



| EXCHANGER SIZE | DIMENSIONS |      |         |      |         |      |        |      |        |     |        |     |        |     |        |     |
|----------------|------------|------|---------|------|---------|------|--------|------|--------|-----|--------|-----|--------|-----|--------|-----|
|                | A          |      | B       |      | C       |      | D      |      | E      |     | F      |     | N1     |     | N2     |     |
|                | inches     | mm   | inches  | mm   | inches  | mm   | inches | mm   | inches | mm  | inches | mm  | inches | mm  | inches | mm  |
| WS-283-4E4     | 81 3/8     | 2067 | 33 3/4  | 857  | 18 3/4  | 476  | 43     | 1092 | 19 1/4 | 489 | 27 1/2 | 699 | 12     | 305 | 4      | 102 |
| WS-284-4E4     | 93 3/8     | 2435 | 45 3/4  | 1162 | 29 5/8  | 752  | 55     | 1397 | 19 1/4 | 489 | 27 1/2 | 699 | 12     | 305 | 4      | 102 |
| WS-285-4E4     | 106 5/8    | 2708 | 58 3/8  | 1483 | 42 1/4  | 1073 | 67     | 1702 | 19 1/4 | 489 | 27 1/2 | 699 | 14     | 356 | 4      | 102 |
| WS-286-4E4     | 120 5/8    | 3064 | 70 3/8  | 1788 | 52 5/8  | 1337 | 79     | 2007 | 20 1/4 | 514 | 29 1/2 | 749 | 16     | 406 | 6      | 152 |
| WS-287-4E4     | 132 5/8    | 3369 | 82 3/8  | 2092 | 63 5/8  | 1616 | 91     | 2311 | 20 1/4 | 514 | 29 1/2 | 749 | 16     | 406 | 6      | 152 |
| WS-288-4E4     | 146 5/8    | 3724 | 95 3/8  | 2423 | 76 5/8  | 1946 | 103    | 2616 | 20 1/4 | 514 | 29 1/2 | 749 | 18     | 457 | 6      | 152 |
| WS-289-4E4     | 158 5/8    | 4029 | 107 3/8 | 2727 | 87 5/8  | 2226 | 115    | 2921 | 20 1/4 | 514 | 29 1/2 | 749 | 18     | 457 | 6      | 152 |
| WS-2810-4E4    | 172 5/8    | 4385 | 120 3/8 | 3058 | 100 7/8 | 2556 | 127    | 3226 | 20 1/4 | 514 | 29 1/2 | 749 | 20     | 508 | 6      | 152 |
| WS-2811-4E4    | 186 5/8    | 4740 | 132 3/8 | 3362 | 111 1/8 | 2823 | 139    | 3531 | 21 1/2 | 546 | 32     | 813 | 22     | 559 | 8      | 203 |
| WS-2812-4E4    | 198 5/8    | 5045 | 144 1/8 | 3661 | 122 1/8 | 3102 | 151    | 3835 | 21 1/2 | 546 | 32     | 813 | 22     | 559 | 8      | 203 |
| WS-2813-4E4    | 210 5/8    | 5350 | 156 1/8 | 3966 | 134 1/8 | 3407 | 163    | 4140 | 21 1/2 | 546 | 32     | 813 | 22     | 559 | 8      | 203 |
| WS-2814-4E4    | 224 5/8    | 5705 | 167 7/8 | 4264 | 144 5/8 | 3673 | 175    | 4445 | 22 3/4 | 578 | 34 1/2 | 876 | 24     | 610 | 10     | 254 |
| WS-2815-4E4    | 236 5/8    | 6010 | 179 7/8 | 4569 | 156 5/8 | 3978 | 187    | 4750 | 22 3/4 | 578 | 34 1/2 | 876 | 24     | 610 | 10     | 254 |

| NOZZLE SCHEDULE |      |                            |      |                        |
|-----------------|------|----------------------------|------|------------------------|
| SERVICE         | MARK | SHELL SIDE                 | MARK | TUBE SIDE              |
| INLET           | (N1) | AS PER TABLE ANSI (RF) FLG | (N5) | 10 (254) ANSI (RF) FLG |
| OUTLET          | (N2) | AS PER TABLE ANSI (RF) FLG | (N6) | 10 (254) ANSI (RF) FLG |
| DRAIN           | (N3) | 3/4 (19) NPT               | (N7) | 3/4 (19) NPT           |
| VENT            | (N4) | 3/4 (19) NPT               |      |                        |

**NOTES:** 1. SUPPORTS SUPPLIED ONLY IF SPECIFIED ON ORDER.  
 2. NOZZLE SIZES SHOWN ARE RECOMMENDED FOR MAXIMUM EXCHANGER LIFE.  
 3. FABRICATED TO ASME CODE SECTION VIII DIVISION 1 AND LATEST ADDENDA.  
 4. DRAWING IS NOT TO SCALE.  
 5. ALL DIM'S ±1/8 (3) UNLESS OTHERWISE SHOWN.

| DESIGN CONDITIONS       |                     |                     |
|-------------------------|---------------------|---------------------|
|                         | SHELL               | TUBES               |
| DESIGN PRESSURE         | 150 PSIG (1034 kpo) | 150 PSIG (1034 kpo) |
| DESIGN TEMPERATURE      | 375 °F (191 °C)     | 375 °F (191 °C)     |
| MIN. DESIGN METAL TEMP. | 40 °F (4.4°C)       | 40 °F (4.4°C)       |
| HYDRO. TEST PRESSURE    | 225 PSIG (1551 kpo) | 225 PSIG (1551 kpo) |
| CONTENTS                | STEAM               | WATER               |

**CUSTOMER:**  
**LOCATION:**  
**ORDER No.:**  
**PROJECT/JOB:**  
**LOCATION:**  
**TAG:** (QUOTE # )

|   |  |   |   |
|---|--|---|---|
| <b>TITLE</b> 150 LB. W SERIES HEAT EXCHANGERS | <b>A R M S T R O N G</b>                         | <b>NUMBER</b> WS-28-4P-E4                     | <b>REV.</b>                                 |
| <b>DATE</b> :-SEP./15/99 <b>BY</b> :- AP/AG   | <b>TORONTO - CANADA</b> TEL : (416) 755-2291     | <b>MONTREAL - CANADA</b> TEL : (514) 421-2424 | <b>BUFFALO - N. Y.</b> TEL : (716) 693-8813 |
|   | <b>COLCHESTER - U.K.</b> TEL : (44) 120-657-9491 |   |   |