

FOR INSTALLATION BY QUALIFIED SERVICE PERSONNEL ONLY

CONVERSION KIT INSTRUCTIONS

Commercial Electric Water heaters



⚠ CAUTION

TEXT PRINTED OR OUTLINED IN RED CONTAINS INFORMATION RELATIVE TO YOUR SAFETY. PLEASE READ THOROUGHLY BEFORE ATTEMPTING ANY CONVERSION.

FOREWORD

The purpose of this manual is to explain how to change the voltage and wattage of a commercial electric water heater by changing the elements. This manual is not intended to explain the rebuilding of electric water heaters in the field.

Addition of heating elements or subtraction of heating elements in the field is not approved by Underwriters Laboratories, Inc., and therefore, should not be attempted.

The heater to be converted and the appropriate conversion for the heater must be found on the same page of this manual. Read the instructions contained on pages 7 thru 11 before attempting any conversion.

SAFETY

Be sure to disconnect appliance from electrical supply before working on or near the electrical system of the heater. Never touch electrical components with wet hands or when standing in water.

REQUIRED ABILITY

CONVERSION OF ANY WATER HEATER LISTED IN THIS MANUAL REQUIRES ABILITY EQUIVALENT TO THAT OF A LICENSED ELECTRICAL TRADESMAN

CONTENTS

| <u>CONVERSION ALLOWED ON</u> | <u>PAGE</u> | <u>CONVERSION INSTRUCTIONS</u> | <u>PAGE</u> |
|---|-------------|--|-------------|
| 6 gallon, 1 Element, 120/277,208/240/480 V, 1 Phase, Two Wire Circuit | 3 | INTRODUCTION | 7 |
| Models with 1 Element, 120/277/208/240/280V, 1 Phase, Two Wire Circuit, (Except PCE-6) | 4 | HEATER PREPARATION | 7 |
| Models with 2 Elements, 120/277 V, 1 Phase, Non-Simultaneous or Simultaneous Four Wire Circuit..... | 5 | KW CONVERSION (Element Replacement)..... | 7 |
| Models with 2 Elements, 208/240/480 V, 1 Phase or 3 Phase, Simultaneous or Non-Simultaneous, Four Wire Circuit..... | 6 | VOLTAGE CONVERSION | 7 |
| | | PHASE CONVERSION | 7 |
| | | SIMULTANEOUS CONVERSION | 8 |
| | | CAUTION | 8 |
| | | FINAL ASSEMBLY..... | 9-11 |
| | | MISCELLANEOUS INFORMATION | 11 |

CONVERSION MATERIALS

1. Screw Plug Element Remover: 1-1/2" deep well socket and ratchet.
2. Screwdrivers: Two required, one #2 phillips and one slotted screwdriver.
3. Conversion kit: Includes conversion instructions, replacement electrical element(s), conversion kit label, caution label.
4. Thread sealer: When replacing screw-in type elements, be sure to use Dow Corning® silicone sealant (bathtub sealer) on threads.

® Dow Corning is a registered trademark of Dow Corning Corporation.

6 GALLON MODELS WITH 1 ELEMENT, 120/277/208/240/480 VOLT, 1 PHASE, TWO WIRE C-2 CIRCUIT

INSTRUCTIONS

1. Find the voltage and KW of the required heater.
2. On the same line, move to the right until you are in the column of the kit number required.
3. Order the corresponding kit.

See pages 7 thru 11 for detailed instructions.

| Total Voltage | Element KW Input | Kit Wattage | Number |
|---------------|------------------|-------------|------------|
| 120 | 1.5 | 1500 | 9003754005 |
| | 2.0 | 2000 | 9003755005 |
| | 2.5 | 2500 | 9003756005 |
| | 3.0 | 3000 | 9003757005 |
| 277 | 1.5 | 1500 | 9003758005 |
| | 2.0 | 2000 | 9003759005 |
| | 2.5 | 2500 | 9003760005 |
| | 3.0 | 3000 | 9003761005 |
| 208 | 1.5 | 1500 | 9003765005 |
| | 2.0 | 2000 | 9003766005 |
| | 2.5 | 2500 | 9003767005 |
| | 3.0 | 3000 | 9003768005 |
| 240 | 1.5 | 1500 | 9003774005 |
| | 2.0 | 2000 | 9003775005 |
| | 2.5 | 2500 | 9003776005 |
| | 3.0 | 3000 | 9003777005 |
| 480 | 2.5 | 2500 | 9003784005 |
| | 3.0 | 3000 | 9003785005 |

CHECK ALL WATER AND ELECTRICAL CONNECTIONS FOR TIGHTNESS

MODELS WITH 1 ELEMENT, 120/277/208/240/480 VOLT. 1 PHASE, TWO WIRE C-2 CIRCUIT (EXCEPT 6 GALLON)

INSTRUCTIONS

1. Find the voltage and KW of the required heater.
2. On the same line, move to the right until you are in the column of kit number required.
3. Order to corresponding kit.

See pages 7 thru 11 for detailed conversion instructions.

| Total Voltage | Element KW Input | Kit Wattage | Number |
|---------------|------------------|-------------|------------|
| 120 | 1.5 | 1500 | 9003754005 |
| | 2.0 | 2000 | 9003755005 |
| | 2.5 | 2500 | 9003756005 |
| | 3.0 | 3000 | 9003757005 |
| 277 | 1.5 | 1500 | 9003758005 |
| | 2.0 | 2000 | 9003759005 |
| | 2.5 | 2500 | 9003760005 |
| | 3.0 | 3000 | 9003761005 |
| | 4.0 | 4000 | 9003762005 |
| | 4.5 | 4500 | 9003763005 |
| 208 | 6.0 | 6000 | 9003764005 |
| | 1.5 | 1500 | 9003765005 |
| | 2.0 | 2000 | 9003766005 |
| | 2.5 | 2500 | 9003767005 |
| | 3.0 | 3000 | 9003768005 |
| | 3.5 | 3500 | 9003769005 |
| | 4.0 | 4000 | 9003770005 |
| | 4.5 | 4500 | 9003771005 |
| 240 | 5.0 | 5000 | 9003772005 |
| | 6.0 | 6000 | 9003773005 |
| | 1.5 | 1500 | 9003774005 |
| | 2.0 | 2000 | 9003775005 |
| | 2.5 | 2500 | 9003776005 |
| | 3.0 | 3000 | 9003777005 |
| | 3.5 | 3500 | 9003778005 |
| | 4.0 | 4000 | 9003779005 |
| | 4.5 | 4500 | 9003780005 |
| | 5.0 | 5000 | 9003781005 |
| 480 | 5.5 | 5500 | 9003782005 |
| | 6.0 | 6000 | 9003783005 |
| | 2.5 | 2500 | 9003784005 |
| | 3.0 | 3000 | 9003785005 |
| | 4.0 | 4000 | 9003786005 |
| | 4.5 | 4500 | 9003787005 |
| | 5.0 | 5000 | 9003788005 |
| | 6.0 | 6000 | 9003789005 |

CHECK ALL WATER AND ELECTRICAL CONNECTIONS FOR TIGHTNESS

MODELS WITH 2 ELEMENTS, 120/277 VOLT, 1 PHASE WITH NON-SIMULTANEOUS OR SIMULTANEOUS FOUR WIRE A-8 CIRCUIT

INSTRUCTIONS

1. Find the voltage and KW of the required heater.
2. On the same line, move to the right until you are in the column of kit number required.
3. Order to corresponding kit.

See pages 7 thru 11 for detailed conversion instructions.

| Voltage | Total KW Input | | Element Wattage | Kit Number |
|---------|------------------------|----------------------------|-----------------|------------|
| | Simultaneous Operation | Non-Simultaneous Operation | | |
| 120 | 3 | 1.5 | 1500 | 9003744005 |
| | 4 | 2.0 | 2000 | 9003745005 |
| | 5 | 2.5 | 2500 | 9003746005 |
| | * | 3.0 | 3000 | 9003814005 |
| 277 | 3 | 1.5 | 1500 | 9003747005 |
| | 4 | 2.0 | 2000 | 9003748005 |
| | 5 | 2.5 | 2500 | 9003749005 |
| | 6 | 3.0 | 3000 | 9003750005 |
| | 8 | 4.0 | 4000 | 9003751005 |
| | 9 | 4.5 | 4500 | 9003752005 |
| | 12 | 6.0 | 6000 | 9003753005 |

* Cannot convert to Simultaneous Operation Mode.

CHECK ALL WATER AND ELECTRICAL CONNECTIONS FOR TIGHTNESS

MODELS WITH 2 ELEMENTS, 208/240/480 VOLT, 1 PHASE OR 3 PHASE, WITH SIMULTANEOUS OR NON-SIMULTANEOUS FOUR WIRE A-8 CIRCUIT

INSTRUCTIONS

1. Find the voltage and KW of the required heater.
2. On the same line, move to the right until you are in the column of kit number required.
3. Order to corresponding kit.

See pages 7 thru 11 for detailed conversion instructions.

| Voltage | Total KW Input | Element Wattage | Kit Number |
|---------|----------------|-----------------|------------|
| 208 | 2.0 | 1000 | 9003790005 |
| | 3.0 | 1500 | 9003791005 |
| | 4.0 | 2000 | 9003792005 |
| | 5.0 | 2500 | 9003793005 |
| | 6.0 | 3000 | 9003794005 |
| | 7.0 | 3500 | 9003795005 |
| | 8.0 | 4000 | 9003796005 |
| | 9.0 | 4500 | 9003797005 |
| 240 | *10 | 5000 | 9003798005 |
| | 3.0 | 1500 | 9003799005 |
| | 4.0 | 2000 | 9003800005 |
| | 5.0 | 2500 | 9003801005 |
| | 6.0 | 3000 | 9003802005 |
| | 7.0 | 3500 | 9003803005 |
| | 8.0 | 4000 | 9003804005 |
| | 9.0 | 4500 | 9003805005 |
| 480 | 10.0 | 5000 | 9003806005 |
| | 11.0 | 5500 | 9003807005 |
| | 5.0 | 2500 | 9003808005 |
| | 6.0 | 3000 | 9003809005 |
| | 8.0 | 4000 | 9003810005 |
| | 9.0 | 4500 | 9003811005 |
| | 10.0 | 5000 | 9003812005 |
| | 12.0 | 6000 | 9003813005 |

* Only available on 3Ph Simultaneous.

CHECK ALL WATER AND ELECTRICAL CONNECTIONS FOR TIGHTNESS

CONVERSION INSTRUCTIONS

REQUIRED ABILITY

CONVERSION OF ANY WATER HEATER LISTED IN THIS MANUAL REQUIRES ABILITY EQUIVALENT TO THAT OF A LICENSED ELECTRICAL TRADESMAN

I. INTRODUCTION

Satisfying a customer order for a electric heater from inventory may require modification to the KW input, the voltage, or the phase. Conversions may involve revision to 1, 2, or all 3 of these electrical characteristics.

II. HEATER PREPARATION

The heater should be placed in a well lit area. Complete removal of the shipping carton is not required. Locate front of carton (opposite side of heater identification label). Cut a 3-sided flap into front of carton, cut should be on top, bottom and right side approximately 4" from carton edges. Leave the left side of the flap as a hinge. Cuts made 4" from the edge of carton will permit proper reclosure when conversion is completed.

Remove the two control panel screws on the water heater door(s).

To expose elements, fold insulation from right to left. DO NOT RIP INSULATION. Remove the personnel protector(s). Take care not to damage protector.

III. KW CONVERSION (ELEMENT REPLACEMENT)

- A. Remove wires from one element at a time.
- B. Remove element from heater using 1-1/2" deep well socket and ratchet. Return the elements to appropriate bin.
- C. Open the appropriate conversion kit and remove the element(s). Check each element head to ensure correct voltage and wattage.
- D. Install the new element with a 1-1/2" socket wrench. A new "O" ring gasket should be installed on each element. Element threads should be lubricated with Dow Corning® silicone sealant (or equal). Screw element into fitting until it seats. Tighten 1/2" to 3/4" turn with wrench.
- E. Rewire the element, Screw terminals must be snug, however, caution must be exercised. Overtightening may break the terminal block, requiring replacement of the element.
- F. Repeat steps A thru E for all other elements being replaced.

IV. VOLTAGE CONVERSION

- A. DO NOT CHANGE THE GROUND CONNECTIONS.

V. PHASE CONVERSION

- A. THREE PHASE TO SINGLE PHASE
 1. Disconnect black wire from terminal L-3.
 2. Connect black wire to terminal L-2 (with blue wire).
 3. Incoming power will be connected to terminals L-1 and L-2 at job site.

VI. SIMULTANEOUS CONVERSION

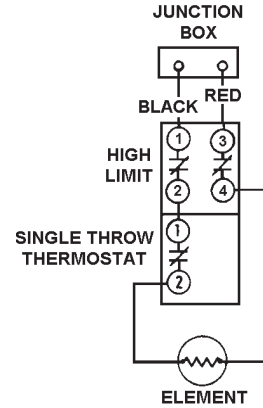
1. Disconnect red wire from power terminal "J".
2. Reconnect red wire to terminal L1, along with yellow wire on terminal block.

*See diagram below. Note: Steps V and VI pertain only to conversions on page 7 of this manual.

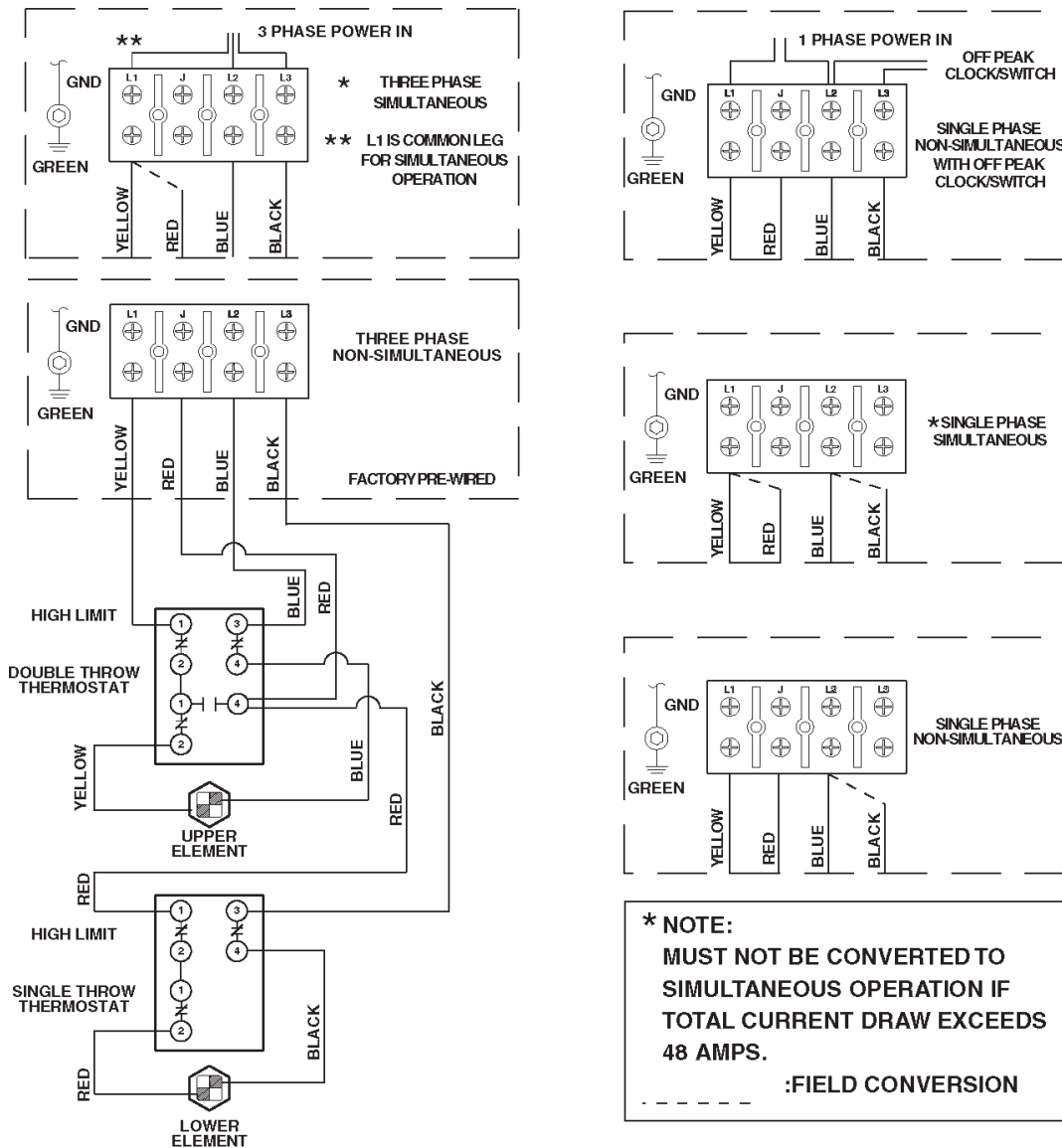
⚠ CAUTION

Recheck all terminals for tightness, proper wiring per schematic, and neatness of wiring. Heater should be no less than factory constructed quality and appearance.

TWO WIRE C-2 CIRCUIT FOR SINGLE ELEMENT HEATERS



FOUR WIRE A-8 CIRCUIT FOR DUAL ELEMENT HEATER




V. FINAL ASSEMBLY

A. CONTROL COVER(S)

Replace personnel protector(s). Unfold insulation blanket. Cover all elements and thermostats as originally constructed. Replace door and tighten the two screws.

B. RATING PLATE MODIFICATION OF DUAL ELEMENTS ELECTRIC WATER HEATERS.

Following is a sample of the standard rating plate supplied on the front of dual elements commercial electric water heaters.


| | | | | | | | | |
|---|-------|----------------|----------------|---|-----------------------|--------------------------|---|--|
| COMMERCIAL STORAGE TANK WATER HEATER | | | | | | |  | |
| MODEL NUMBER | | SERIAL NUMBER | | | ITEM ID / PART NUMBER | | | |
| | | | | | | | | |
| VOLTS - AC | PHASE | WATTS UPPER | WATTS LOWER | CIRCUIT | CAPACITY US GALS | MAX. WORKING PRESSURE | | |
| | | | | | | | | |
| TOTAL WATTS CONNECTED INTERLOCK SIMULTANEOUS | | | | CITY OF NEW YORK DEPT. OF BUILDING MEA | | | | |
| | | | | | | | | |

| | | | |
|---|-------|----------------|----------------|
| VOLTS - AC | PHASE | WATTS UPPER | WATTS LOWER |
| X | X | X | X |
| TOTAL WATTS CONNECTED INTERLOCK SIMULTANEOUS | | | |
| X | | X | |

(Part No. 195205-000)


The volts, phase and watts information of the rating plate must be modified by covering them with conversion label (Part No. 195205) provided in the conversion kit. Be sure the new ratings on the label match the conversion you have just completed.

Peel off the back of label and paste over the area shown on the revised rating plate below.

| | | | | | | | | |
|---|-------|----------------|----------------|---|-----------------------|--------------------------|--|--|
| COMMERCIAL STORAGE TANK WATER HEATER | | | | | | |  | |
| MODEL NUMBER | | SERIAL NUMBER | | | ITEM ID / PART NUMBER | | | |
| | | | | | | | | |
| VOLTS - AC | PHASE | WATTS UPPER | WATTS LOWER | CIRCUIT | CAPACITY US GALS | MAX. WORKING PRESSURE | | |
| X | X | X | X | | | | | |
| TOTAL WATTS CONNECTED INTERLOCK SIMULTANEOUS | | | | CITY OF NEW YORK DEPT. OF BUILDING MEA | | | | |
| X | | X | | | | | | |


C. RATING PLATE MODIFICATION OF SINGLE ELEMENT ELECTRIC WATER HEATERS

The following is a sample of the standard rating plate supplied on the front of single element electric water heaters.

| | | | | | | |
|--|-------|---|----------------|---|---------------------|--------------------------|
| HOUSEHOLD STORAGE TANK WATER HEATER | |  | | LISTED 22UL | | |
| MODEL NUMBER | | SERIAL NUMBER | | ITEM ID / PART NUMBER | | |
| | | | | | | |
| VOLTS - AC | PHASE | WATTS UPPER | WATTS LOWER | TOTAL WATTS CONNECTED | CAPACITY US GALS | MAX. WORKING PRESSURE |
| | | | | | | |
| CIRCUIT | | | | CITY OF NEW YORK DEPT. OF BUILDING MEA | | |
| | | | | | | |

| | | | | | | | | | | | | | | |
|--|-------|----------------|----------------|--------------------------|------------|-------|----------------|----------------|--------------------------|---|---|---|---|---|
| <table border="1"> <tr> <td>VOLTS - AC</td> <td>PHASE</td> <td>WATTS UPPER</td> <td>WATTS LOWER</td> <td>TOTAL WATTS CONNECTED</td> </tr> <tr> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> </table> | | | | | VOLTS - AC | PHASE | WATTS UPPER | WATTS LOWER | TOTAL WATTS CONNECTED | X | X | X | X | X |
| VOLTS - AC | PHASE | WATTS UPPER | WATTS LOWER | TOTAL WATTS CONNECTED | | | | | | | | | | |
| X | X | X | X | X | | | | | | | | | | |
| <p>(Part No. 195204-000)</p> <p>The volts, phase and watts information of the rating plate must be modified by covering them with conversion label (Part No. 195204) provided in the conversion kit. Be sure the new ratings on the label match the conversion you have just completed.</p> | | | | | | | | | | | | | | |

Peel off the back of the label and paste over the area as shown on the revised rating plate below.

| | | | | | | |
|--|-------|--|----------------|---|---------------------|--------------------------|
| HOUSEHOLD STORAGE TANK WATER HEATER | |  | | LISTED 22U1 | | |
| MODEL NUMBER | | SERIAL NUMBER | | ITEM ID / PART NUMBER | | |
| | | | | | | |
| VOLTS - AC | PHASE | WATTS UPPER | WATTS LOWER | TOTAL WATTS CONNECTED | CAPACITY US GALS | MAX. WORKING PRESSURE |
| X | X | X | X | X | | |
| CIRCUIT | | | | CITY OF NEW YORK DEPT. OF BUILDING MEA | | |
| | | | | | | |

D. CAUTION LABEL

Peel off back of caution label and place as near to rating plate as possible, taking care not to cover any existing labels.

E. CARTON IDENTIFICATION

Using a black magic marker, cross out heater identification on carton as appropriate. In bold letters, write new electrical specifications on carton, matching those on the revised rating plate.

Close and tape the cardboard flap on front of carton.

F. SHIPPING CARTON

Close and tape the cardboard flap on the front of carton.



NEVER OPERATE THE HEATER WITHOUT FILLING WITH WATER PER THE FILLING INSTRUCTIONS. FAILURE TO DO SO WILL DAMAGE INTERNAL PARTS.

IX. MISCELLANEOUS INFORMATION

FULL LOAD CURRENT IN AMPERES

| KW Input | Single (1) Phase | | | | | Three (3) Phase | | |
|----------|------------------|------|------|------|------|-----------------|-----------|-----------|
| | 120V | 208V | 240V | 277V | 480V | 208V | 240V | 480V |
| 1.5 | 12.5 | 7.2 | 6.3 | 5.4 | | | | |
| 2.0 | 16.7 | 9.6 | 8.3 | 7.2 | | 8.3/4.8 | | |
| 2.5 | 20.8 | 12.0 | 10.4 | 9.0 | 5.2 | | | |
| 3.0 | 25.0 | 14.4 | 12.5 | 10.8 | 6.3 | 12.5/7.2 | 10.8/6.3 | |
| 3.5 | | 16.8 | 14.6 | | | | | |
| 4.0 | | 19.2 | 16.7 | 14.4 | 8.3 | 16.7/9.6 | 14.4/8.3 | |
| 4.5 | | 21.6 | 18.8 | 16.2 | 9.4 | | | |
| 5.0 | | 24.0 | 20.8 | | 10.4 | 20.8/12.0 | 18.0/10.4 | 9.0/5.2 |
| 5.5 | | | 22.9 | | | | | |
| 6.0 | | 28.8 | 25.0 | 21.7 | 12.6 | 25.0/14.4 | 21.7/12.5 | 10.8/6.3 |
| 7.0 | | 33.6 | 29.2 | | | 29.1/16.8 | 25.3/14.6 | |
| 8.0 | | 38.6 | 33.4 | | 16.6 | 33.3/19.2 | 28.9/16.7 | 14.4/8.3 |
| 9.0 | | 43.2 | 37.6 | | 18.8 | 37.5/21.6 | 32.5/18.8 | 16.2/9.4 |
| 10.0 | | 48.0 | 41.6 | | 20.8 | 41.6/24.0 | 36.1/20.8 | 18.0/10.4 |
| 11.0 | | | 45.8 | | | 46.0/26.5 | 39.7/22.9 | |
| 12.0 | | | | 43.3 | 25.2 | | 43.5/25.0 | 21.7/12.5 |

