number                       |                                                                                                        | No. of Stages | Input |      |        | 2 Blower Motor Full Load Amps | 3 Minimum Circuit Ampacity |       | 5 Maximum Overcurrent Protection |       | Single Point Power Source  |                                  |
|                                    |                                                                                                        |               | Volts | kW   | 1 Btuh |                               | Ckt 1                      | Ckt 2 | Ckt 1                            | Ckt 2 | 3 Minimum Circuit Ampacity | 5 Maximum Overcurrent Protection |
| SINGLE PHASE                       |                                                                                                        |               |       |      |        |                               |                            |       |                                  |       |                            |                                  |
| 4 kW<br>4 lbs.                     | ECB29-4 (55W87)<br>Terminal Block<br>ECB29-4CB (55W88)<br>30A Circuit breaker                          | 1             | 208   | 3.0  | 10,250 | 4.1                           | 23                         | ---   | 4 25                             | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 220   | 3.4  | 11,450 | 4.1                           | 26                         | ---   | 30                               | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 230   | 3.7  | 12,550 | 4.1                           | 26                         | ---   | 30                               | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 240   | 4.0  | 13,650 | 4.1                           | 26                         | ---   | 30                               | ---   | ---                        | ---                              |
| 5 kW<br>4 lbs.                     | ECB29-5 (28K31)<br>Terminal Block<br>ECB29-5CB (28K32)<br>30A Circuit breaker                          | 1             | 208   | 3.8  | 12,800 | 4.1                           | 28                         | ---   | 30                               | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 220   | 4.2  | 14,300 | 4.1                           | 31                         | ---   | 4 35                             | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 230   | 4.6  | 15,700 | 4.1                           | 31                         | ---   | 4 35                             | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 240   | 5.0  | 17,100 | 4.1                           | 31                         | ---   | 4 35                             | ---   | ---                        | ---                              |
| 6 kW<br>4 lbs.                     | ECB29-6 (47L22)<br>Terminal Block<br>ECB29-6CB (47L23)<br>35A Circuit breaker                          | 1             | 208   | 4.5  | 15,400 | 4.1                           | 32                         | ---   | 35                               | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 220   | 5.0  | 17,100 | 4.1                           | 36                         | ---   | 4 40                             | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 230   | 5.5  | 18,800 | 4.1                           | 36                         | ---   | 4 40                             | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 240   | 6.0  | 20,500 | 4.1                           | 36                         | ---   | 4 40                             | ---   | ---                        | ---                              |
| 8 kW<br>5 lbs.                     | ECB29-8 (28K33)<br>Terminal Block<br>ECB29-8CB (28K34)<br>45A Circuit breaker                          | 1             | 208   | 6.0  | 20,500 | 4.1                           | 41                         | ---   | 45                               | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 220   | 6.7  | 22,900 | 4.1                           | 47                         | ---   | 4 50                             | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 230   | 7.3  | 25,100 | 4.1                           | 47                         | ---   | 4 50                             | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 240   | 8.0  | 27,300 | 4.1                           | 47                         | ---   | 4 50                             | ---   | ---                        | ---                              |
| 9 kW<br>5 lbs.                     | ECB29-9CB (10L11)<br>ECB29EH-9CB (91K67)<br>50A Circuit breaker                                        | 2             | 208   | 6.8  | 23,100 | 4.1                           | 46                         | ---   | 50                               | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 220   | 7.6  | 25,800 | 4.1                           | 52                         | ---   | 4 60                             | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 230   | 8.3  | 28,200 | 4.1                           | 52                         | ---   | 4 60                             | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 240   | 9.0  | 30,700 | 4.1                           | 52                         | ---   | 4 60                             | ---   | ---                        | ---                              |
| 10 kW<br>6 lbs.                    | ECB29-10 (28K35)<br>Terminal Block<br>ECB29-10CB (28K36)<br>60A Circuit breaker                        | 2             | 208   | 7.5  | 25,600 | 4.1                           | 50                         | ---   | 4 50                             | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 220   | 8.4  | 28,700 | 4.1                           | 57                         | ---   | 60                               | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 230   | 9.2  | 31,400 | 4.1                           | 57                         | ---   | 60                               | ---   | ---                        | ---                              |
|                                    |                                                                                                        |               | 240   | 10.0 | 34,100 | 4.1                           | 57                         | ---   | 60                               | ---   | ---                        | ---                              |
| 12.5 kW<br>10 lbs.                 | ECB29-12.5CB (28K37)<br>ECB29EH-12.5CB (91K68)<br>(1) 25A Circuit breaker<br>& (1) 50A Circuit breaker | 2             | 208   | 9.4  | 32,000 | 4.1                           | 24                         | 38    | 25                               | 4 40  | 70                         | 70                               |
|                                    |                                                                                                        |               | 220   | 10.5 | 35,800 | 4.1                           | 27                         | 43    | 4 30                             | 4 45  | 70                         | 70                               |
|                                    |                                                                                                        |               | 230   | 11.5 | 39,200 | 4.1                           | 27                         | 43    | 4 30                             | 4 45  | 70                         | 70                               |
|                                    |                                                                                                        |               | 240   | 12.5 | 42,600 | 4.1                           | 27                         | 43    | 4 30                             | 4 45  | 70                         | 70                               |
| 15 kW<br>12 lbs.                   | ECB29-15CB (28K38)<br>ECB29EH-15CB (91K69)<br>(1) 30A Circuit breaker<br>& (1) 60A Circuit breaker     | 2             | 208   | 11.3 | 38,400 | 4.1                           | 28                         | 45    | 30                               | 4 45  | 83                         | 90                               |
|                                    |                                                                                                        |               | 220   | 12.6 | 43,000 | 4.1                           | 31                         | 52    | 4 35                             | 60    | 83                         | 90                               |
|                                    |                                                                                                        |               | 230   | 13.8 | 47,000 | 4.1                           | 31                         | 52    | 4 35                             | 60    | 83                         | 90                               |
|                                    |                                                                                                        |               | 240   | 15.0 | 51,200 | 4.1                           | 31                         | 52    | 4 35                             | 60    | 83                         | 90                               |

NOTE - Circuit 1 Minimum Circuit Ampacity includes the Blower Motor Full Load Amps.

1 Electric heater capacity only - does not include additional blower motor heat capacity.

2 Amps shown are for blower motor only.

3 Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 167°F.

4 Bold text indicates that the circuit breaker on "CB" circuit breaker models must be replaced with size noted. See Table on Page <?>.

5 HACR type circuit breaker or fuse.



**TABLE 3**

| ELECTRIC HEAT DATA - CB(X)27UH-030 |                                                                                                        |               |       |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
|------------------------------------|--------------------------------------------------------------------------------------------------------|---------------|-------|------|-------------------|------------------------------------------|---------------------------------------|-------|---------------------------------------------|-----------------|---------------------------------------|---------------------------------------------|
| Model Number                       |                                                                                                        | No. of Stages | Input |      |                   | <sup>2</sup> Blower Motor Full Load Amps | <sup>3</sup> Minimum Circuit Ampacity |       | <sup>5</sup> Maximum Overcurrent Protection |                 | Single Point Power Source             |                                             |
|                                    |                                                                                                        |               | Volts | kW   | <sup>1</sup> Btuh |                                          | Ckt 1                                 | Ckt 2 | Ckt 1                                       | Ckt 2           | <sup>3</sup> Minimum Circuit Ampacity | <sup>5</sup> Maximum Overcurrent Protection |
| SINGLE PHASE                       |                                                                                                        |               |       |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
| 4 kW<br>4 lbs.                     | ECB29-4 (55W87)<br>Terminal Block<br>ECB29-4CB (55W88)<br>30A Circuit breaker                          | 1             | 208   | 3.0  | 10,250            | 4.1                                      | 23                                    | ---   | <sup>4</sup> 25                             | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 220   | 3.4  | 11,450            | 4.1                                      | 26                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 230   | 3.7  | 12,550            | 4.1                                      | 26                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 240   | 4.0  | 13,650            | 4.1                                      | 26                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
| 5 kW<br>4 lbs.                     | ECB29-5 (28K31)<br>Terminal Block<br>ECB29-5CB (28K32)<br>30A Circuit breaker                          | 1             | 208   | 3.8  | 12,800            | 4.1                                      | 28                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 220   | 4.2  | 14,300            | 4.1                                      | 31                                    | ---   | <sup>4</sup> 35                             | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 230   | 4.6  | 15,700            | 4.1                                      | 31                                    | ---   | <sup>4</sup> 35                             | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 240   | 5.0  | 17,100            | 4.1                                      | 31                                    | ---   | <sup>4</sup> 35                             | ---             | ---                                   | ---                                         |
| 6 kW<br>4 lbs.                     | ECB29-6 (47L22)<br>Terminal Block<br>ECB29-6CB (47L23)<br>35A Circuit breaker                          | 1             | 208   | 4.5  | 15,400            | 4.1                                      | 32                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 220   | 5.0  | 17,100            | 4.1                                      | 36                                    | ---   | <sup>4</sup> 40                             | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 230   | 5.5  | 18,800            | 4.1                                      | 36                                    | ---   | <sup>4</sup> 40                             | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 240   | 6.0  | 20,500            | 4.1                                      | 36                                    | ---   | <sup>4</sup> 40                             | ---             | ---                                   | ---                                         |
| 8 kW<br>5 lbs.                     | ECB29-8 (28K33)<br>Terminal Block<br>ECB29-8CB (28K34)<br>45A Circuit breaker                          | 1             | 208   | 6.0  | 20,500            | 4.1                                      | 41                                    | ---   | 45                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 220   | 6.7  | 22,900            | 4.1                                      | 47                                    | ---   | <sup>4</sup> 50                             | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 230   | 7.3  | 25,100            | 4.1                                      | 47                                    | ---   | <sup>4</sup> 50                             | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 240   | 8.0  | 27,300            | 4.1                                      | 47                                    | ---   | <sup>4</sup> 50                             | ---             | ---                                   | ---                                         |
| 9 kW<br>5 lbs.                     | ECB29-9CB (10L11)<br>50A Circuit breaker<br>ECB29EH-9CB (91K67)<br>50A Circuit breaker                 | 2             | 208   | 6.8  | 25,600            | 4.1                                      | 46                                    | ---   | 50                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 220   | 7.6  | 28,700            | 4.1                                      | 52                                    | ---   | <sup>4</sup> 60                             | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 230   | 8.3  | 31,400            | 4.1                                      | 52                                    | ---   | <sup>4</sup> 60                             | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 240   | 9.0  | 34,100            | 4.1                                      | 52                                    | ---   | <sup>4</sup> 60                             | ---             | ---                                   | ---                                         |
| 10 kW<br>6 lbs.                    | ECB29-10 (28K35)<br>Terminal Block<br>ECB29-10CB (28K36)<br>60A Circuit breaker                        | 2             | 208   | 7.5  | 25,600            | 4.1                                      | 50                                    | ---   | <sup>4</sup> 50                             | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 220   | 8.4  | 28,700            | 4.1                                      | 57                                    | ---   | 60                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 230   | 9.2  | 31,400            | 4.1                                      | 57                                    | ---   | 60                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 240   | 10.0 | 34,100            | 4.1                                      | 57                                    | ---   | 60                                          | ---             | ---                                   | ---                                         |
| 12.5 kW<br>10 lbs.                 | ECB29-12.5CB (28K37)<br>ECB29EH-12.5CB (91K68)<br>(1) 25A Circuit breaker<br>& (1) 50A Circuit breaker | 2             | 208   | 9.4  | 32,000            | 4.1                                      | 24                                    | 38    | 25                                          | <sup>4</sup> 40 | 70                                    | 70                                          |
|                                    |                                                                                                        |               | 220   | 10.5 | 35,800            | 4.1                                      | 27                                    | 43    | <sup>4</sup> 30                             | <sup>4</sup> 45 | 70                                    | 70                                          |
|                                    |                                                                                                        |               | 230   | 11.5 | 39,200            | 4.1                                      | 27                                    | 43    | <sup>4</sup> 30                             | <sup>4</sup> 45 | 70                                    | 70                                          |
|                                    |                                                                                                        |               | 240   | 12.5 | 42,600            | 4.1                                      | 27                                    | 43    | <sup>4</sup> 30                             | <sup>4</sup> 45 | 70                                    | 70                                          |
| 15 kW<br>12 lbs.                   | ECB29-15CB (28K38)<br>ECB29EH-15CB (91K69)<br>(1) 30A Circuit breaker<br>& (1) 60A Circuit Breaker     | 2             | 208   | 11.3 | 38,400            | 4.1                                      | 28                                    | 45    | 30                                          | <sup>4</sup> 45 | 83                                    | 90                                          |
|                                    |                                                                                                        |               | 220   | 12.6 | 43,000            | 4.1                                      | 31                                    | 52    | <sup>4</sup> 35                             | 60              | 83                                    | 90                                          |
|                                    |                                                                                                        |               | 230   | 13.8 | 47,000            | 4.1                                      | 31                                    | 52    | <sup>4</sup> 35                             | 60              | 83                                    | 90                                          |
|                                    |                                                                                                        |               | 240   | 15.0 | 51,200            | 4.1                                      | 31                                    | 52    | <sup>4</sup> 35                             | 60              | 83                                    | 90                                          |
| THREE PHASE                        |                                                                                                        |               |       |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
| 8 kW<br>5 lbs.                     | ECB29-8 (28K42)<br>Terminal Block                                                                      | 1             | 208   | 6.0  | 20,500            | 4.1                                      | 26                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 220   | 6.7  | 22,900            | 4.1                                      | 29                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 230   | 7.3  | 25,100            | 4.1                                      | 29                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 240   | 8.0  | 27,300            | 4.1                                      | 29                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
| 10 kW<br>6 lbs.                    | ECB29-10 (28K43)<br>Terminal Block                                                                     | 1             | 208   | 7.5  | 25,600            | 4.1                                      | 31                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 220   | 8.4  | 28,700            | 4.1                                      | 35                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 230   | 9.2  | 31,400            | 4.1                                      | 35                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 240   | 10.0 | 34,100            | 4.1                                      | 35                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
| 15 kW<br>12 lbs.                   | ECB29-15CB (28K44)<br>(1) 50A Circuit breaker                                                          | 1             | 208   | 11.3 | 38,400            | 4.1                                      | 44                                    | ---   | 45                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 220   | 12.6 | 43,000            | 4.1                                      | 50                                    | ---   | 50                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 230   | 13.5 | 47,000            | 4.1                                      | 50                                    | ---   | 50                                          | ---             | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 240   | 15.0 | 51,200            | 4.1                                      | 50                                    | ---   | 50                                          | ---             | ---                                   | ---                                         |

NOTE - Circuit 1 Minimum Circuit Ampacity includes the Blower Motor Full Load Amps.

1 Electric heater capacity only - does not include additional blower motor heat capacity.

2 Amps shown are for blower motor only.

3 Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 167°F.

4 Bold text indicates that the circuit breaker on "CB" circuit breaker models must be replaced with size noted. See Table on Page <?>.

5 HACR type circuit breaker or fuse.

**TABLE 4**

| <b>ELECTRIC HEAT DATA - CB(X)27UH-042</b> |                                                                                                            |               |             |          |              |                               |                            |       |       |                                  |       |       |                            |                                  |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------|-------------|----------|--------------|-------------------------------|----------------------------|-------|-------|----------------------------------|-------|-------|----------------------------|----------------------------------|
| <b>SINGLE PHASE</b>                       |                                                                                                            |               |             |          |              |                               |                            |       |       |                                  |       |       |                            |                                  |
| Model Number                              |                                                                                                            | No. of Stages | Volts Input | kW Input | 1 Btuh Input | 2 Blower Motor Full Load Amps | 3 Minimum Circuit Ampacity |       |       | 5 Maximum Overcurrent Protection |       |       | Single Point Power Source  |                                  |
|                                           |                                                                                                            |               |             |          |              |                               | Ckt 1                      | Ckt 2 | Ckt 3 | Ckt 1                            | Ckt 2 | Ckt 3 | 3 Minimum Circuit Ampacity | 5 Maximum Overcurrent Protection |
| 4 kW<br>4 lbs.                            | ECB29-4 (55W87)<br>Terminal Block<br>ECB29-4CB (55W88)<br>30A Circuit breaker                              | 1             | 208         | 3.0      | 10,250       | 7.6                           | 28                         | ---   | ---   | 30                               | ---   | ---   | ---                        | ---                              |
|                                           |                                                                                                            |               | 220         | 3.4      | 11,450       | 7.6                           | 30                         | ---   | ---   | 30                               | ---   | ---   | ---                        | ---                              |
|                                           |                                                                                                            |               | 230         | 3.7      | 12,550       | 7.6                           | 30                         | ---   | ---   | 30                               | ---   | ---   | ---                        | ---                              |
|                                           |                                                                                                            |               | 240         | 4.0      | 13,650       | 7.6                           | 30                         | ---   | ---   | 30                               | ---   | ---   | ---                        | ---                              |
| 5 kW<br>4 lbs.                            | ECB29-5 (28K31)<br>Terminal Block<br>ECB29-5CB (28K32)<br>30A Circuit breaker                              | 1             | 208         | 3.8      | 12,800       | 7.6                           | 32                         | ---   | ---   | 4 35                             | ---   | ---   | ---                        | ---                              |
|                                           |                                                                                                            |               | 220         | 4.2      | 14,300       | 7.6                           | 36                         | ---   | ---   | 4 40                             | ---   | ---   | ---                        | ---                              |
|                                           |                                                                                                            |               | 230         | 4.6      | 15,700       | 7.6                           | 36                         | ---   | ---   | 4 40                             | ---   | ---   | ---                        | ---                              |
|                                           |                                                                                                            |               | 240         | 5.0      | 17,100       | 7.6                           | 36                         | ---   | ---   | 4 40                             | ---   | ---   | ---                        | ---                              |
| 6 kW<br>4 lbs.                            | ECB29-6 (47L22)<br>Terminal Block<br>ECB29-6CB (47L23)<br>35A Circuit breaker                              | 1             | 208         | 4.5      | 15,400       | 7.6                           | 37                         | ---   | ---   | 4 40                             | ---   | ---   | ---                        | ---                              |
|                                           |                                                                                                            |               | 220         | 5.0      | 17,100       | 7.6                           | 41                         | ---   | ---   | 4 45                             | ---   | ---   | ---                        | ---                              |
|                                           |                                                                                                            |               | 230         | 5.5      | 18,800       | 7.6                           | 41                         | ---   | ---   | 4 45                             | ---   | ---   | ---                        | ---                              |
|                                           |                                                                                                            |               | 240         | 6.0      | 20,500       | 7.6                           | 41                         | ---   | ---   | 4 45                             | ---   | ---   | ---                        | ---                              |
| 8 kW<br>5 lbs.                            | ECB29-8 (28K33)<br>Terminal Block<br>ECB29-8CB (28K34)<br>45A Circuit breaker                              | 1             | 208         | 6.0      | 20,500       | 7.6                           | 46                         | ---   | ---   | 4 50                             | ---   | ---   | ---                        | ---                              |
|                                           |                                                                                                            |               | 220         | 6.7      | 22,900       | 7.6                           | 51                         | ---   | ---   | 4 60                             | ---   | ---   | ---                        | ---                              |
|                                           |                                                                                                            |               | 230         | 7.3      | 25,100       | 7.6                           | 51                         | ---   | ---   | 4 60                             | ---   | ---   | ---                        | ---                              |
|                                           |                                                                                                            |               | 240         | 8.0      | 27,300       | 7.6                           | 51                         | ---   | ---   | 4 60                             | ---   | ---   | ---                        | ---                              |
| 9 kW<br>5 lbs.                            | ECB29-9CB (10L11)<br>50A Circuit breaker<br>ECB29EH-9CB (91K67)<br>50A Circuit breaker                     | 2             | 208         | 6.8      | 25,600       | 7.6                           | 50                         | ---   | ---   | 50                               | ---   | ---   | ---                        | ---                              |
|                                           |                                                                                                            |               | 220         | 7.6      | 28,700       | 7.6                           | 56                         | ---   | ---   | 4 60                             | ---   | ---   | ---                        | ---                              |
|                                           |                                                                                                            |               | 230         | 8.3      | 31,400       | 7.6                           | 56                         | ---   | ---   | 4 60                             | ---   | ---   | ---                        | ---                              |
|                                           |                                                                                                            |               | 240         | 9.0      | 34,100       | 7.6                           | 56                         | ---   | ---   | 4 60                             | ---   | ---   | ---                        | ---                              |
| 12.5 kW<br>10 lbs.                        | ECB29-12.5CB (28K37)<br>ECB29EH-12.5CB (91K68)<br>(1) 25A Circuit breaker<br>and<br>1) 50A Circuit breaker | 2             | 208         | 9.4      | 32,000       | 7.6                           | 28                         | 38    | ---   | 4 30                             | 4 40  | ---   | 75                         | 80                               |
|                                           |                                                                                                            |               | 220         | 10.5     | 35,800       | 7.6                           | 31                         | 43    | ---   | 4 35                             | 4 45  | ---   | 75                         | 80                               |
|                                           |                                                                                                            |               | 230         | 11.5     | 39,200       | 7.6                           | 31                         | 43    | ---   | 4 35                             | 4 45  | ---   | 75                         | 80                               |
|                                           |                                                                                                            |               | 240         | 12.5     | 42,600       | 7.6                           | 31                         | 43    | ---   | 4 35                             | 4 45  | ---   | 75                         | 80                               |

| ELECTRIC HEAT DATA - CB(X)27UH-042 (Continued) |                                                                                                      |               |             |          |                         |                                          |                                       |       |       |                                             |                 |                 |                                       |                                             |
|------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------|-------------|----------|-------------------------|------------------------------------------|---------------------------------------|-------|-------|---------------------------------------------|-----------------|-----------------|---------------------------------------|---------------------------------------------|
| SINGLE PHASE                                   |                                                                                                      |               |             |          |                         |                                          |                                       |       |       |                                             |                 |                 |                                       |                                             |
| Model Number                                   |                                                                                                      | No. of Stages | Volts Input | kW Input | <sup>1</sup> Btuh Input | <sup>2</sup> Blower Motor Full Load Amps | <sup>3</sup> Minimum Circuit Ampacity |       |       | <sup>5</sup> Maximum Overcurrent Protection |                 |                 | Single Point Power Source             |                                             |
|                                                |                                                                                                      |               |             |          |                         |                                          | Ckt 1                                 | Ckt 2 | Ckt 3 | Ckt 1                                       | Ckt 2           | Ckt 3           | <sup>3</sup> Minimum Circuit Ampacity | <sup>5</sup> Maximum Overcurrent Protection |
| 15 kW<br>12 lbs.                               | ECB29-15CB (28K38)<br>ECB29EH-15CB (91K69)<br>(1) 30A Circuit breaker and<br>(1) 60A Circuit breaker | 2             | 208         | 11.3     | 38,400                  | 7.6                                      | 32                                    | 45    | ---   | <sup>4</sup> 35                             | <sup>4</sup> 45 | ---             | 88                                    | 90                                          |
|                                                |                                                                                                      |               | 220         | 12.6     | 43,000                  | 7.6                                      | 36                                    | 52    | ---   | <sup>4</sup> 40                             | 60              | ---             | 88                                    | 90                                          |
|                                                |                                                                                                      |               | 230         | 13.5     | 47,000                  | 7.6                                      | 36                                    | 52    | ---   | <sup>4</sup> 40                             | 60              | ---             | 88                                    | 90                                          |
|                                                |                                                                                                      |               | 240         | 15.0     | 51,200                  | 7.6                                      | 36                                    | 52    | ---   | <sup>4</sup> 40                             | 60              | ---             | 88                                    | 90                                          |
| 20 kW<br>19 lbs.                               | ECB29-20CB (11L31)<br>ECB29EH-20CB (91K70)<br>(1) 50A Circuit breaker and<br>(1) 60A Circuit breaker | 2             | 208         | 15.0     | 51,200                  | 7.6                                      | 50                                    | 50    | ---   | 50                                          | <sup>4</sup> 50 | ---             | 114                                   | 125                                         |
|                                                |                                                                                                      |               | 220         | 16.8     | 57,300                  | 7.6                                      | 56                                    | 57    | ---   | <sup>4</sup> 60                             | 60              | ---             | 114                                   | 125                                         |
|                                                |                                                                                                      |               | 230         | 18.4     | 62,700                  | 7.6                                      | 56                                    | 57    | ---   | <sup>4</sup> 60                             | 60              | ---             | 114                                   | 125                                         |
|                                                |                                                                                                      |               | 240         | 20.0     | 68,200                  | 7.6                                      | 56                                    | 57    | ---   | <sup>4</sup> 60                             | 60              | ---             | 114                                   | 125                                         |
| 25 kW<br>19 lbs.                               | ECB29-25CB (28K40)<br>(3) 50A Circuit breakers                                                       | 3             | 208         | 18.8     | 64,100                  | 7.6                                      | 50                                    | 41    | 41    | 50                                          | <sup>4</sup> 45 | <sup>4</sup> 45 | 140                                   | 150                                         |
|                                                |                                                                                                      |               | 220         | 21.0     | 71,700                  | 7.6                                      | 53                                    | 43    | 43    | <sup>4</sup> 60                             | <sup>4</sup> 45 | <sup>4</sup> 45 | 140                                   | 150                                         |
|                                                |                                                                                                      |               | 230         | 23.0     | 78,300                  | 7.6                                      | 53                                    | 43    | 43    | <sup>4</sup> 60                             | <sup>4</sup> 45 | <sup>4</sup> 45 | 140                                   | 150                                         |
|                                                |                                                                                                      |               | 240         | 25.0     | 85,300                  | 7.6                                      | 53                                    | 43    | 43    | <sup>4</sup> 60                             | <sup>4</sup> 45 | <sup>4</sup> 45 | 140                                   | 150                                         |

NOTE - Circuit 1 Minimum Circuit Ampacity includes the Blower Motor Full Load Amps.

1 Electric heater capacity only - does not include additional blower motor heat capacity.

2 Amps shown are for blower motor only.

3 Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 167°F.

4 Bold text indicates that the circuit breaker on "CB" circuit breaker models must be replaced with size noted. See Table on Page <?>.

5 HACR type circuit breaker or fuse.

**TABLE 5**

| <b>ELECTRIC HEAT DATA - CB(X)27UH-042</b> |                                                |               |        |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
|-------------------------------------------|------------------------------------------------|---------------|--------|------|-------------------|------------------------------------------|---------------------------------------|-------|---------------------------------------------|-----------------|---------------------------------------|---------------------------------------------|
| THREE PHASE                               |                                                |               |        |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
| Model Number                              |                                                | No. of Stages | Input  |      |                   | <sup>2</sup> Blower Motor Full Load Amps | <sup>3</sup> Minimum Circuit Ampacity |       | <sup>5</sup> Maximum Overcurrent Protection |                 | Single Point Power Source             |                                             |
|                                           |                                                |               | Volt s | kW   | <sup>1</sup> Btuh |                                          | Ckt 1                                 | Ckt 2 | Ckt 1                                       | Ckt 2           | <sup>3</sup> Minimum Circuit Ampacity | <sup>5</sup> Maximum Overcurrent Protection |
| 8 kW<br>5 lbs.                            | ECB29-8 (28K42)<br>Terminal block              | 1             | 208    | 6.0  | 20,500            | 7.6                                      | 30                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 220    | 6.7  | 22,900            | 7.6                                      | 33                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 230    | 7.3  | 25,100            | 7.6                                      | 33                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 240    | 8.0  | 27,300            | 7.6                                      | 33                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
| 10 kW<br>6 lbs.                           | ECB29-10 (28K43)<br>Terminal Block             | 1             | 208    | 7.5  | 25,600            | 7.6                                      | 36                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 220    | 8.4  | 28,700            | 7.6                                      | 40                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 230    | 9.2  | 31,400            | 7.6                                      | 40                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 240    | 10.0 | 34,100            | 7.6                                      | 40                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                           | ECB29-10 (28K47)<br>(3) 20A Fuses              | 1             | 440    | 8.4  | 28,700            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 460    | 9.2  | 31,400            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 480    | 10.0 | 34,100            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
|                                           |                                                |               |        |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
| 15 kW<br>12 lbs.                          | ECB29-15CB (28K44)<br>50A Circuit breaker      | 1             | 208    | 11.3 | 38,400            | 7.6                                      | 49                                    | ---   | 50                                          | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 220    | 12.6 | 43,000            | 7.6                                      | 55                                    | ---   | <sup>4</sup> 60                             | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 230    | 13.5 | 47,000            | 7.6                                      | 55                                    | ---   | <sup>4</sup> 60                             | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 240    | 15.0 | 51,200            | 7.6                                      | 55                                    | ---   | <sup>4</sup> 60                             | ---             | ---                                   | ---                                         |
|                                           | ECB29-15 (28K48)<br>(3) 25A Fuses              | 1             | 440    | 12.6 | 43,000            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 460    | 13.5 | 47,000            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 480    | 15.0 | 51,200            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
|                                           |                                                |               |        |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
| 20 kW<br>19 lbs.                          | ECB29-20CB (28K45)<br>(2) 35A Circuit breaker  | 2             | 208    | 15.0 | 51,200            | 7.6                                      | 36                                    | 26    | <sup>4</sup> 40                             | <sup>4</sup> 30 | 70                                    | 70                                          |
|                                           |                                                |               | 220    | 16.8 | 57,300            | 7.6                                      | 40                                    | 30    | <sup>4</sup> 40                             | <sup>4</sup> 30 | 70                                    | 70                                          |
|                                           |                                                |               | 230    | 18.4 | 62,700            | 7.6                                      | 40                                    | 30    | <sup>4</sup> 40                             | <sup>4</sup> 30 | 70                                    | 70                                          |
|                                           |                                                |               | 240    | 20.0 | 68,200            | 7.6                                      | 40                                    | 30    | <sup>4</sup> 40                             | <sup>4</sup> 30 | 70                                    | 70                                          |
|                                           | ECB29-20 (28K49)<br>(3) 35A Fuses              | 1             | 440    | 16.8 | 57,300            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 460    | 18.4 | 62,700            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 480    | 20.0 | 68,200            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
|                                           | <sup>6</sup> ECB29-20 (28K51)<br>(3) 25A Fuses | 1             | 550    | 16.8 | 57,300            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 575    | 18.4 | 62,700            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 600    | 20.0 | 68,200            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
| 25 kW<br>19 lbs.                          | ECB29-25CB (28K46)<br>(2) 45A Circuit breaker  | 2             | 208    | 18.8 | 64,100            | 7.6                                      | 42                                    | 33    | <sup>4</sup> 50                             | <sup>4</sup> 35 | 85                                    | 90                                          |
|                                           |                                                |               | 220    | 21.0 | 71,700            | 7.6                                      | 47                                    | 38    | <sup>4</sup> 50                             | <sup>4</sup> 40 | 85                                    | 90                                          |
|                                           |                                                |               | 230    | 23.0 | 78,300            | 7.6                                      | 47                                    | 38    | <sup>4</sup> 50                             | <sup>4</sup> 40 | 85                                    | 90                                          |
|                                           |                                                |               | 240    | 25.0 | 85,300            | 7.6                                      | 47                                    | 38    | <sup>4</sup> 50                             | <sup>4</sup> 40 | 85                                    | 90                                          |
|                                           | ECB29-25 (28K50)<br>(3) 40A Fuses              | 1             | 440    | 21.0 | 71,700            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 460    | 23.0 | 78,300            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 480    | 25.0 | 85,300            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
|                                           | <sup>6</sup> ECB29-25 (28K52)<br>(3) 35A Fuses | 1             | 550    | 21.0 | 71,700            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 575    | 23.0 | 78,300            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |
|                                           |                                                |               | 600    | 25.0 | 85,300            | ---                                      | ---                                   | ---   | ---                                         | ---             | ---                                   | ---                                         |

NOTE - Circuit 1 Minimum Circuit Ampacity includes the Blower Motor Full Load Amps.

1 Electric heater capacity only - does not include additional blower motor heat capacity.

2 Amps shown are for blower motor only.

3 Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 167°F.

4 Bold text indicates that the circuit breaker on "CB" circuit breaker models must be replaced with size noted. See Table on Page <?>.

5 HACR type circuit breaker or fuse.

TABLE 6

| ELECTRIC HEAT DATA - CB(X)27UH-048 |                                                                                                        |               |       |      |                   |                                          |                                       |       |       |                                             |                 |       |                                       |                                             |
|------------------------------------|--------------------------------------------------------------------------------------------------------|---------------|-------|------|-------------------|------------------------------------------|---------------------------------------|-------|-------|---------------------------------------------|-----------------|-------|---------------------------------------|---------------------------------------------|
| SINGLE PHASE                       |                                                                                                        |               |       |      |                   |                                          |                                       |       |       |                                             |                 |       |                                       |                                             |
| Model Number                       |                                                                                                        | No. of Stages | Input |      |                   | <sup>2</sup> Blower Motor Full Load Amps | <sup>3</sup> Minimum Circuit Ampacity |       |       | <sup>5</sup> Maximum Overcurrent Protection |                 |       | Single Point Power Source             |                                             |
|                                    |                                                                                                        |               | Volts | kW   | <sup>1</sup> Btuh |                                          | Ckt 1                                 | Ckt 2 | Ckt 3 | Ckt 1                                       | Ckt 2           | Ckt 3 | <sup>3</sup> Minimum Circuit Ampacity | <sup>5</sup> Maximum Overcurrent Protection |
| 4 kW<br>4 lbs.                     | ECB29-4 (55W87)<br>Terminal Block<br>ECB29-4CB (55W88)<br>30A Circuit breaker                          | 1             | 208   | 3.0  | 10,250            | 7.6                                      | 28                                    | ---   | ---   | 30                                          | ---             | ---   | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 220   | 3.4  | 11,450            | 7.6                                      | 30                                    | ---   | ---   | 30                                          | ---             | ---   | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 230   | 3.7  | 12,550            | 7.6                                      | 30                                    | ---   | ---   | 30                                          | ---             | ---   | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 240   | 4.0  | 13,650            | 7.6                                      | 30                                    | ---   | ---   | 30                                          | ---             | ---   | ---                                   | ---                                         |
| 5 kW<br>4 lbs.                     | ECB29-5 (28K31)<br>Terminal Block<br>ECB29-5CB (28K32)<br>30A Circuit breaker                          | 1             | 208   | 3.8  | 12,800            | 7.6                                      | 32                                    | ---   | ---   | <sup>4</sup> 35                             | ---             | ---   | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 220   | 4.2  | 14,300            | 7.6                                      | 36                                    | ---   | ---   | <sup>4</sup> 40                             | ---             | ---   | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 230   | 4.6  | 15,700            | 7.6                                      | 36                                    | ---   | ---   | <sup>4</sup> 40                             | ---             | ---   | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 240   | 5.0  | 17,100            | 7.6                                      | 36                                    | ---   | ---   | <sup>4</sup> 40                             | ---             | ---   | ---                                   | ---                                         |
| 6 kW<br>4 lbs.                     | ECB29-6 (47L22)<br>Terminal Block<br>ECB29-6CB (47L23)<br>35A Circuit breaker                          | 1             | 208   | 4.5  | 15,400            | 7.6                                      | 37                                    | ---   | ---   | <sup>4</sup> 40                             | ---             | ---   | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 220   | 5.0  | 17,100            | 7.6                                      | 41                                    | ---   | ---   | <sup>4</sup> 45                             | ---             | ---   | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 230   | 5.5  | 18,800            | 7.6                                      | 41                                    | ---   | ---   | <sup>4</sup> 45                             | ---             | ---   | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 240   | 6.0  | 20,500            | 7.6                                      | 41                                    | ---   | ---   | <sup>4</sup> 45                             | ---             | ---   | ---                                   | ---                                         |
| 8 kW<br>5 lbs.                     | ECB29-8 (28K33)<br>Terminal Block<br>ECB29-8CB (28K34)<br>45A Circuit breaker                          | 1             | 208   | 6.0  | 20,500            | 7.6                                      | 46                                    | ---   | ---   | <sup>4</sup> 50                             | ---             | ---   | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 220   | 6.7  | 22,900            | 7.6                                      | 51                                    | ---   | ---   | <sup>4</sup> 60                             | ---             | ---   | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 230   | 7.3  | 25,100            | 7.6                                      | 51                                    | ---   | ---   | <sup>4</sup> 60                             | ---             | ---   | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 240   | 8.0  | 27,300            | 7.6                                      | 51                                    | ---   | ---   | <sup>4</sup> 60                             | ---             | ---   | ---                                   | ---                                         |
| 9 kW<br>5 lbs.                     | ECB29-9CB (10L11)<br>50A Circuit breaker<br>ECB29EH-9CB (91K67)<br>50A Circuit breaker                 | 2             | 208   | 6.8  | 25,600            | 7.6                                      | 50                                    | ---   | ---   | 50                                          | ---             | ---   | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 220   | 7.6  | 28,700            | 7.6                                      | 56                                    | ---   | ---   | <sup>4</sup> 60                             | ---             | ---   | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 230   | 8.3  | 31,400            | 7.6                                      | 56                                    | ---   | ---   | <sup>4</sup> 60                             | ---             | ---   | ---                                   | ---                                         |
|                                    |                                                                                                        |               | 240   | 9.0  | 34,100            | 7.6                                      | 56                                    | ---   | ---   | <sup>4</sup> 60                             | ---             | ---   | ---                                   | ---                                         |
| 12.5 kW<br>10 lbs.                 | ECB29-12.5CB (28K37)<br>ECB29EH-12.5CB (91K68)<br>(1) 25A Circuit breaker<br>& (1) 50A Circuit breaker | 2             | 208   | 9.4  | 32,000            | 7.6                                      | 28                                    | 38    | ---   | <sup>4</sup> 30                             | <sup>4</sup> 40 | ---   | 75                                    | 80                                          |
|                                    |                                                                                                        |               | 220   | 10.5 | 35,800            | 7.6                                      | 31                                    | 43    | ---   | <sup>4</sup> 35                             | <sup>4</sup> 45 | ---   | 75                                    | 80                                          |
|                                    |                                                                                                        |               | 230   | 11.5 | 39,200            | 7.6                                      | 31                                    | 43    | ---   | <sup>4</sup> 35                             | <sup>4</sup> 45 | ---   | 75                                    | 80                                          |
|                                    |                                                                                                        |               | 240   | 12.5 | 42,600            | 7.6                                      | 31                                    | 43    | ---   | <sup>4</sup> 35                             | <sup>4</sup> 45 | ---   | 75                                    | 80                                          |

| <b>ELECTRIC HEAT DATA - CB(X)27UH-048 (Continued)</b> |                                                                                                 |               |       |      |                   |                                          |                                       |       |       |                                             |                 |                 |                                       |                                             |
|-------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------|-------|------|-------------------|------------------------------------------|---------------------------------------|-------|-------|---------------------------------------------|-----------------|-----------------|---------------------------------------|---------------------------------------------|
| SINGLE PHASE                                          |                                                                                                 |               |       |      |                   |                                          |                                       |       |       |                                             |                 |                 |                                       |                                             |
| Model Number                                          |                                                                                                 | No. of Stages | Input |      |                   | <sup>2</sup> Blower Motor Full Load Amps | <sup>3</sup> Minimum Circuit Ampacity |       |       | <sup>5</sup> Maximum Overcurrent Protection |                 |                 | Single Point Power Source             |                                             |
|                                                       |                                                                                                 |               | Volts | kW   | <sup>1</sup> Btuh |                                          | Ckt 1                                 | Ckt 2 | Ckt 3 | Ckt 1                                       | Ckt 2           | Ckt 3           | <sup>3</sup> Minimum Circuit Ampacity | <sup>5</sup> Maximum Overcurrent Protection |
| 15 kW<br>12 lbs.                                      | ECB29-15CB (28K38)<br>ECB29EH-15CB (91K69)<br>(1) 30A Circuit breaker & (1) 60A Circuit breaker | 2             | 208   | 11.3 | 38,400            | 7.6                                      | 32                                    | 45    | ---   | <sup>4</sup> 35                             | <sup>4</sup> 45 | ---             | 88                                    | 90                                          |
|                                                       |                                                                                                 |               | 220   | 12.6 | 43,000            | 7.6                                      | 36                                    | 52    | ---   | <sup>4</sup> 40                             | 60              | ---             | 88                                    | 90                                          |
|                                                       |                                                                                                 |               | 230   | 13.5 | 47,000            | 7.6                                      | 36                                    | 52    | ---   | <sup>4</sup> 40                             | 60              | ---             | 88                                    | 90                                          |
|                                                       |                                                                                                 |               | 240   | 15.0 | 51,200            | 7.6                                      | 36                                    | 52    | ---   | <sup>4</sup> 40                             | 60              | ---             | 88                                    | 90                                          |
| 20 kW<br>19 lbs.                                      | ECB29-20CB (11L31)<br>ECB29EH-20CB (91K70)<br>(1) 50A Circuit breaker & (1) 60A Circuit breaker | 2             | 208   | 15.0 | 51,200            | 7.6                                      | 50                                    | 50    | ---   | 50                                          | <sup>4</sup> 50 | ---             | 114                                   | 125                                         |
|                                                       |                                                                                                 |               | 220   | 16.8 | 57,300            | 7.6                                      | 56                                    | 57    | ---   | <sup>4</sup> 60                             | 60              | ---             | 114                                   | 125                                         |
|                                                       |                                                                                                 |               | 230   | 18.4 | 62,700            | 7.6                                      | 56                                    | 57    | ---   | <sup>4</sup> 60                             | 60              | ---             | 114                                   | 125                                         |
|                                                       |                                                                                                 |               | 240   | 20.0 | 68,200            | 7.6                                      | 56                                    | 57    | ---   | <sup>4</sup> 60                             | 60              | ---             | 114                                   | 125                                         |
| 25 kW<br>19 lbs.                                      | ECB29-25CB (28K40)<br>(3) 50A Circuit breakers                                                  | 3             | 208   | 18.8 | 64,100            | 7.6                                      | 50                                    | 41    | 41    | 50                                          | <sup>4</sup> 45 | <sup>4</sup> 45 | 140                                   | 150                                         |
|                                                       |                                                                                                 |               | 220   | 21.0 | 71,700            | 7.6                                      | 53                                    | 43    | 43    | <sup>4</sup> 60                             | <sup>4</sup> 45 | <sup>4</sup> 45 | 140                                   | 150                                         |
|                                                       |                                                                                                 |               | 230   | 23.0 | 78,300            | 7.6                                      | 53                                    | 43    | 43    | <sup>4</sup> 60                             | <sup>4</sup> 45 | <sup>4</sup> 45 | 140                                   | 150                                         |
|                                                       |                                                                                                 |               | 240   | 25.0 | 85,300            | 7.6                                      | 53                                    | 43    | 43    | <sup>4</sup> 60                             | <sup>4</sup> 45 | <sup>4</sup> 45 | 140                                   | 150                                         |

NOTE - Circuit 1 Minimum Circuit Ampacity includes the Blower Motor Full Load Amps.

1 Electric heater capacity only - does not include additional blower motor heat capacity.

2 Amps shown are for blower motor only.

3 Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 167°F.

4 Bold text indicates that the circuit breaker on "CB" circuit breaker models must be replaced with size noted. See Table on Page <?>.

5 HACR type circuit breaker or fuse.

TABLE 7

| ELECTRIC HEAT DATA - CB(X)27UH-048 |                                                |               |        |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
|------------------------------------|------------------------------------------------|---------------|--------|------|-------------------|------------------------------------------|---------------------------------------|-------|---------------------------------------------|-----------------|---------------------------------------|---------------------------------------------|
| THREE PHASE                        |                                                |               |        |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
| Model Number                       |                                                | No. of Stages | Input  |      |                   | <sup>2</sup> Blower Motor Full Load Amps | <sup>3</sup> Minimum Circuit Ampacity |       | <sup>5</sup> Maximum Overcurrent Protection |                 | Single Point Power Source             |                                             |
|                                    |                                                |               | Volt s | kW   | <sup>1</sup> Btuh |                                          | Ckt 1                                 | Ckt 2 | Ckt 1                                       | Ckt 2           | <sup>3</sup> Minimum Circuit Ampacity | <sup>5</sup> Maximum Overcurrent Protection |
| 8 kW<br>5 lbs.                     | ECB29-8 (28K42)<br>Terminal block              | 1             | 208    | 6.0  | 20,500            | 7.6                                      | 30                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 220    | 6.7  | 22,900            | 7.6                                      | 33                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 230    | 7.3  | 25,100            | 7.6                                      | 33                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 240    | 8.0  | 27,300            | 7.6                                      | 33                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
| 10 kW<br>6 lbs.                    | ECB29-10 (28K43)<br>Terminal Block             | 1             | 208    | 7.5  | 25,600            | 7.6                                      | 36                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 220    | 8.4  | 28,700            | 7.6                                      | 40                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 230    | 9.2  | 31,400            | 7.6                                      | 40                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 240    | 10.0 | 34,100            | 7.6                                      | 40                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                    | ECB29-10 (28K47)<br>(3) 20A Fuses              | 1             | 440    | 8.4  | 28,700            | 4.0                                      | 18                                    | ---   | 20                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 460    | 9.2  | 31,400            | 4.0                                      | 19                                    | ---   | 20                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 480    | 10.0 | 34,100            | 4.0                                      | 20                                    | ---   | 25                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               |        |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
| 15 kW<br>12 lbs.                   | ECB29-15CB (28K44)<br>50A Circuit breaker      | 1             | 208    | 11.3 | 38,400            | 7.6                                      | 49                                    | ---   | 50                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 220    | 12.6 | 43,000            | 7.6                                      | 55                                    | ---   | <sup>4</sup> 60                             | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 230    | 13.5 | 47,000            | 7.6                                      | 55                                    | ---   | <sup>4</sup> 60                             | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 240    | 15.0 | 51,200            | 7.6                                      | 55                                    | ---   | <sup>4</sup> 60                             | ---             | ---                                   | ---                                         |
|                                    | ECB29-15 (28K48)<br>(3) 25A Fuses              | 1             | 440    | 12.6 | 43,000            | 4.0                                      | 25                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 460    | 13.5 | 47,000            | 4.0                                      | 26                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 480    | 15.0 | 51,200            | 4.0                                      | 27                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               |        |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
| 20 kW<br>19 lbs.                   | ECB29-20CB (28K45)<br>(2) 35A Circuit breaker  | 2             | 208    | 15.0 | 51,200            | 7.6                                      | 36                                    | 26    | <sup>4</sup> 40                             | <sup>4</sup> 30 | 70                                    | 70                                          |
|                                    |                                                |               | 220    | 16.8 | 57,300            | 7.6                                      | 40                                    | 30    | <sup>4</sup> 40                             | <sup>4</sup> 30 | 70                                    | 70                                          |
|                                    |                                                |               | 230    | 18.4 | 62,700            | 7.6                                      | 40                                    | 30    | <sup>4</sup> 40                             | <sup>4</sup> 30 | 70                                    | 70                                          |
|                                    |                                                |               | 240    | 20.0 | 68,200            | 7.6                                      | 40                                    | 30    | <sup>4</sup> 40                             | <sup>4</sup> 30 | 70                                    | 70                                          |
|                                    | ECB29-20 (28K49)<br>(3) 35A Fuses              | 1             | 440    | 16.8 | 57,300            | 4.0                                      | 33                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 460    | 18.4 | 62,700            | 4.0                                      | 34                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 480    | 20.0 | 68,200            | 4.0                                      | 35                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               |        |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
|                                    | <sup>6</sup> ECB29-20 (28K51)<br>(3) 25A Fuses | 1             | 550    | 16.8 | 57,300            | 4.0                                      | 27                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 575    | 18.4 | 62,700            | 4.0                                      | 28                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 600    | 20.0 | 68,200            | 4.0                                      | 29                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               |        |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
| 25 kW<br>19 lbs.                   | ECB29-25CB (28K46)<br>(2) 45A Circuit breaker  | 2             | 208    | 18.8 | 64,100            | 7.6                                      | 42                                    | 33    | <sup>4</sup> 50                             | <sup>4</sup> 35 | 85                                    | 90                                          |
|                                    |                                                |               | 220    | 21.0 | 71,700            | 7.6                                      | 47                                    | 38    | <sup>4</sup> 50                             | <sup>4</sup> 40 | 85                                    | 90                                          |
|                                    |                                                |               | 230    | 23.0 | 78,300            | 7.6                                      | 47                                    | 38    | <sup>4</sup> 50                             | <sup>4</sup> 40 | 85                                    | 90                                          |
|                                    |                                                |               | 240    | 25.0 | 85,300            | 7.6                                      | 47                                    | 38    | <sup>4</sup> 50                             | <sup>4</sup> 40 | 85                                    | 90                                          |
|                                    | ECB29-25 (28K50)<br>(3) 40A Fuses              | 1             | 440    | 21.0 | 71,700            | 4.0                                      | 39                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 460    | 23.0 | 78,300            | 4.0                                      | 41                                    | ---   | 45                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 480    | 25.0 | 85,300            | 4.0                                      | 42                                    | ---   | 45                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               |        |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
|                                    | <sup>6</sup> ECB29-25 (28K52)<br>(3) 35A Fuses | 1             | 550    | 21.0 | 71,700            | 4.0                                      | 32                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 575    | 23.0 | 78,300            | 4.0                                      | 34                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 600    | 25.0 | 85,300            | 4.0                                      | 35                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               |        |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |

NOTE - Circuit 1 Minimum Circuit Ampacity includes the Blower Motor Full Load Amps.

1 Electric heater capacity only - does not include additional blower motor heat capacity.

2 Amps shown are for blower motor only.

3 Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 167°F.

4 Bold text indicates that the circuit breaker on "CB" circuit breaker models must be replaced with size noted. See Table on Page <?>.

5 HACR type circuit breaker or fuse.

**TABLE 8**

| <b>ELECTRIC HEAT DATA - CB(X)27UH-060</b> |                                                                                                          |               |       |      |                   |                                          |                                       |       |       |                                             |                 |       |                                       |                                             |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------|-------|------|-------------------|------------------------------------------|---------------------------------------|-------|-------|---------------------------------------------|-----------------|-------|---------------------------------------|---------------------------------------------|
| SINGLE PHASE                              |                                                                                                          |               |       |      |                   |                                          |                                       |       |       |                                             |                 |       |                                       |                                             |
| Model Number                              |                                                                                                          | No. of Stages | Input |      |                   | <sup>2</sup> Blower Motor Full Load Amps | <sup>3</sup> Minimum Circuit Ampacity |       |       | <sup>5</sup> Maximum Overcurrent Protection |                 |       | Single Point Power Source             |                                             |
|                                           |                                                                                                          |               | Volts | kW   | <sup>1</sup> Btuh |                                          | Ckt 1                                 | Ckt 2 | Ckt 3 | Ckt 1                                       | Ckt 2           | Ckt 3 | <sup>3</sup> Minimum Circuit Ampacity | <sup>5</sup> Maximum Overcurrent Protection |
| 4 kW<br>4 lbs.                            | ECB29-4 (55W87)<br>Terminal Block<br>ECB29-4CB (55W88)<br>30A Circuit breaker                            | 1             | 208   | 3.0  | 10,250            | 7.6                                      | 28                                    | ---   | ---   | 30                                          | ---             | ---   | ---                                   | ---                                         |
|                                           |                                                                                                          |               | 220   | 3.4  | 11,450            | 7.6                                      | 30                                    | ---   | ---   | 30                                          | ---             | ---   | ---                                   | ---                                         |
|                                           |                                                                                                          |               | 230   | 3.7  | 12,550            | 7.6                                      | 30                                    | ---   | ---   | 30                                          | ---             | ---   | ---                                   | ---                                         |
|                                           |                                                                                                          |               | 240   | 4.0  | 13,650            | 7.6                                      | 30                                    | ---   | ---   | 30                                          | ---             | ---   | ---                                   | ---                                         |
| 5 kW<br>4 lbs.                            | ECB29-5 (28K31)<br>Terminal Block<br>ECB29-5CB (28K32)<br>30A Circuit breaker                            | 1             | 208   | 3.8  | 12,800            | 7.6                                      | 32                                    | ---   | ---   | <sup>4</sup> 35                             | ---             | ---   | ---                                   | ---                                         |
|                                           |                                                                                                          |               | 220   | 4.2  | 14,300            | 7.6                                      | 36                                    | ---   | ---   | <sup>4</sup> 40                             | ---             | ---   | ---                                   | ---                                         |
|                                           |                                                                                                          |               | 230   | 4.6  | 15,700            | 7.6                                      | 36                                    | ---   | ---   | <sup>4</sup> 40                             | ---             | ---   | ---                                   | ---                                         |
|                                           |                                                                                                          |               | 240   | 5.0  | 17,100            | 7.6                                      | 36                                    | ---   | ---   | <sup>4</sup> 40                             | ---             | ---   | ---                                   | ---                                         |
| 6 kW<br>4 lbs.                            | ECB29-6 (47L22)<br>Terminal Block<br>ECB29-6CB (47L23)<br>35A Circuit breaker                            | 1             | 208   | 4.5  | 15,400            | 7.6                                      | 37                                    | ---   | ---   | <sup>4</sup> 40                             | ---             | ---   | ---                                   | ---                                         |
|                                           |                                                                                                          |               | 220   | 5.0  | 17,100            | 7.6                                      | 41                                    | ---   | ---   | <sup>4</sup> 45                             | ---             | ---   | ---                                   | ---                                         |
|                                           |                                                                                                          |               | 230   | 5.5  | 18,800            | 7.6                                      | 41                                    | ---   | ---   | <sup>4</sup> 45                             | ---             | ---   | ---                                   | ---                                         |
|                                           |                                                                                                          |               | 240   | 6.0  | 20,500            | 7.6                                      | 41                                    | ---   | ---   | <sup>4</sup> 45                             | ---             | ---   | ---                                   | ---                                         |
| 8 kW<br>5 lbs.                            | ECB29-8 (28K33)<br>Terminal Block<br>ECB29-8CB (28K34)<br>45A Circuit breaker                            | 1             | 208   | 6.0  | 20,500            | 7.6                                      | 46                                    | ---   | ---   | <sup>4</sup> 50                             | ---             | ---   | ---                                   | ---                                         |
|                                           |                                                                                                          |               | 220   | 6.7  | 22,900            | 7.6                                      | 51                                    | ---   | ---   | <sup>4</sup> 60                             | ---             | ---   | ---                                   | ---                                         |
|                                           |                                                                                                          |               | 230   | 7.3  | 25,100            | 7.6                                      | 51                                    | ---   | ---   | <sup>4</sup> 60                             | ---             | ---   | ---                                   | ---                                         |
|                                           |                                                                                                          |               | 240   | 8.0  | 27,300            | 7.6                                      | 51                                    | ---   | ---   | <sup>4</sup> 60                             | ---             | ---   | ---                                   | ---                                         |
| 9 kW<br>5 lbs.                            | ECB29-9CB (10L11)<br>50A Circuit breaker<br>ECB29EH-9CB (91K67)<br>50A Circuit breaker                   | 2             | 208   | 6.8  | 25,600            | 7.6                                      | 50                                    | ---   | ---   | 50                                          | ---             | ---   | ---                                   | ---                                         |
|                                           |                                                                                                          |               | 220   | 7.6  | 28,700            | 7.6                                      | 56                                    | ---   | ---   | <sup>4</sup> 60                             | ---             | ---   | ---                                   | ---                                         |
|                                           |                                                                                                          |               | 230   | 8.3  | 31,400            | 7.6                                      | 56                                    | ---   | ---   | <sup>4</sup> 60                             | ---             | ---   | ---                                   | ---                                         |
|                                           |                                                                                                          |               | 240   | 9.0  | 34,100            | 7.6                                      | 56                                    | ---   | ---   | <sup>4</sup> 60                             | ---             | ---   | ---                                   | ---                                         |
| 12.5 kW<br>10 lbs.                        | ECB29-12.5CB (28K37)<br>ECB29EH-12.5CB (91K68)<br>(1) 25A Circuit Breaker<br>and (1) 50A Circuit breaker | 2             | 208   | 9.4  | 32,000            | 7.6                                      | 28                                    | 38    | ---   | <sup>4</sup> 30                             | <sup>4</sup> 40 | ---   | 75                                    | 80                                          |
|                                           |                                                                                                          |               | 220   | 10.5 | 35,800            | 7.6                                      | 31                                    | 43    | ---   | <sup>4</sup> 35                             | <sup>4</sup> 45 | ---   | 75                                    | 80                                          |
|                                           |                                                                                                          |               | 230   | 11.5 | 39,200            | 7.6                                      | 31                                    | 43    | ---   | <sup>4</sup> 35                             | <sup>4</sup> 45 | ---   | 75                                    | 80                                          |
|                                           |                                                                                                          |               | 240   | 12.5 | 42,600            | 7.6                                      | 31                                    | 43    | ---   | <sup>4</sup> 35                             | <sup>4</sup> 45 | ---   | 75                                    | 80                                          |



| ELECTRIC HEAT DATA - CB(X)27UH-060 (Continued) |                                                                                                      |               |       |      |                   |                                          |                                       |       |       |                                             |                 |                 |                                       |                                             |
|------------------------------------------------|------------------------------------------------------------------------------------------------------|---------------|-------|------|-------------------|------------------------------------------|---------------------------------------|-------|-------|---------------------------------------------|-----------------|-----------------|---------------------------------------|---------------------------------------------|
| SINGLE PHASE                                   |                                                                                                      |               |       |      |                   |                                          |                                       |       |       |                                             |                 |                 |                                       |                                             |
| Model Number                                   |                                                                                                      | No. of Stages | Input |      |                   | <sup>2</sup> Blower Motor Full Load Amps | <sup>3</sup> Minimum Circuit Ampacity |       |       | <sup>5</sup> Maximum Overcurrent Protection |                 |                 | Single Point Power Source             |                                             |
|                                                |                                                                                                      |               | Volts | kW   | <sup>1</sup> Btuh |                                          | Ckt 1                                 | Ckt 2 | Ckt 3 | Ckt 1                                       | Ckt 2           | Ckt 3           | <sup>3</sup> Minimum Circuit Ampacity | <sup>5</sup> Maximum Overcurrent Protection |
| 15 kW<br>12 lbs.                               | ECB29-15CB (28K38)<br>ECB29EH-15CB (91K69)<br>(1) 30A Circuit breaker<br>and (1) 60A Circuit breaker | 2             | 208   | 11.3 | 38,400            | 7.6                                      | 32                                    | 45    | ---   | <sup>4</sup> 35                             | <sup>4</sup> 45 | ---             | 88                                    | 90                                          |
|                                                |                                                                                                      |               | 220   | 12.6 | 43,000            | 7.6                                      | 36                                    | 52    | ---   | <sup>4</sup> 40                             | 60              | ---             | 88                                    | 90                                          |
|                                                |                                                                                                      |               | 230   | 13.5 | 47,000            | 7.6                                      | 36                                    | 52    | ---   | <sup>4</sup> 40                             | 60              | ---             | 88                                    | 90                                          |
|                                                |                                                                                                      |               | 240   | 15.0 | 51,200            | 7.6                                      | 36                                    | 52    | ---   | <sup>4</sup> 40                             | 60              | ---             | 88                                    | 90                                          |
| 20 kW<br>19 lbs.                               | ECB29-20CB (11L31)<br>ECB29EH-20CB (91K70)<br>(1) 50A Circuit Breaker<br>and (1) 60A Circuit breaker | 2             | 208   | 15.0 | 51,200            | 7.6                                      | 50                                    | 50    | ---   | 50                                          | <sup>4</sup> 50 | ---             | 114                                   | 125                                         |
|                                                |                                                                                                      |               | 220   | 16.8 | 57,300            | 7.6                                      | 56                                    | 57    | ---   | <sup>4</sup> 60                             | 60              | ---             | 114                                   | 125                                         |
|                                                |                                                                                                      |               | 230   | 18.4 | 62,700            | 7.6                                      | 56                                    | 57    | ---   | <sup>4</sup> 60                             | 60              | ---             | 114                                   | 125                                         |
|                                                |                                                                                                      |               | 240   | 20.0 | 68,200            | 7.6                                      | 56                                    | 57    | ---   | <sup>4</sup> 60                             | 60              | ---             | 114                                   | 125                                         |
| 25 kW<br>19 lbs.                               | ECB29-25CB (28K40)<br>(3) 50A Circuit breakers                                                       | 3             | 208   | 18.8 | 64,100            | 7.6                                      | 50                                    | 41    | 41    | 50                                          | <sup>4</sup> 45 | <sup>4</sup> 45 | 140                                   | 150                                         |
|                                                |                                                                                                      |               | 220   | 21.0 | 71,700            | 7.6                                      | 53                                    | 43    | 43    | <sup>4</sup> 60                             | <sup>4</sup> 45 | <sup>4</sup> 45 | 140                                   | 150                                         |
|                                                |                                                                                                      |               | 230   | 23.0 | 78,300            | 7.6                                      | 53                                    | 43    | 43    | <sup>4</sup> 60                             | <sup>4</sup> 45 | <sup>4</sup> 45 | 140                                   | 150                                         |
|                                                |                                                                                                      |               | 240   | 25.0 | 85,300            | 7.6                                      | 53                                    | 43    | 43    | <sup>4</sup> 60                             | <sup>4</sup> 45 | <sup>4</sup> 45 | 140                                   | 150                                         |

NOTE - Circuit 1 Minimum Circuit Ampacity includes the Blower Motor Full Load Amps.

1 Electric heater capacity only - does not include additional blower motor heat capacity.

2 Amps shown are for blower motor only.

3 Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 167°F.

4 Bold text indicates that the circuit breaker on "CB" circuit breaker models must be replaced with size noted. See Table on Page <?>.

5 HACR type circuit breaker or fuse.

TABLE 9

| ELECTRIC HEAT DATA - CB(X)27UH-060 |                                                |               |       |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
|------------------------------------|------------------------------------------------|---------------|-------|------|-------------------|------------------------------------------|---------------------------------------|-------|---------------------------------------------|-----------------|---------------------------------------|---------------------------------------------|
| THREE PHASE                        |                                                |               |       |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
| Model Number                       |                                                | No. of Stages | Input |      |                   | <sup>2</sup> Blower Motor Full Load Amps | <sup>3</sup> Minimum Circuit Ampacity |       | <sup>5</sup> Maximum Overcurrent Protection |                 | Single Point Power Source             |                                             |
|                                    |                                                |               | Volts | kW   | <sup>1</sup> Btuh |                                          | Ckt 1                                 | Ckt 2 | Ckt 1                                       | Ckt 2           | <sup>3</sup> Minimum Circuit Ampacity | <sup>5</sup> Maximum Overcurrent Protection |
| 8 kW<br>5 lbs.                     | ECB29-8 (28K42)<br>Terminal block              | 1             | 208   | 6.0  | 20,500            | 7.6                                      | 30                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 220   | 6.7  | 22,900            | 7.6                                      | 33                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 230   | 7.3  | 25,100            | 7.6                                      | 33                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 240   | 8.0  | 27,300            | 7.6                                      | 33                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
| 10 kW<br>6 lbs.                    | ECB29-10 (28K43)<br>Terminal Block             | 1             | 208   | 7.5  | 25,600            | 7.6                                      | 36                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 220   | 8.4  | 28,700            | 7.6                                      | 40                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 230   | 9.2  | 31,400            | 7.6                                      | 40                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 240   | 10.0 | 34,100            | 7.6                                      | 40                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                    | ECB29-10 (28K47)<br>(3) 20A Fuses              | 1             | 440   | 8.4  | 28,700            | 4.0                                      | 18                                    | ---   | 20                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 460   | 9.2  | 31,400            | 4.0                                      | 19                                    | ---   | 20                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 480   | 10.0 | 34,100            | 4.0                                      | 20                                    | ---   | 25                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               |       |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
| 15 kW<br>12 lbs.                   | ECB29-15CB (28K44)<br>50A Circuit breaker      | 1             | 208   | 11.3 | 38,400            | 7.6                                      | 49                                    | ---   | 50                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 220   | 12.6 | 43,000            | 7.6                                      | 55                                    | ---   | <sup>4</sup> 60                             | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 230   | 13.5 | 47,000            | 7.6                                      | 55                                    | ---   | <sup>4</sup> 60                             | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 240   | 15.0 | 51,200            | 7.6                                      | 55                                    | ---   | <sup>4</sup> 60                             | ---             | ---                                   | ---                                         |
|                                    | ECB29-15 (28K48)<br>(3) 25A Fuses              | 1             | 440   | 12.6 | 43,000            | 4.0                                      | 25                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 460   | 13.5 | 47,000            | 4.0                                      | 26                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 480   | 15.0 | 51,200            | 4.0                                      | 27                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               |       |      |                   |                                          |                                       |       |                                             |                 |                                       |                                             |
| 20 kW<br>19 lbs.                   | ECB29-20CB (28K45)<br>(2) 35A Circuit breaker  | 2             | 208   | 15.0 | 51,200            | 7.6                                      | 36                                    | 26    | <sup>4</sup> 40                             | <sup>4</sup> 30 | 70                                    | 70                                          |
|                                    |                                                |               | 220   | 16.8 | 57,300            | 7.6                                      | 40                                    | 30    | <sup>4</sup> 40                             | <sup>4</sup> 30 | 70                                    | 70                                          |
|                                    |                                                |               | 230   | 18.4 | 62,700            | 7.6                                      | 40                                    | 30    | <sup>4</sup> 40                             | <sup>4</sup> 30 | 70                                    | 70                                          |
|                                    |                                                |               | 240   | 20.0 | 68,200            | 7.6                                      | 40                                    | 30    | <sup>4</sup> 40                             | <sup>4</sup> 30 | 70                                    | 70                                          |
|                                    | ECB29-20 (28K49)<br>(3) 35A Fuses              | 1             | 440   | 16.8 | 57,300            | 4.0                                      | 33                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 460   | 18.4 | 62,700            | 4.0                                      | 34                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 480   | 20.0 | 68,200            | 4.0                                      | 35                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                    | <sup>6</sup> ECB29-20 (28K51)<br>(3) 25A Fuses | 1             | 550   | 16.8 | 57,300            | 4.0                                      | 27                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 575   | 18.4 | 62,700            | 4.0                                      | 28                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 600   | 20.0 | 68,200            | 4.0                                      | 29                                    | ---   | 30                                          | ---             | ---                                   | ---                                         |
| 25 kW<br>19 lbs.                   | ECB29-25CB (28K46)<br>(2) 45A Circuit breaker  | 2             | 208   | 18.8 | 64,100            | 7.6                                      | 42                                    | 33    | 45                                          | <sup>4</sup> 35 | 85                                    | 90                                          |
|                                    |                                                |               | 220   | 21.0 | 71,700            | 7.6                                      | 47                                    | 38    | <sup>4</sup> 50                             | <sup>4</sup> 40 | 85                                    | 90                                          |
|                                    |                                                |               | 230   | 23.0 | 78,300            | 7.6                                      | 47                                    | 38    | <sup>4</sup> 50                             | <sup>4</sup> 40 | 85                                    | 90                                          |
|                                    |                                                |               | 240   | 25.0 | 85,300            | 7.6                                      | 47                                    | 38    | <sup>4</sup> 50                             | <sup>4</sup> 40 | 85                                    | 90                                          |
|                                    | ECB29-25 (28K50)<br>(3) 40A Fuses              | 1             | 440   | 21.0 | 71,700            | 4.0                                      | 39                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 460   | 23.0 | 78,300            | 4.0                                      | 41                                    | ---   | 45                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 480   | 25.0 | 85,300            | 4.0                                      | 42                                    | ---   | 45                                          | ---             | ---                                   | ---                                         |
|                                    | <sup>6</sup> ECB29-25 (28K52)<br>(3) 35A Fuses | 1             | 550   | 21.0 | 71,700            | 4.0                                      | 32                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 575   | 23.0 | 78,300            | 4.0                                      | 34                                    | ---   | 35                                          | ---             | ---                                   | ---                                         |
|                                    |                                                |               | 600   | 25.0 | 85,300            | 4.0                                      | 35                                    | ---   | 40                                          | ---             | ---                                   | ---                                         |

NOTE - Circuit 1 Minimum Circuit Ampacity includes the Blower Motor Full Load Amps.

1 Electric heater capacity only - does not include additional blower motor heat capacity.

2 Amps shown are for blower motor only.

3 Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements. Use wires suitable for at least 167°F.

4 Bold text indicates that the circuit breaker on "CB" circuit breaker models must be replaced with size noted. See Table on Page <?>.

5 HACR type circuit breaker or fuse.

## IV-START-UP - OPERATION

### A-Preliminary and Seasonal Checks

- 1- Make sure the unit is installed in accordance with the installation instructions.
- 2- Inspect electrical wiring, both field and factory installed for loose connections. Tighten as required.
- 3- Check voltage at disconnect switch. Voltage must be within range listed on the nameplate. If not, consult the power company and have voltage condition corrected before starting unit.
- 4- Check to ensure that refrigerant lines are in good condition and pipe insulation is intact.
- 5- Inspect condition of condensate drain pan and piping assembly. Disassemble and clean seasonally.

### B-Cooling Start-Up

*NOTE-The following is a generalized procedure and does not apply to all thermostat control systems. Electronic thermostat control systems may operate differently.*

- 1- Set fan switch to AUTO or ON and move the system selection switch to COOL. Adjust the thermostat to a setting far enough below room temperature to bring on the compressor. Compressor will start and cycle on demand from the thermostat.
- 2- The refrigerant circuit is charged with HCFC-22 or HFC-410A refrigerant. See outdoor unit rating plate for correct charge amount.
- 3- Refer to the correct outdoor unit service manual for more information.

### C-Heating Start-Up

- 1- Set the fan switch to AUTO or ON and move the system selection switch to HEAT. Adjust the thermostat setting above room temperature.
- 2- The indoor blower immediately starts and the electric heat will stage on based on sequencer timing.

### D-Safety or Emergency Shutdown

Turn off unit power at circuit breaker.

### E-Extended Period Shutdown

Turn off thermostat or set to "UNOCCUPIED" mode. Turn off power to unit. All access panels and covers must be in place and secured. The condensate assembly should be clean and dry for extended period shutdown.

## V-TYPICAL OPERATING CHARACTERISTICS

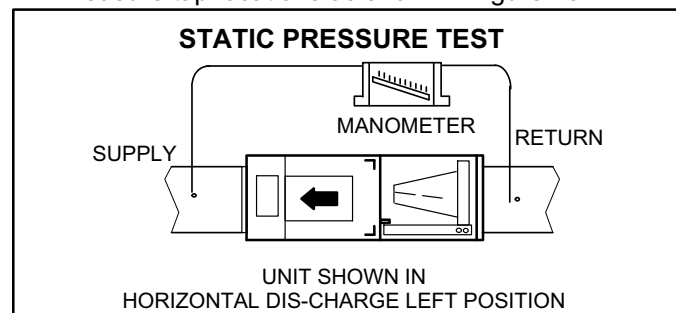
### A-Blower Operation and Adjustment

*NOTE- The following is a generalized procedure and does not apply to all thermostat controls.*

- 1- Blower operation is dependent on thermostat control system.
- 2- Generally, blower operation is set at thermostat sub-base fan switch. With fan switch in ON position, blower operates continuously. With fan switch in AUTO position, blower cycles with demand.
- 3- In all cases, blower and entire unit will be off when the system switch is in OFF position.

### B-External Static Pressure

- 1- Measure tap locations as shown in figure 10.



**FIGURE 10**

- 2- Punch a 1/4" (6mm) diameter hole in supply and return air plenums. Insert manometer hose flush with inside edge of hole or insulation. Seal around the hose with Permagum. Connect the zero end of the manometer to the discharge (supply) side of the system. On ducted systems, connect the other end of manometer to the return duct as above. For systems with non-ducted returns, leave the other end of the manometer open to the atmosphere.
- 3- With only the blower motor running and the evaporator coil dry, observe the manometer reading. Adjust blower motor speed to deliver the air desired according to the installation requirements.
- 4- External static pressure drop must not exceed 0.8" W.C.
- 5- Seal around the hole when the check is complete.

### C-Blower Speed Taps

#### Motor Speed Taps

*NOTE - Motor is programmed for a 45-second delay off on all speed taps except TAP #1 (continuous fan speed).*

**TABLE 10**

| Tap | Operation                                                                | Remarks                                                                                                                                                                                                            |
|-----|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | <b>Continuous or low speed fan</b> (for 2-speed heat pumps or A/C units) | Continuous fan speed is energized (24 volt input to "G") when either "G" or "Y1" has a 24 volt signal (24 volt input from "Y1" passes through the room thermostat's "Fan Automatic contacts" to the "G" terminal). |
| 2   | <b>Low-speed operation on high static system</b>                         | CFM set at 1/2 ton less than nominal of unit (e.g. 3-ton set at 1000 CFM).                                                                                                                                         |
| 3   | <b>Cooling speed setting</b>                                             | CFM set at 400 cfm per nominal ton at ARI minimum static allowed, as follows:<br>1.5 to 2.0 ton - 0.10<br>2.5 to 3.5 ton - 0.15<br>4 to 5 ton - 0.20.                                                              |
| 4   | <b>Heat pump with electric heat</b>                                      | CFM set at 400 cfm per nominal ton at .4 static. Energized when electric heat element has a call for heat.                                                                                                         |
| 5   | <b>High static applications</b>                                          | CFM set at 400 cfm per nominal ton at .8 static.                                                                                                                                                                   |

Table 11 shows the recommended factory blower speed tap selections for CB27UH/CBX27UH series units.

These settings are for nominal tonnage match-ups with the CB27UH/CBX27UH units. When matched with other sizes, it is recommended that the CFM be adjusted to approximately 400 CFM per ton.

To change blower motor speed tap remove the speed tap from Y2 on the terminal strip and insert the desired speed tap. See blower data on Page 4 for the desired CFM setting

**TABLE 11**

| Recommended Blower Speed Tap Selection |               |                                         |     |
|----------------------------------------|---------------|-----------------------------------------|-----|
| Operation                              | CB(X)27UH     | Outdoor unit                            | Tap |
| Cooling                                | ALL<br>MODELS | Condensing unit                         | 3   |
|                                        |               | Heat pump                               | 3   |
| Heating*                               |               | Condensing unit with electric heat only | 4   |
|                                        |               | Heat pump with electric heat            | 4   |

\* Minimum setting for heat

**NOTE** - Motor is programmed for a 45-second delay off on all speed taps except TAP #1 (continuous fan speed).

## VI-MAINTENANCE

### **⚠ WARNING**

**Disconnect power before performing any maintenance.**

At the beginning of each heating/cooling season, the system should be checked as follows:

### A-Filters

#### **⚠ IMPORTANT**

**Filter access panel must be in place during unit operation. Excessive warm air entering the unit may result in water blow-off problems.**

Filters may be duct-mounted or installed in the cabinet. A filter is installed at the factory. Note that filter access door fits over access panel. Air will leak if the access panel is placed over the filter door.

Filters should be inspected monthly and must be cleaned or replaced when dirty to assure proper air handler operation. Units are equipped with standard throw-away type filters which should be replaced when dirty.

To remove filter, loosen the thumbscrews holding the filter panel in place. Slide filter out of the guides on either side of cabinet, insert new filter and replace panel.

**TABLE 12**

| CB27UH/CBX27UH Model   | Filter Size - In. (mm) |
|------------------------|------------------------|
| -018, -024, -030, -036 | 20 x 20 (508 x 508)    |
| -042, -048, -060       | 20 x 24 (508 x 610)    |

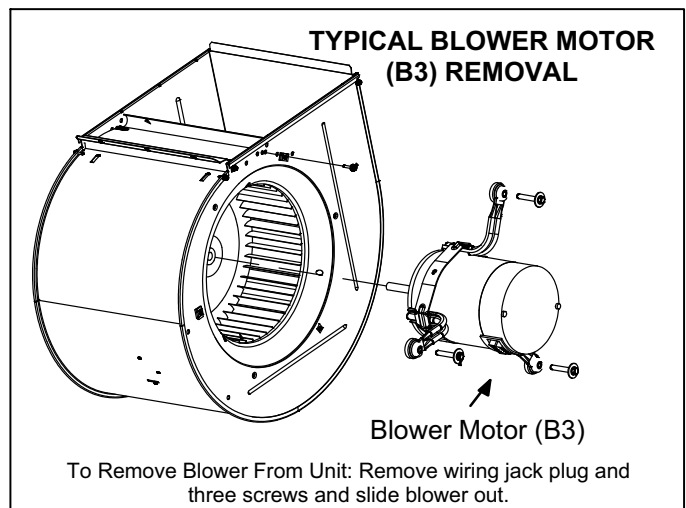
### B-Supply Air Blower

- 1- Check and clean blower wheel.
- 2- Motors are pre-lubricated for extended life; no further lubrication is required.

### C-Electrical

- 1- Check all wiring for loose connections.
- 2- Check circuit breaker located in unit control box.
- 3- Check for correct voltage at unit (unit operating).
- 4- Check amp-draw on blower motor.
- 5- Check to see that heat (if applicable) is operating.

### D-CONSTANT TORQUE SPEED BLOWER MOTOR (ECM) (B3)



**FIGURE 11**

## ⚠ WARNING

During blower operation, the ECM motor emits energy that may interfere with pacemaker operation. Interference is reduced by both the sheet metal cabinet and distance.

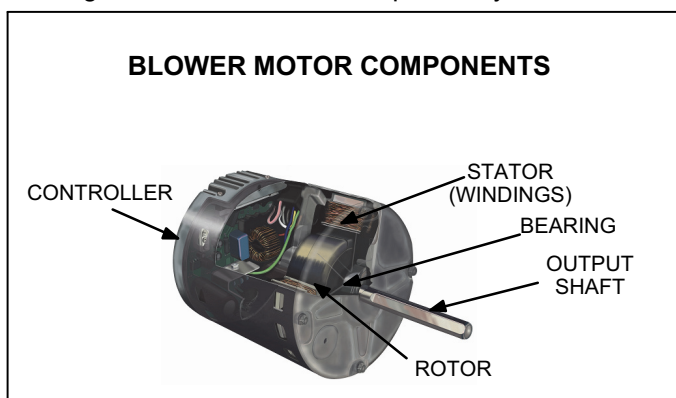
The constant torque ECM (electronically commutated motor) communicates with the air handler control via 24VAC inputs. It is programmed to provide a constant level of torque (current /power) to the motor. This is a multi-top motor with the ability to have 1 to 5 programed levels of torque (see table 13). Each value equals a specific amount of torque to create the proper amount of airflow for each system demand. This value is specific to model and size system.

**TABLE 13**

| TAPE SETTINGS        |       |       |       |       |       |
|----------------------|-------|-------|-------|-------|-------|
| Parameter            | Tap 1 | Tap 2 | Tap 3 | Tap 4 | Tap 5 |
| OFF-Delay            | 0     | 45    | 45    | 45    | 45    |
| Torque (oz. ft) (Se) | 25.73 | 37.96 | 47.38 | 50.51 | 57.73 |
| % of full output     | 32.16 | 47.45 | 59.22 | 63.14 | 72.16 |

Each a tap can have a unique amount of torque programmed for a specific purpose. For example switching from Tap 1 to tap 2 may increase the airflow but not necessarily at a specific interval like changing from low to medium low speed on a PSC motor.

Internal components are shown in figure 12. The stator windings are split into three poles which are electrically connected to the controller. This arrangement allows motor windings to turn on and off in sequence by the controller.



**FIGURE 12.**

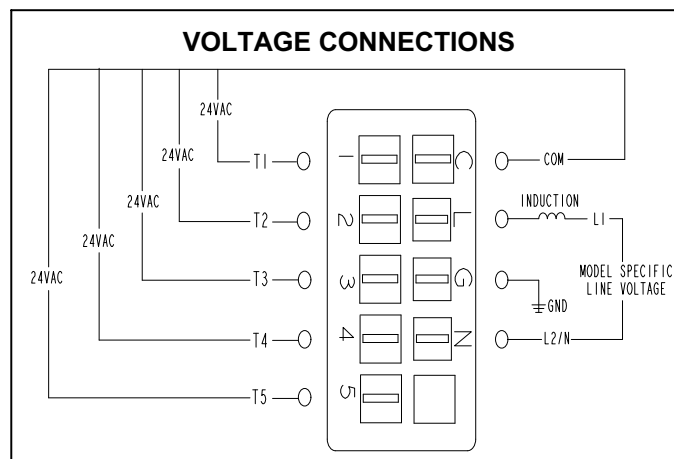
The controller uses sensing devices to sense what position the rotor is in at any given time. By sensing the position of the rotor and then switching the motor windings on and off in sequence, the rotor shaft turns the blower.

### Operation

The 230VAC voltage connections to the motor are labeled **L**, **G** and **N**.

- 230VAC **L** = L1 115VAC, **G** = Ground, **N** = L2 115VAC

The 230VAC is connected to the motor at all times. This voltage operates the internal electronics and drives the motor. In addition, the motor requires a low voltage to operate. The low voltage to the motor is delivered to taps 1-5 and the (C) terminal from the control relay. The motor accepts a communication signal of 24VAC on these taps. Instead of energizing a motor speed (winding) on a PSC motor for each demand (heat cool, constant fan); the communication voltage directs the motor to operate at the torque value stored for each tap.



**FIGURE 13.**

During each demand, the fan motor will maintain the selected torque during changes in the systems external static pressure (ESP) (constant torque). If ESP increases the motor will use more power (current) to maintain torque. The motor has a programmed limit of operation to protect itself from damage, due to the energy it must use to maintain torque at high external static pressures. If the systems maximum total ESP is exceeded, torque will not be maintained, however the motor will deliver as much torque as possible, without causing damage to itself.

Constant torque allows the fan motor to maintain the torque (current) delivered to the motor when ESP is higher than recommended and/or changes during system operation. ESP (the resistance to the movement of air) is increased when duct work is undersized, poorly constructed and/or full or dirt or debris. ESP can increase during system operation when dirt builds up on the air distribution systems components, especially the filter, and when customers close or block grilles and registers. When torque is maintained, airflow does not decrease as fast as it would on a PSC motor system. This decreases the effect ESP has on loss of airflow, providing better system performance and efficiency within the limits of the motor design.

The fan motor has no programmable (On) delays but multiple (Off) delays (see table 13) are programmed into the motor. The off delay is programmed into the motor and can not be adjusted.

### Installation

It is recommended that the electrical connections on the ECM be facing down or between the 4 and 8 O'clock position, and a drip loop formed out of the wiring harness leaving the motor. This is to prevent any moisture or water that may get into the motor area from running into the connect-

ors where it could cause damage to the control. In most systems.

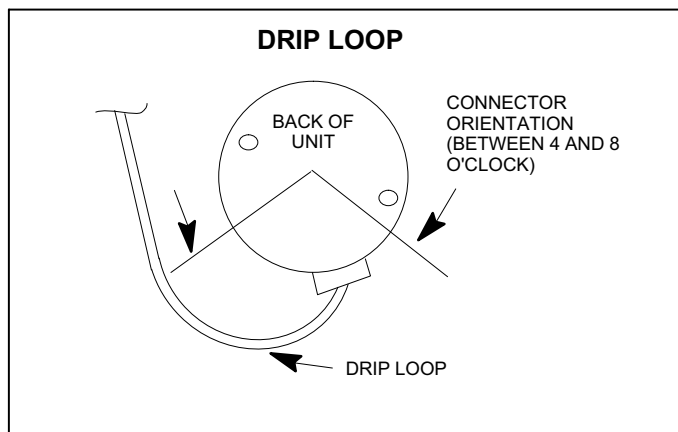


FIGURE 14



#### INDOOR BLOWER MOTOR (B3) CONTROL TROUBLESHOOTING (REGAL-BELOIT)

Before troubleshooting any HVAC system, it is a good practice to become familiar with the components and wiring diagram. On fan motor systems it is a good practice to check the tap selections and delay settings.

*If the motor is running* but the system is noisy, shutting down on its limits or safeties or the evaporator coil is freezing, there is a good chance the motor is good. The problem is most likely external to the motor.

- Check the tap selections using the HVAC OEM guide
- Check the air distribution system components for dirt load and closed dampers, registers and grilles.
- Measure the total external static pressure. Make repair(s) if above the recommended maximum level and confirm airflow at the new total ESP with the air flow tables (see table x). Aftermarket filter sizing is a common issue.

*If the motor is not running*, the following checks will diagnose whether it is operational. **Always disconnect the power to the HVAC system before disconnecting or reconnecting any connectors to these motors.** There are two inputs needed to operate this motor, a high voltage constant power source, and the low voltage communication that selects the torque value in each tap per demand.

#### Checking 230VAC Voltage Input

First check the high voltage to terminals (L) and (N). There should be 230VAC on these two terminals whenever there is power to the system, regardless of a demand call. Applying incorrect high voltage to the motor may cause the motor to not operate, or even damage the motor.

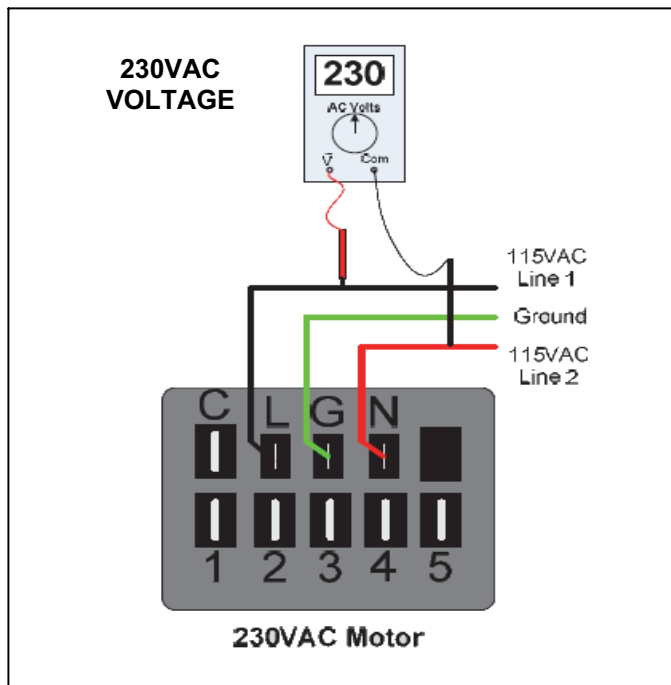


FIGURE 15

#### Checking the Low-Voltage Communication Input

If no low voltage communication (typically 24vac) is measured at the motor on taps 1-5, check the HVAC system wiring, controls and demand call. Always check low voltage between terminals 1-5 and (C) at the motor, never ground. Once the problem is corrected, confirm that the low voltage communication is applied to a programmed tap. If proper low voltage communication is present at a programmed tap, with proper high voltage to the motor and it still does not operate, the motor is failed.

- 1- Initiate a demand from the thermostat and check the voltage between the common and the appropriate motor terminal 1- 5. Confirm the meter is set to the 24VAC.
- 2- If the low voltage communication is not present, check the demand from the thermostat. Also check the output terminal and wires from the K20 blower relay.
- 3- If the motor has proper high voltage as identified in the previous section, and proper low voltage to a programmed terminal, and motor is not operating, the motor has failed. Replace motor.

## VII-WIRING DIAGRAMS AND SEQUENCE OF OPERATIONS

### A- CB(X)27UH Units 208/230V/460V SINGLE PHASE - SEQUENCE OF OPERATION

- 1- Line voltage is routed to transformer T1 and blower motor B3.
- 2- T1 supplies 24VAC to terminal strip TB1, which supplies 24VAC to the indoor thermostat and electric heat, if used.

#### **HEATING**

- 3- When there is a call for heat, W1 of the thermostat energizes the electric heat relay K32 (covered in the electric heat section).
- 4- Blower motor B3 is energized on heating speed after K20-1 closes.
- 5- Economizer (if used) is energized.

#### ***SINGLE-STAGE COOLING (Y1 to Y2 jumper in place)***

- 6- When there is a call for cooling, Y2 of the thermostat energizes blower on cooling speed.

#### ***TWO-STAGE THERMOSTAT***

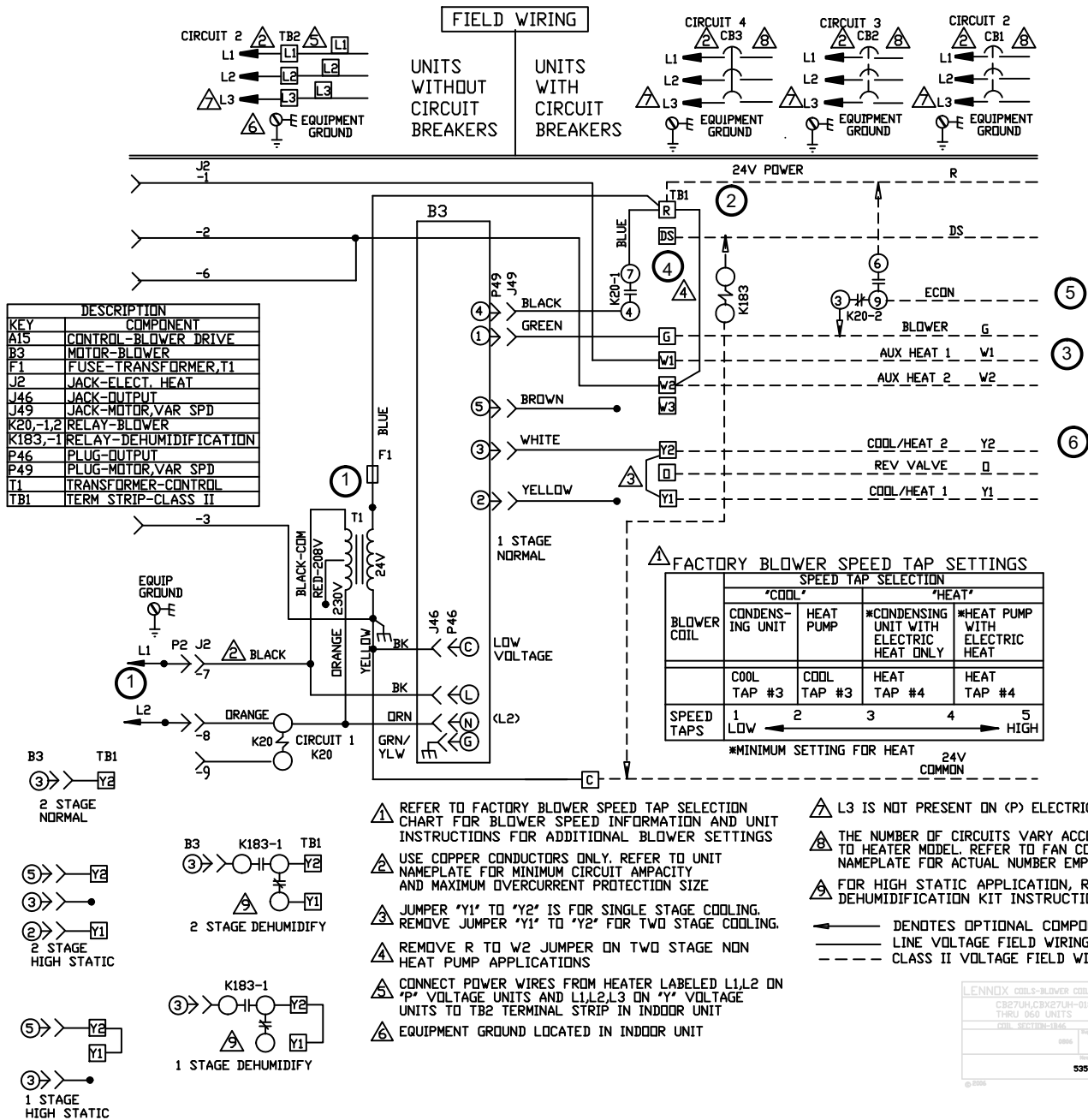
***(remove jumper between Y1 and Y2)***

#### ***FIRST-STAGE COOLING***

- 7- When there is a call for cooling, Y1 sends power through the room thermostat to G to energizes blower on first stage cooling speed.

#### ***SECOND-STAGE COOLING***

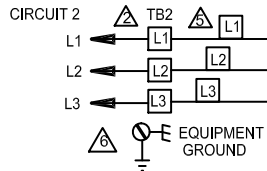
- 8- When there is a call for second stage cooling, Y2 of the thermostat energizes blower on cooling speed.



## 208/230V - Single Phase

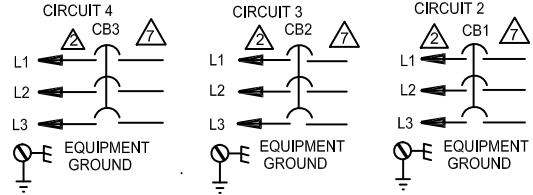


## FIELD WIRING FOR UNITS WITHOUT CIRCUIT BREAKERS

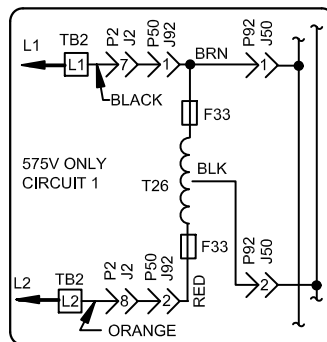
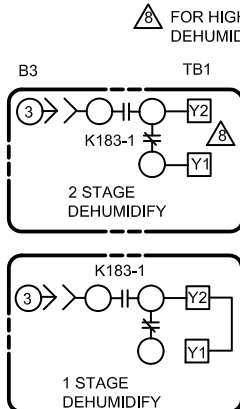
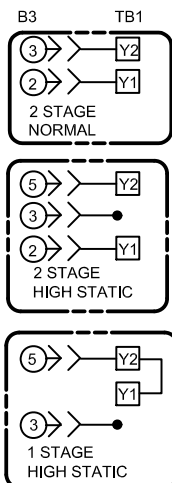
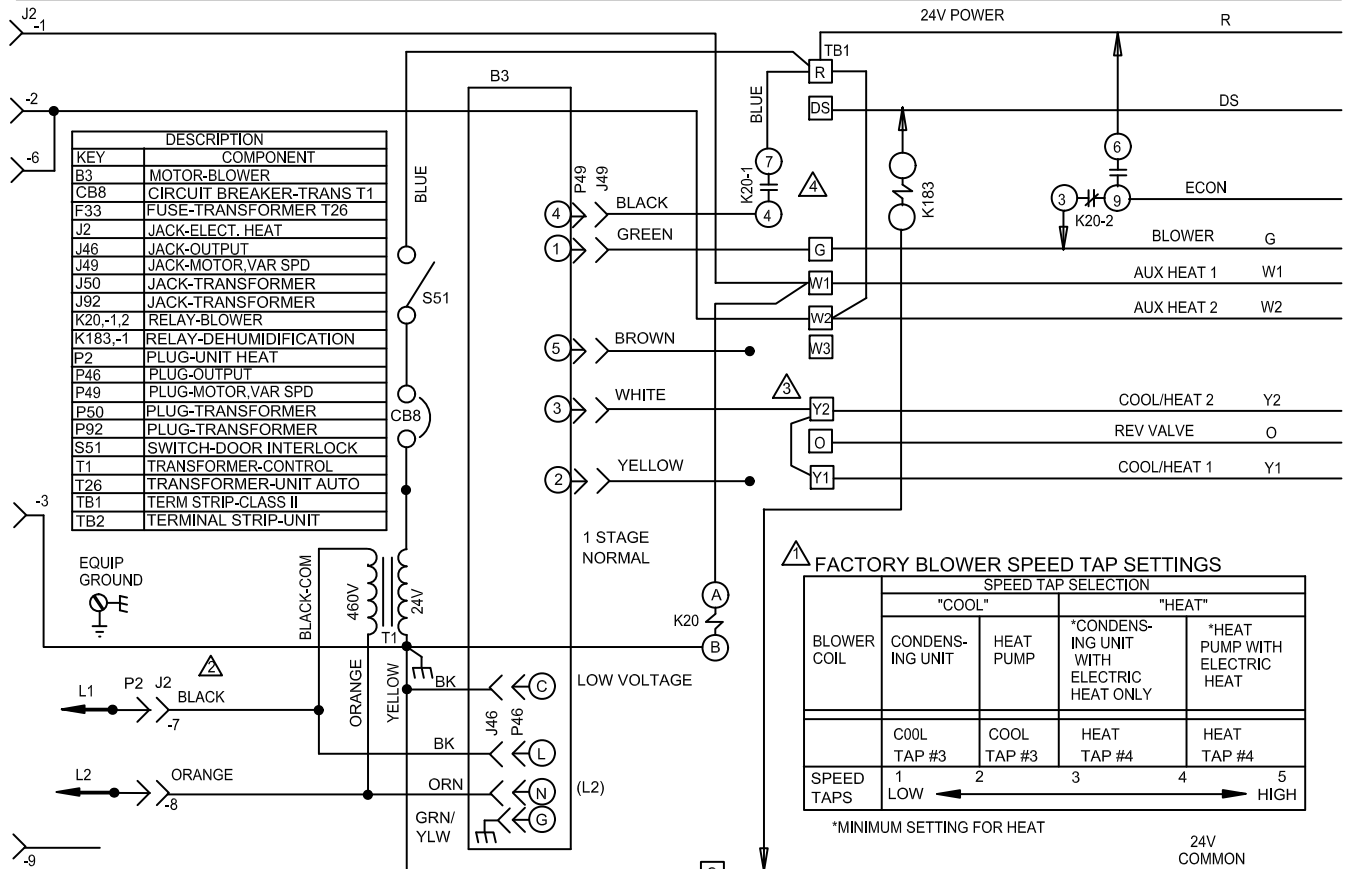


- △ CONNECT POWER WIRES FROM HEATER LABELED L1, L2, L3 ON G VOLTAGE UNITS TO TB2 TERMINAL STRIP IN INDOOR UNIT
- △ EQUIPMENT GROUND LOCATED IN INDOOR UNIT

## FIELD WIRING FOR UNITS WITH CIRCUIT BREAKERS



- △ THE NUMBER OF CIRCUITS VARY ACCORDING TO HEATER MODEL. REFER TO FAN COIL NAMEPLATE FOR ACTUAL NUMBER EMPLOYED



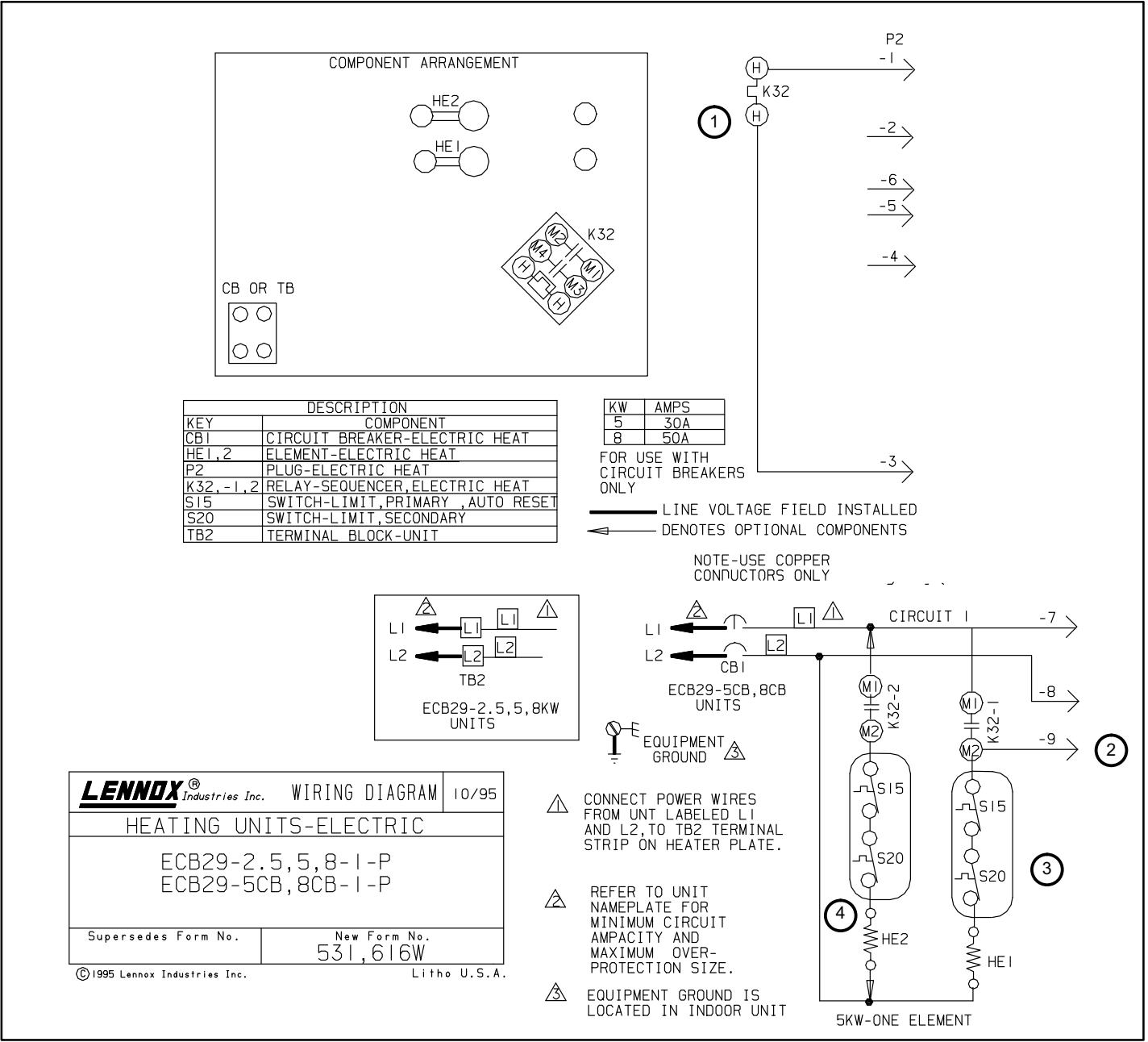
- DENOTES OPTIONAL COMPONENTS
- LINE VOLTAGE FIELD WIRING
- CLASS II VOLTAGE FIELD WIRING

- △ REFER TO FACTORY BLOWER SPEED TAP SELECTION CHART FOR BLOWER SPEED INFORMATION AND UNIT INSTRUCTIONS FOR ADDITIONAL BLOWER SETTINGS
- △ USE COPPER CONDUCTORS ONLY. REFER TO UNIT NAMEPLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE
- △ JUMPER "Y1" TO "Y2" IS FOR SINGLE STAGE COOLING. REMOVE JUMPER "Y1" TO "Y2" FOR TWO STAGE COOLING.
- △ REMOVE R TO W2 JUMPER ON TWO STAGE NON HEAT PUMP APPLICATIONS

## 460V - Single Phase

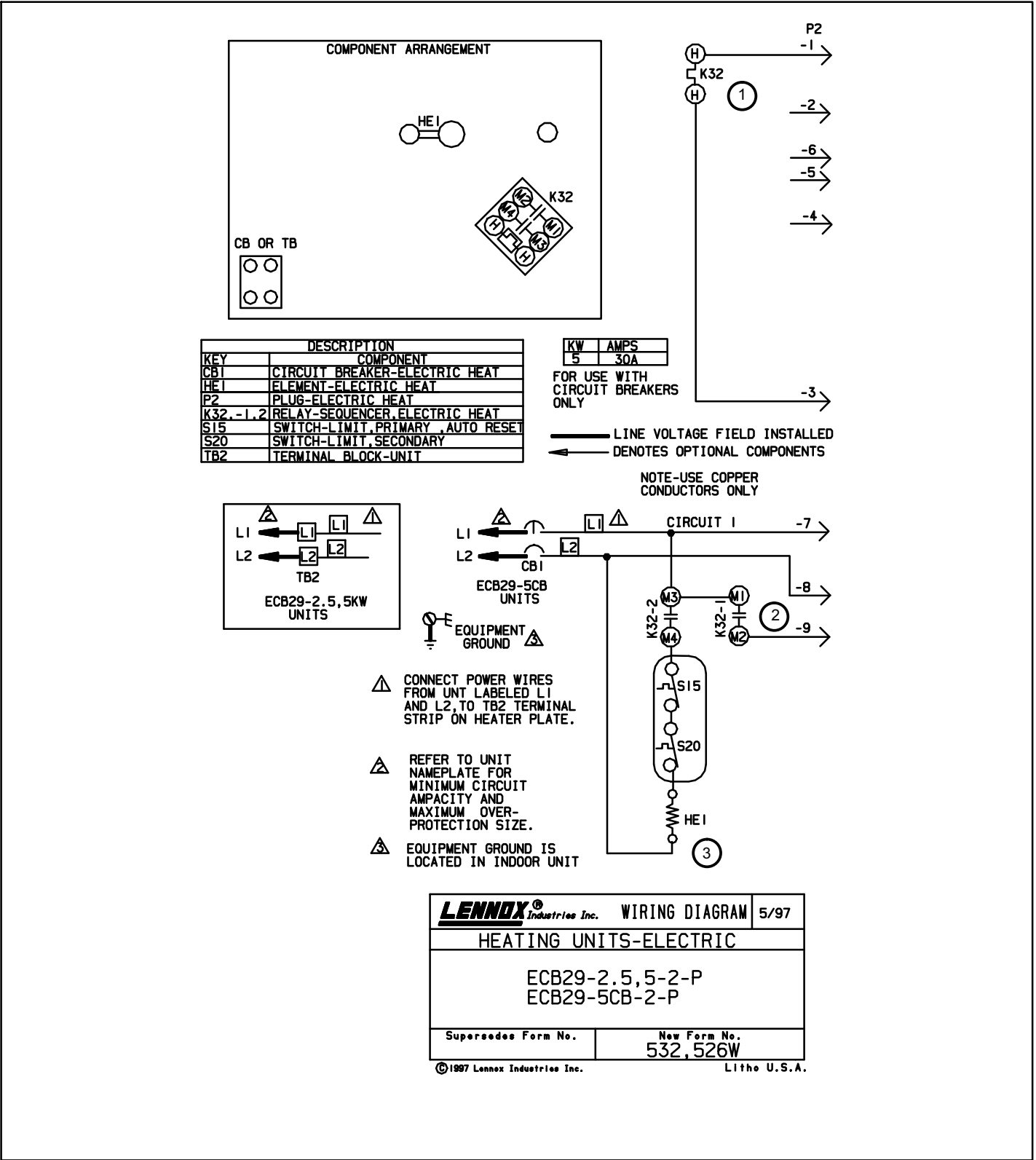
B-ECB29-2.5, -5, -5CB, -8, -8CB - 208/230V SINGLE PHASE - SEQUENCE OF OPERATION

- 1- When there is a call for heat, W1 of the thermostat energizes the electric heat relay K32 with 24VAC.
- 2- When K32-1 closes, the blower is energized on heating speed and economizer heat relay K43 is energized (see 208/230VAC CB schematic).
- 3- Assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat element HE1 is energized.
- 4- When K32-2 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat element HE2 is energized.



C-ECB29-2.5, -5, -5CB, 6, 6CB 208/230V SINGLE PHASE - SEQUENCE OF OPERATION

- 1- When there is a call for heat, W1 of the thermostat energizes the electric heat relay K32 with 24VAC.
- 2- When K32-1 closes, the blower is energized on heating speed and economizer heat relay K43 is energized (see 208/230VAC CB schematic).
- 3- When K32-2 closes, assuming N.C. primary (S15) and the secondary (S20) limit switches are closed, electric heat element HE1 is energized.



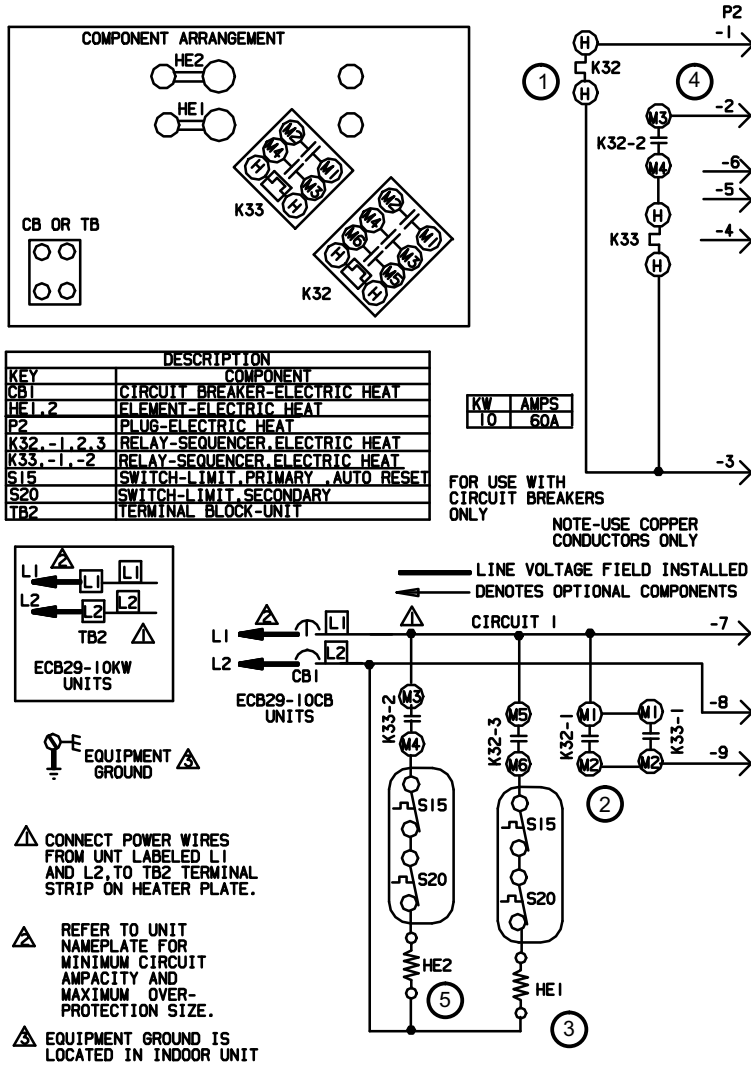
D-ECB29-10, -10CB - 208/230V SINGLE PHASE - SEQUENCE OF OPERATION

FIRST STAGE HEAT

- 1- When there is a call for heat, W1 of the thermostat energizes the electric heat relay K32 with 24VAC.
- 2- When K32-1 closes, the blower is energized on heating speed and economizer heat relay K43 is energized (see 208/230VAC CB schematic).
- 3- K32-3 closes and assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat element HE1 is energized.

SECOND STAGE HEAT  
(remove jumper between W2 and R)

- 4- When K32-2 closes, the unit is ready for a second stage heat demand. W2 of the thermostat sends a second stage heat demand, energizing the electric heat relay K33 with 24VAC.
- 5- When K33-2 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat element HE2 is energized. K33-1 closes until second stage heat demand is satisfied.



|                                                   |                          |
|---------------------------------------------------|--------------------------|
| <b>LENNOX</b> Industries Inc. WIRING DIAGRAM 5/97 |                          |
| HEATING UNITS-ELECTRIC                            |                          |
| ECB29-10-2-P<br>ECB29-10CB-2-P                    |                          |
| Supersedes Form No.                               | New Form No.<br>532,527W |
| ©1997 Lennox Industries Inc. Litho U.S.A.         |                          |

# E-ECB29-12.5CB, -15CB - 208/230V SINGLE PHASE - SEQUENCE OF OPERATION

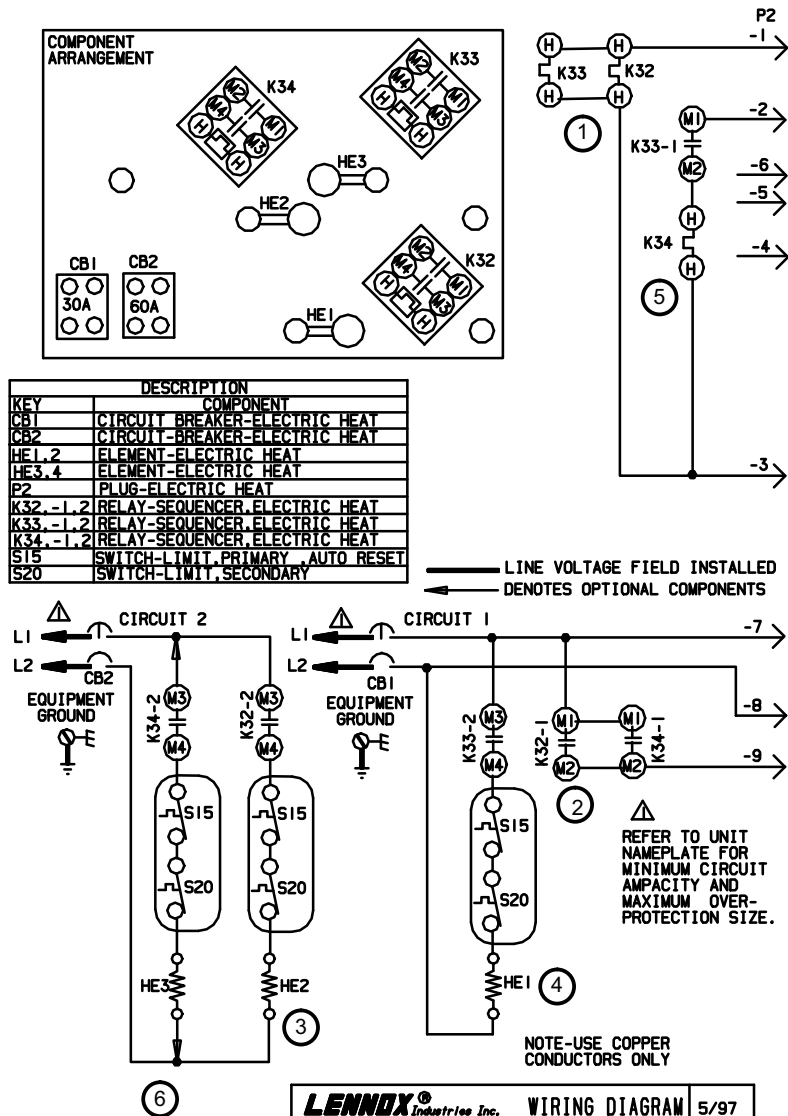
## FIRST STAGE HEAT

- 1- When there is a call for heat, W1 of the thermostat energizes electric heat relays K32 and K33 with 24VAC.
- 2- When K32-1 closes, the blower is energized on heating speed and economizer heat relay K43 is energized (see 208/230VAC CB schematic).
- 3- When K32-2 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat element HE2 is energized.

## SECOND STAGE HEAT

(remove jumper between W2 and R)

- 4- When K33-1 closes, the unit is ready for a second stage heat demand. When K33-2 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat element HE1 is energized.
- 5- W2 of the thermostat sends a second stage heat demand, energizing electric heat relay K34 with 24VAC.
- 6- When K34-1 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, heating element HE3 is energized. K34-1 closes until second stage demand is satisfied.



|                                                 |  |                |      |
|-------------------------------------------------|--|----------------|------|
| <b>LENNOX</b><br><small>Industries Inc.</small> |  | WIRING DIAGRAM | 5/97 |
| HEATING UNITS-ELECTRIC                          |  |                |      |
| ECB29-12.5CB, 15CB-2-P                          |  |                |      |
| Supersedes Form No.                             |  | New Form No.   |      |
|                                                 |  | 532,524W       |      |
| ©1997 Lennox Industries Inc.                    |  | Little U.S.A.  |      |

# F-ECB29-9CB, 20CB - 208/230V SINGLE PHASE - SEQUENCE OF OPERATION

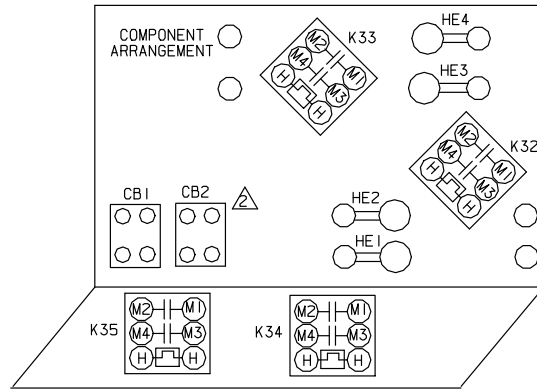
## FIRST STAGE HEAT

- 1- When there is a call for heat, W1 of the thermostat energizes the electric heat relays.  
9kW - K32 is energized with 24VAC.  
20kW - K32 and K33 with 24VAC.
- 2- 9kW, 20kW - When K32-1 closes, the blower is energized on heating speed and economizer heat relay K43 is energized (see 208/230VAC CB schematic).
- 3- 9kW, 20kW - When K32-2 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat element HE1 is energized.
- 4- 20kW - When K33-2 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat element HE2 is energized.

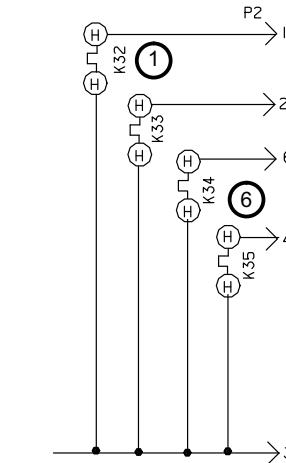
## SECOND STAGE HEAT

(remove jumper between W2 and R)

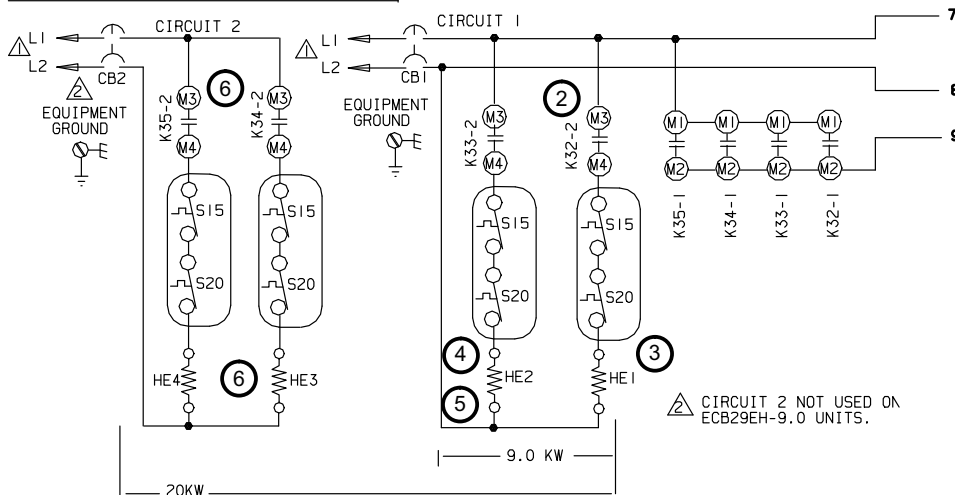
- 5- 9kW - W2 of the thermostat sends a second stage heat demand, energizing the electric heat relays K33 with 24VAC. When K33-2 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat element HE2 is energized.
- 6- 20kW - W2 of the thermostat sends a second stage heat demand, energizing the electric heat relays K34 and K35 with 24VAC. When K34-2 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, heating element HE3 is energized. When K35-2 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat element HE4 is energized.



| KEY      | DESCRIPTION                     |
|----------|---------------------------------|
| CB1      | CIRCUIT BREAKER-ELECTRIC HEAT   |
| CB2      | CIRCUIT-BREAKER-ELECTRIC HEAT   |
| HE1,2    | ELEMENT-ELECTRIC HEAT           |
| HE3,4    | ELEMENT-ELECTRIC HEAT           |
| K32,-1,2 | RELAY-SEQUENCER,ELECTRIC HEAT   |
| K33,-1,2 | RELAY-SEQUENCER,ELECTRIC HEAT   |
| K34,-1,2 | RELAY-SEQUENCER,ELECTRIC HEAT   |
| K35,-1,2 | RELAY-SEQUENCER,ELECTRIC HEAT   |
| P2       | PLUG-ELECTRIC HEAT              |
| S15      | SWITCH-LIMIT,PRIMARY,AUTO RESET |
| S20      | SWITCH-LIMIT,SECONDARY          |



NOTE-USE COPPER CONDUCTORS ONLY  
— LINE VOLTAGE FIELD INSTALLED  
◀ DENOTES OPTIONAL COMPONENTS



# G-ECB29-25CB, -30CB - 208/230V SINGLE PHASE - SEQUENCE OF OPERATION

## FIRST STAGE HEAT

- 1- When there is a call for heat, W1 of the thermostat energizes the electric heat relays K32 and K34 with 24VAC.
- 2- When K32-1 closes, the blower is energized on heating speed and economizer heat relay K43 is energized (see 208/230VAC CB schematic).
- 3- When K32-2 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat element HE1 is energized.
- 4- When K34-2 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat element HE2 is energized.

## SECOND STAGE HEAT

(remove jumper between W2 and R)

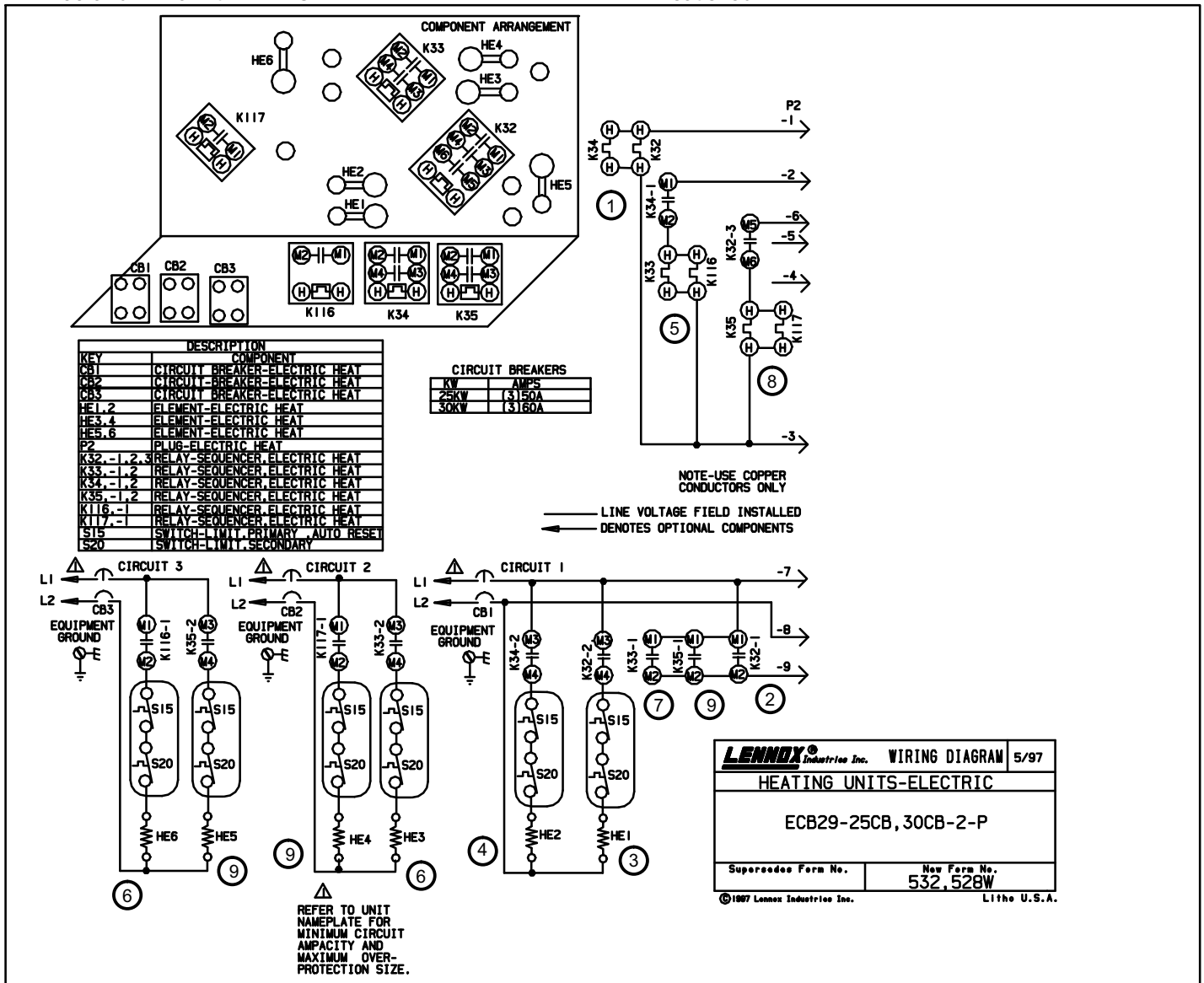
- 5- When K34-1 closes, the unit is ready for a second stage heat demand. W2 of the thermostat sends a second stage heat demand, energizing the electric heat relays K33 and K116 with 24VAC.

- 6- When K33-2 and K16-1 close, assuming primary (S15) and secondary (S20) limit switches are closed, electric heat elements HE3 and HE6 are energized.
- 7- K33-1 closes and remains closed until second stage heat demand is satisfied.

## THIRD STAGE HEAT

(remove jumper between W3 and R, if using third stage)

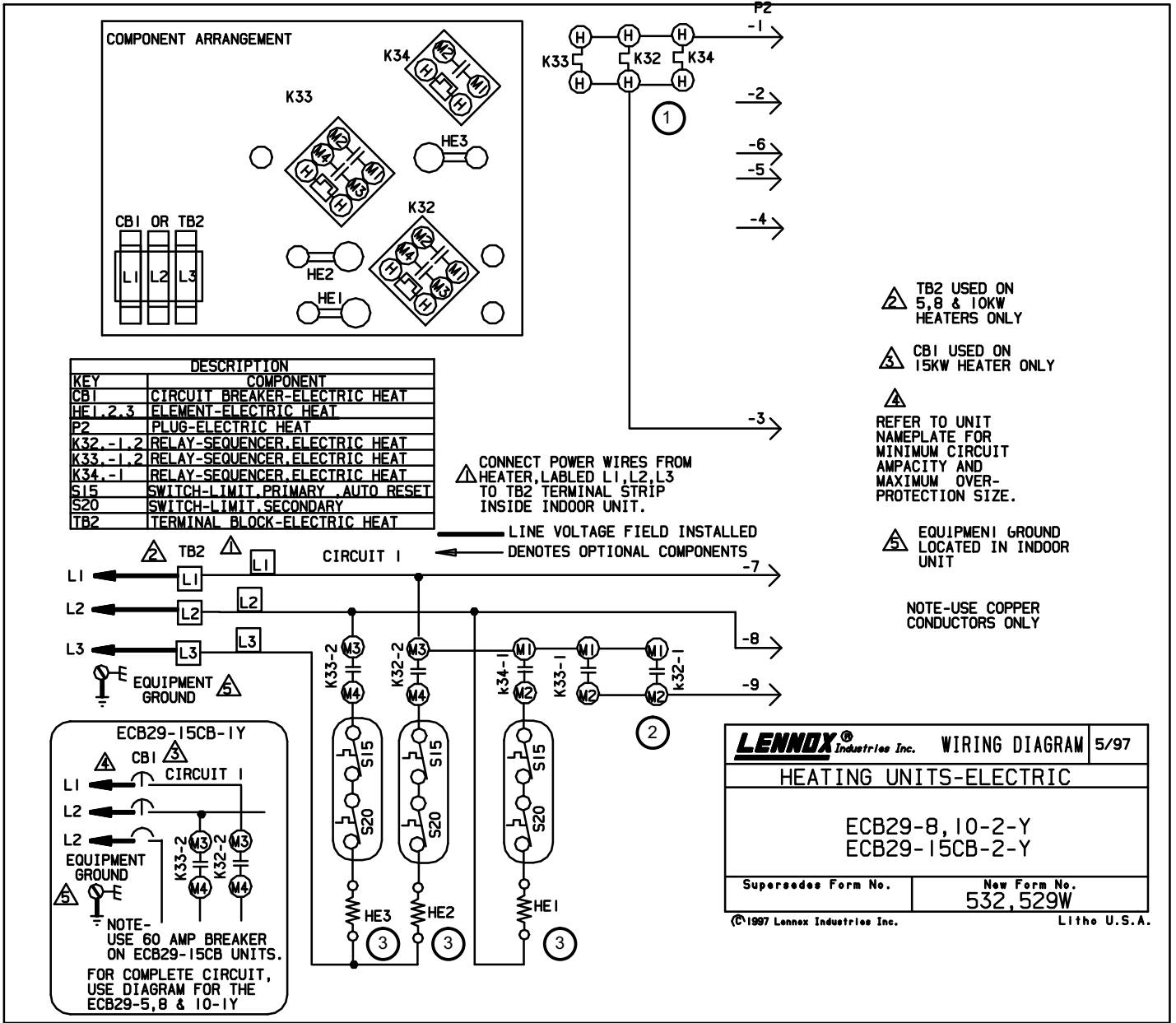
- 8- When K32-3 closes, the unit is ready for a third stage heat demand. W3, if available, of the thermostat sends a third stage heat demand, energizing the electric heat relays K35 and K117 with 24VAC.
- 9- When K35-2 and K117-1 close, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat elements HE4 and HE5 are energized. K35-1 closes until third stage heat demand is satisfied.



# H-ECB29 -8, -10, -15CB - 208/230V THREE PHASE - SEQUENCE OF OPERATION

- 1- When there is a call for heat, W1 of the thermostat energizes the electric heat relays K32, K33 and K34 with 24VAC.

2- When K32-1 and/or K33-1 closes, the blower is energized on heating speed and economizer heat relay K43
- is energized (see 208/230VAC CB schematic).
- 3- When K32-2, K33-2 and K34-1 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat elements HE1, HE2, and HE3 are energized.





# I-ECB29-20CB, -25CB - 208/230V THREE PHASE - SEQUENCE OF OPERATION

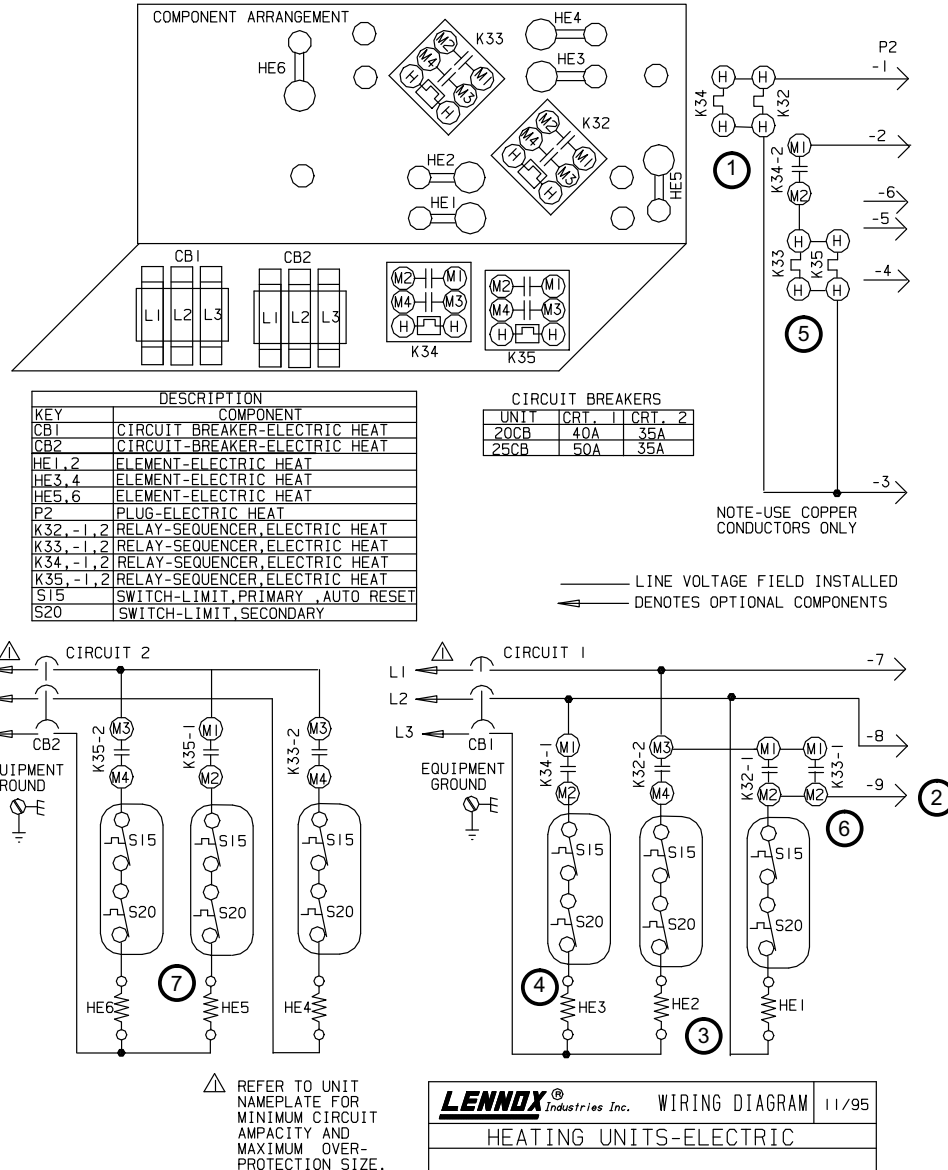
## FIRST STAGE HEAT

- 1- When there is a call for heat, W1 of the thermostat energizes the electric heat relays K32 and K34 with 24VAC.
- 2- When K32-1 closes, the blower is energized on heating speed and economizer heat relay K43 is energized (see 208/230VAC CB schematic).
- 3- When K32-1 and K32-2 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat elements HE1 and HE2 are energized.
- 4- When K34-1 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat element HE3 is energized.

## SECOND STAGE HEAT

(remove jumper between W2 and R)

- 5- When K34-2 closes, the unit is ready for a second stage heat demand. W2 of the thermostat sends a second stage heat demand, energizing the electric heat relays K33 and K35 with 24VAC.
- 6- When K33-1 closes, the blower (if not energized) is energized on heating speed and economizer heat relay K43 is energized (see 208/230VAC CB schematic).
- 7- When K33-1, K35-1, and K35-2 contacts close, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat elements HE4, HE5, and HE6 are energized.



|                               |  |                |       |
|-------------------------------|--|----------------|-------|
| <b>LENNOX</b> Industries Inc. |  | WIRING DIAGRAM | 11/95 |
| HEATING UNITS-ELECTRIC        |  |                |       |
| ECB29-20CB, 25CB-1-Y          |  |                |       |
| Supersedes Form No.           |  | New Form No.   |       |
|                               |  | 531, 707W      |       |
| ©1995 Lennox Industries Inc.  |  | Litho U.S.A.   |       |

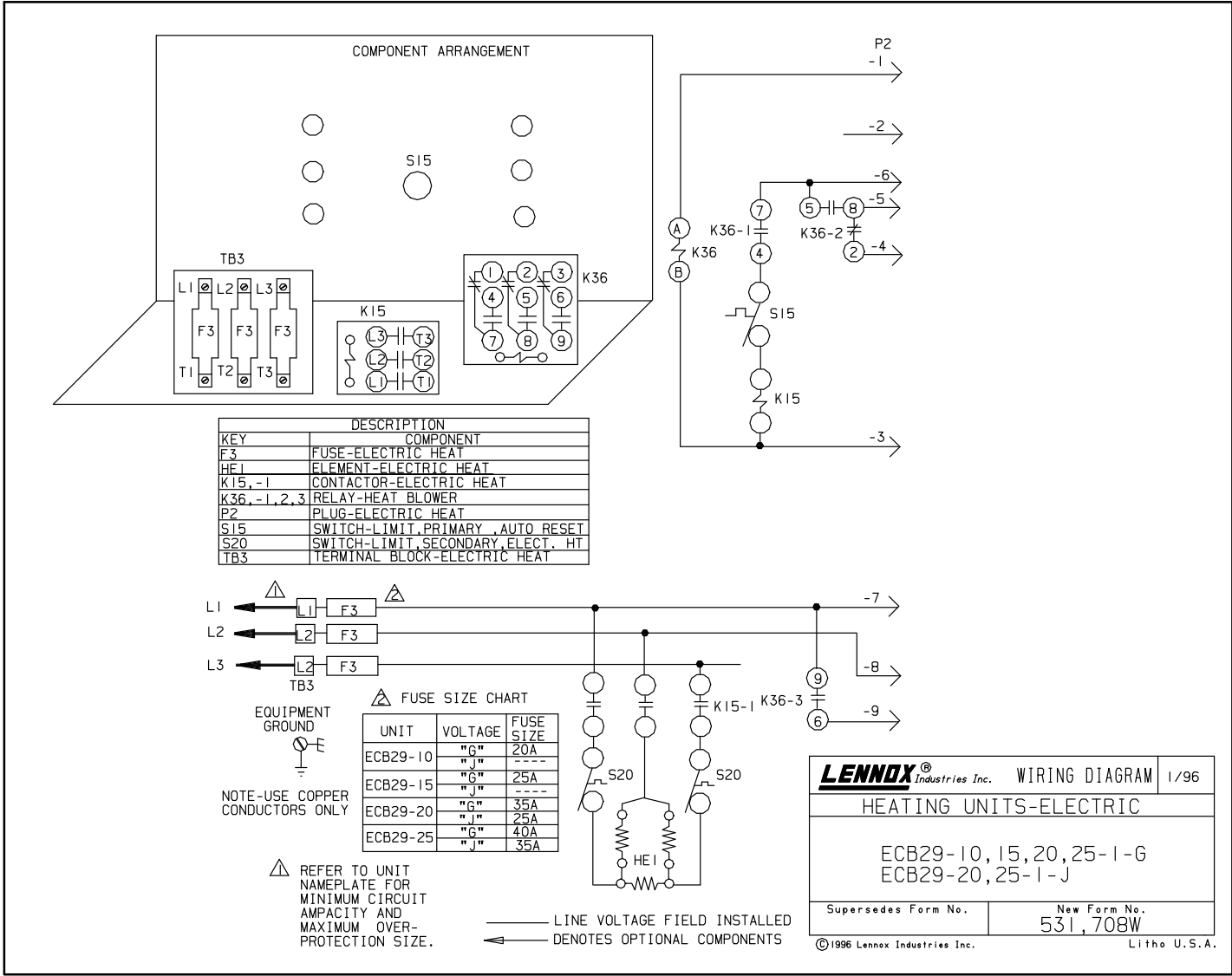
J-ECB29-10, -15, -20 and -25CB - 460V THREE PHASE - SEQUENCE OF OPERATION

FIRST STAGE HEAT

- 1- When there is a call for heat, W1 of the thermostat energizes the electric heat relays K32 and K34 with 24VAC.
- 2- When K32-1 closes, the blower is energized on heating speed and economizer heat relay K43 is energized (see 460VAC CB schematic).
- 3- When K32-1 and K32-2 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat elements HE1 and HE2 are energized.
- 4- When K34-1 closes, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat element HE3 is energized.

SECOND STAGE HEAT  
(remove jumper between W2 and R)

- 5- When K34-2 closes, the unit is ready for a second stage heat demand. W2 of the thermostat sends a second stage heat demand, energizing the electric heat relays K33 and K35 with 24VAC.
- 6- When K33-1 closes, the blower (if not energized) is energized on heating speed and economizer heat relay K43 is energized (see 208/230VAC CB schematic).
- 7- When K33-1, K35-1, and K35-2 contacts close, assuming the N.C. primary (S15) and secondary (S20) limit switches are closed, electric heat elements HE4, HE5, and HE6 are energized.



## K-CB27UH & CBX27UH with DEHUMIDIFICATION RELAY K183

### Operation Sequence

- 1-. If there is no dehumidification demand when 24 volts is applied to the system, the *SignatureStat*™ thermostat will send 24 volts to the K183 dehumidification relay coil. The normally-open relay contacts 5 and 9 will close and contacts 1 and 9 will open.
- 2-. If the total system static is higher than 0.49 in. w.g., a higher indoor blower speed may be needed to satisfy supply air requirements.
- 3-. The lower the indoor blower speed during dehumidification demands, without freezing the indoor coil, the better moisture removal. In Humiditrol® applications, this lower speed will increase the temperature rise on the Humiditrol® coil.
- 4-. When more than one motor tap is energized, built in logic gives the highest speed tap precedence.
- 5-. On a dehumidification call, the *SignatureStat*™ thermostat will remove 24 volt output from the "D" terminal; the "Y2" terminal (if available) becomes activated with 24 volts. This will de-energize K183 dehumidification relay and output 24 volts from Y2.

**NOTE - For any of the following configurations, refer to figure wiring diagram for proper system indoor blower fan speed tap selection.**

### Single Stage Systems

**Y1 cooling demand from the room thermostat with no dehumidification demand**—24 volts passes to the Y1 terminal on the coil blower. The factory jumper from Y1 and Y2 will direct the 24 volt signal through the closed set of contacts to the selected indoor blower cooling speed (factory set on Tap # 3 - white wire). Systems with total system statics between 0.50 and 0.80 in. w.g. may require a motor speed change.

**Y1 cooling demand with dehumidification demand**—K183 relay de-energizes. Contacts 5 and 9 open and isolate the cooling tap speed on the motor from the system. The room thermostat will still be calling for a Y1 demand, so 24 volts will still output from the Y1 and G terminals. The Y1 signal (factory jumpered to Y2 on the indoor unit's 24 volt terminal strip) will be isolated from the indoor blower motor by the opening of contacts 5 to 9 but the G signal will still be able to provide 24 volt power to the continuous indoor blower speed (factory set on Tap # 1 - green wire). Systems with total system statics between 0.50 and 0.80 in. w.g. may require a motor speed change.

### Two Stage Systems

**NOTE - Factory jumper wire between Y1 and Y2 on the indoor unit 24 volt terminal strip must be removed for two-stage systems.**

**Y1 cooling demand from the room thermostat with no dehumidification demand**—24 volts passes to the Y1 terminal on the coil blower. The Y1 demand will be isolated from the cooling tap speed on the indoor blower motor by removal of the jumper between Y1 and Y2 on the indoor unit's terminal strip on systems where the total system static is less than 0.50 in. w.g. The room thermostat outputs Y1 and G on a Y1 demand. The G signal from the room thermostat will still provide 24 volt power to the continuous indoor blower speed (factory set on Tap # 1 - green wire).

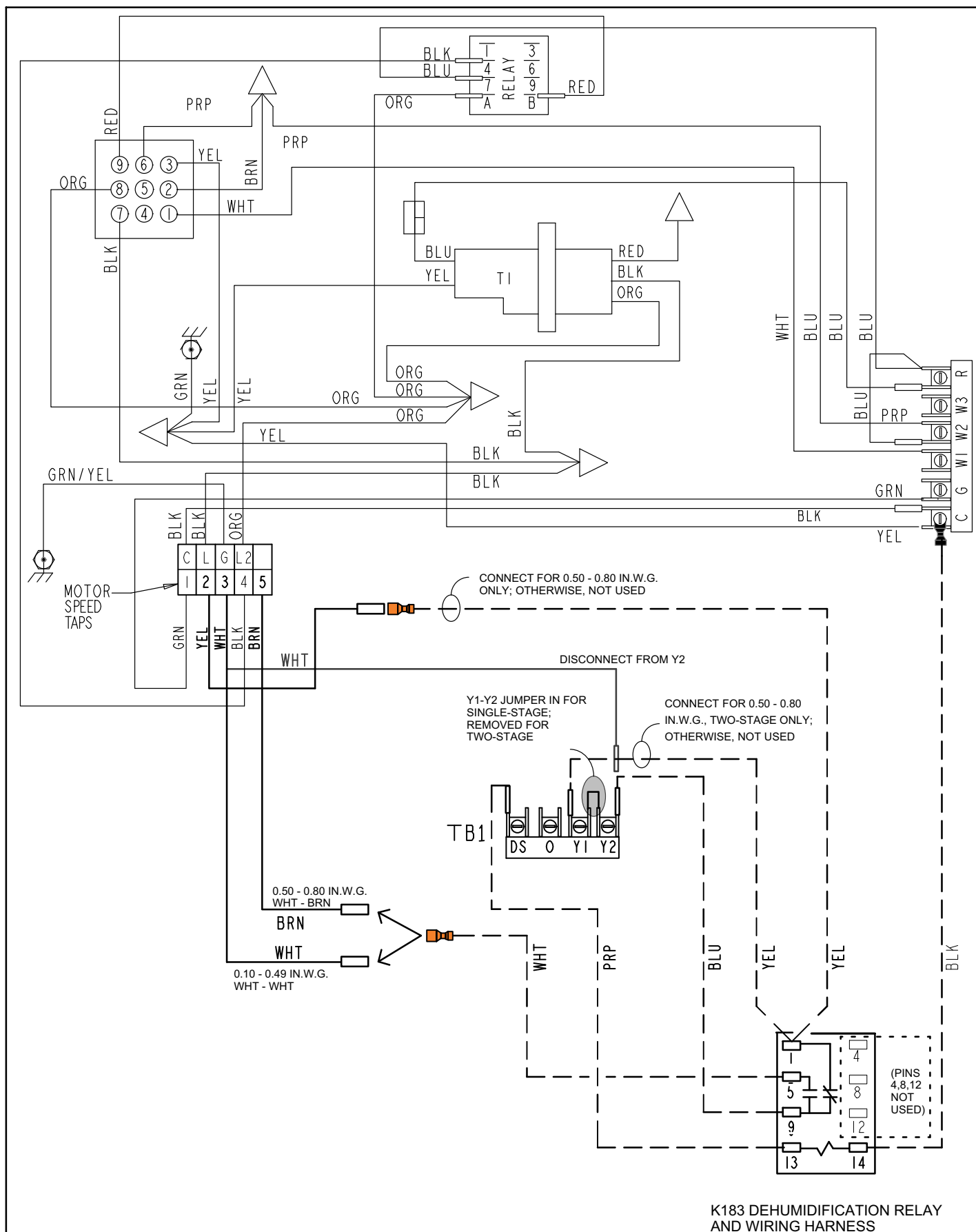
Systems with total system statics between 0.50 and 0.80 in. w.g. will require the yellow wires from the K183 relay terminal 1 to be connected to Y1 on the unit's indoor terminal strip and Tap # 2 (yellow from the indoor blower motor). The Y1 input from the indoor unit will allow the indoor blower motor to run on Tap # 2 - yellow wire.

The G signal from the room thermostat will still provide 24 volt power to the continuous indoor blower speed (factory set on Tap # 1 - green wire).

**Y2 cooling demand from the room thermostat with no dehumidification demand**—24 volts passes to the Y2 terminal on the coil blower. The Y2 demand will pass through closed relay contacts 5 and 9 to the selected indoor blower cooling speed (factory set on Tap # 3 - white wire). Systems with total system statics between 0.50 and 0.80 in. w.g. may require a motor speed change.

**Y1 or Y1/Y2 cooling demand with dehumidification demand**—K183 relay de-energizes and the room thermostat Y2 energizes. K183 relay contacts 5 and 9 will open and isolate the cooling blower speed on the motor from the system. The room thermostat will still be calling for a Y1, Y2, and G demand, so 24 volts will still be output to the terminal strip in the indoor coil blower. Y1 is not wired to the K183 relay, Y2 will send 24 volts through the K183 relay 9 to 1 closed contacts to the yellow wire that is not connected to the motor in systems where the total system static is less than 0.50 in. w.g. The G signal will still provide 24 volt power to motor Tap # 1 - Green wire. Indoor blower motor will run on Tap # 1 - Green wire. Systems with total system statics between 0.50 and 0.80 in. w.g. may require a motor speed change.

Systems with total system statics between 0.50 and 0.80 in. w.g. will require the yellow wires from the K183 relay terminal 1 to be connected to Y1 on the unit's indoor terminal strip and Tap # 2 - yellow from the indoor blower motor. The Y1 input from the indoor unit will allow the indoor blower motor to run on Tap # 2 - Yellow wire. The Y2 demand will go through K183 relay contacts 9 to 1 to indoor blower motor speed Tap # 2 - Yellow wire. The G signal will still provide 24 volt power to motor Tap # 1 - Green wire. The indoor blower motor will run on Tap # 2 - Yellow wire.



K183 DEHUMIDIFICATION RELAY AND WIRING HARNESS