



**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT  
FACILITIES DEVELOPMENT DIVISION**

**APPLICATION FOR OSHPD SPECIAL SEISMIC  
CERTIFICATION PREAPPROVAL (OSP)**

OFFICE USE ONLY

APPLICATION #: **OSP-0333-10**

**OSHPD Special Seismic Certification Preapproval (OSP)**

Type:  New  Renewal

**Manufacturer Information**

Manufacturer: TRANE

Manufacturer's Technical Representative: Tom Troyanek

Mailing Address: 3600 Pammel Creek Road, La Crosse, WI 54601

Telephone: (608) 787-3447 Email: ttroyanek@trane.com

**Product Information**

Product Name: TR200 Drives & Panels

Product Type: Variable Frequency Drives

Product Model Number: D1h, D2h, D5h, D6h, D7h & D8h frame sizes. See attachments for additional information.  
(List all unique product identification numbers and/or part numbers)

General Description: Variable frequency drives for the control of induction motors.

Mounting Description: Rigid base mounted, rigid wall mounted and rigid wall/floor mounted. See attachments.

**Applicant Information**

Applicant Company Name: EASE Co.

Contact Person: JONATHAN ROBERSON, S.E.

Mailing Address: 5877 Pine Ave. Suite 210, Chino Hills, CA 91709

Telephone: (406) 541-EASE (3273) Email: J.Roberson@EASECo.com

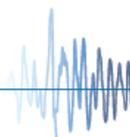
I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2013.

Signature of Applicant:  Date: 1/31/13

Title: Principal Engineer Company Name: EASE Co.

"Access to Safe, Quality Healthcare Environments that Meet California's Diverse and Dvnamic Needs"

STATE OF CALIFORNIA – HEALTH AND HUMAN SERVICES AGENCY  
OSH-FD-759 (REV 1/24/13)



osHPD



**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT  
FACILITIES DEVELOPMENT DIVISION**

**California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)**

Company Name: EASE Co.

Name: JONATHAN ROBERSON, S.E. California License Number: S4197

Mailing Address: 5877 Pine Ave. Suite 210, Chino Hills, CA 91709

Telephone: (909) 606-7622 Email: J.Roberson@EASECo.com

**Supports and Attachments Preapproval**

- Supports and attachments are preapproved under OPM- \_\_\_\_\_  
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)
- Supports and attachments are not preapproved

**Certification Method**

- Testing in accordance with:  ICC-ES AC156
- Other (Please Specify): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

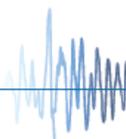
**Testing Laboratory**

Company Name: Environmental Testing Laboratory, Inc.

Contact Name: Brady Richard

Mailing Address: 11034 Indian Trail, Dallas, TX 75229-3513

Telephone: (972) 247-9657 Email: brady@etldallas.com





**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT  
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**Seismic Parameters**

Design in accordance with ASCE 7-10 Chapter 13:  Yes  No

Design Basis of Equipment or Components ( $F_p/W_p$ ) = 1.95g

$S_{DS}$  (Design spectral response acceleration at short period, g) = 2.6

$a_p$  (In-structure equipment or component amplification factor) = 2 1/2

$R_p$  (Equipment or component response modification factor) = 6

$\Omega_0$  (System overstrength factor) = 2 1/2

$I_p$  (Importance factor) = 1.5

$z/h$  (Height factor ratio) = 1

Equipment or Component Natural Frequencies (Hz) = See Attachment 2

Overall dimensions and weight (or range thereof) = See Attachment 1

Equipment or Components @ grade designed in accordance with ASCE 7-10 Chapter 15:  Yes  No

Design Basis of Equipment or Components ( $V/W$ ) = \_\_\_\_\_

$S_{DS}$  (Design spectral response acceleration at short period, g) = \_\_\_\_\_

$S_{D1}$  (Design spectral response acceleration at 1 second period, g) = \_\_\_\_\_

$R$  (Response modification coefficient) = \_\_\_\_\_

$\Omega_0$  (System overstrength factor) = \_\_\_\_\_

$C_d$  (Deflection amplification factor) = \_\_\_\_\_

$I_p$  (Importance factor) = 1.5

Height to Center of Gravity above base = \_\_\_\_\_

Equipment or Component Natural Frequencies (Hz) = \_\_\_\_\_

Overall dimensions and weight (or range thereof) = \_\_\_\_\_

Tank(s) designed in accordance with ASME BPVC, 2010:  Yes  No

**List of Attachments Supporting Special Seismic Certification**

Test Report(s)  Drawings  Calculations  Manufacturer's Catalog

Other(s) (Please Specify): Attachments 1 & 2

**OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2019**

Signature:  Date: July 24, 2013

Print Name: Timothy J. Piland Title: SSE

Special Seismic Certification Valid Up to :  $S_{DS}$  (g) = 2.60  $z/h$  = 1.0

Condition of Approval (if applicable): \_\_\_\_\_



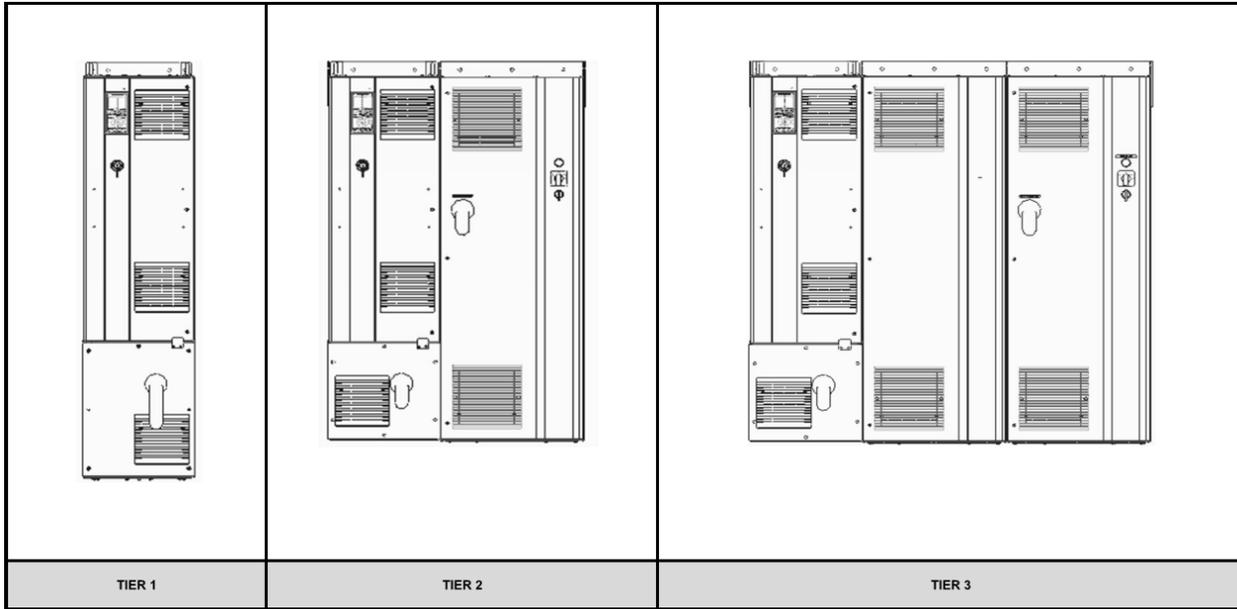
**ATTACHMENT 1: SEISMIC CERTIFIED COMPONENTS**

**TABLE 1: TRANE TR200 DRIVE & CLASSIC PANEL CHARACTERISTICS**

| Product Line                     | REVISED D-FRAME DRIVE MODEL<br>TRANE TR200 Drives   |                              |                          | BASE DRIVE MODEL<br>TR-200 |       |        | CLASSIC PANEL<br>T200 |            |                      |
|----------------------------------|---|------------------------------|--------------------------|----------------------------|-------|--------|-----------------------|------------|----------------------|
| FRAME SIZE                       | DRIVE <sup>[1]</sup><br>HP RANGE  | DRIVE / PANEL <sup>[2]</sup> | TYPE CODE <sup>[3]</sup> | MAX. DIMENSIONS (IN.)      |       |        | MAX WT<br>(LBS.)      | MOUNT      | BASIS <sup>[4]</sup> |
|                                  |   |                              |                          | WIDTH                      | DEPTH | HEIGHT |                       |            |                      |
| D1h                              | 75 – 250  | Drive                        | TR-200*                  | 12.8                       | 14.9  | 35.5   | 165                   | Wall       | UUT-1                |
|                                  |   | Tier 2                       | T200*                    | 29.7                       | 16.4  | 47.6   | 420                   | Wall       | INT                  |
|                                  |   | Tier 3                       | T200*                    | 46.3                       | 16.4  | 47.6   | 585                   | Wall       | INT                  |
| D2h                              | 250 – 450   | Drive                        | TR-200*                  | 16.5                       | 14.9  | 43.6   | 283                   | Wall       | INT                  |
|                                  |   | Tier 2                       | T200*                    | 33.5                       | 16.4  | 62.6   | 630                   | Wall       | INT                  |
|                                  |   | Tier 3                       | T200*                    | 50.1                       | 16.4  | 62.6   | 1070                  | Wall       | UUT-3                |
| D5h                              | 75 – 250  | Drive / Tier 1               | TR-200*                  | 12.8                       | 15.0  | 52.1   | 219                   | Wall       | INT                  |
| D6h                              | 250 – 450   | Drive / Tier 1               | TR-200*                  | 12.8                       | 15.0  | 65.6   | 290                   | Wall       | UUT-2                |
| <b>DRIVES WITH PEDESTAL BASE</b> |   |                              |                          |                            |       |        |                       |            |                      |
| D1h                              | 75 – 250  | Drive / Tier 1               | TR-200*                  | 12.8                       | 14.9  | 51.2   | 176                   | Floor      | UUT-4                |
|                                  |   |                              |                          |                            |       |        |                       | Wall/Floor | UUT-5                |
| D2h                              | 250 – 450   | Drive / Tier 1               | TR-200*                  | 16.5                       | 14.9  | 59.3   | 300                   | Wall/Floor | INT                  |
| D5h                              | 75 – 250  | Drive / Tier 1               | TR-200*                  | 12.8                       | 15.0  | 60.0   | 255                   | Wall/Floor | INT                  |
| D6h                              | 250 – 450   | Drive / Tier 1               | TR-200*                  | 12.8                       | 15.0  | 73.4   | 301                   | Wall/Floor | INT                  |
| D7h                              | 75 – 250  | Drive / Tier 1               | TR-200*                  | 16.5                       | 15.1  | 77.9   | 407                   | Wall/Floor | INT                  |
| D8h                              | 250 – 450   | Drive / Tier 1               | TR-200*                  | 16.5                       | 15.8  | 89.9   | 540                   | Wall/Floor | UUT-6                |
| Certified Enclosure              | IP 21 / UL Type 1 / NEMA Type 1<br>IP 54 / UL Type 12 / NEMA Type 12<br>Carbon steel back panel with extruded aluminum sides and front cover.   |                              |                          |                            |       |        |                       |            |                      |
| Certified Mounting               | <u>Floor (Rigid Base)</u> : a free-standing, base mounted condition with the component rigidly attached to a supporting structure and no lateral support above the base.<br><u>Wall/Floor</u> : component is rigidly attached to a supporting structure at its base, with additional lateral restraint at the top anchoring the component to an adjacent wall or other supporting structure.<br><u>Wall</u> : fully supported by a building wall structure.   |                              |                          |                            |       |        |                       |            |                      |
| Certified Sub-Assemblies         | <ul style="list-style-type: none"> <li>Control Transformers: GE 575,460 Primary 120V Secondary</li> <li>Drive Fuses: Bussmann 315-800 Amps</li> <li>Main fuses: Bussmann 200-600 Amps</li> <li>Circuit Breakers: See Table 2</li> <li>Electronically Controlled Bypass (ECB) or</li> <li>Electro-Mechanical Bypass (EMB or 3MB for NEMA/UL Type 3R ) with or w/o: Common Run/Stop for Drive and Bypass, Bypass Undervoltage protection, Automatic Bypass, Run Permissive in Bypass, and/or Firemode via Bypass</li> <li>None, 2 or 3 contactor Bypass circuit</li> <li>Main Disconnect Switch , Drive Disconnect Switch and/or Main Circuit Breaker</li> <li>Brake IGBT</li> <li>Safe Stop</li> <li>RFI filter Class A1 &amp; A2</li> <li>A, B, C, D option cards</li> </ul>  |                              |                          |                            |       |        |                       |            |                      |
| Notes                            | <ol style="list-style-type: none"> <li>Includes voltages of 380-690VAC 3 phase</li> <li>See Figure 1: Traditional Panel (P650) Tier Visual Identification</li> <li>Identification: Type Codes (T/C) are alphanumeric sequences which uniquely identifies the configuration of the unit. In the Table above, "*" indicates a variable defined as follows: <ul style="list-style-type: none"> <li>Certified drive Type Codes are listed in Figure 2.</li> <li>Certified panel Type Codes are listed in Figure 3.</li> </ul> </li> <li>Basis: <ul style="list-style-type: none"> <li>UUT#: Indicates that a test specimen matching these characteristics was tested.</li> <li>INT (Interpolate): indicates a model that was not specifically tested, and by which seismic qualification was established through evaluation of testing of other, similar models in the product line.</li> </ul> </li> </ol> |                              |                          |                            |       |        |                       |            |                      |

**ATTACHMENT 1: SEISMIC CERTIFIED COMPONENTS**

ATTACHMENT PAGE | 2 OF 5



**FIGURE 1: CLASSIC PANEL TIER VISUAL IDENTIFICATION**

**TABLE 2: TRANE TR200 DRIVE CIRCUIT BREAKERS**

| Drive Manufacturer P/N | Amp Rating |
|------------------------|------------|
| 34057800               | 250        |
| 34057900               | 400        |
| 34058000               | 600        |
| 34059900               | 800        |
| 177G5088               | 320        |
| 177G5089               | 400        |
| 177G5090               | 480        |
| 177G5091               | 600        |
| 177G5092               | 800        |





**ATTACHMENT 1: SEISMIC CERTIFIED COMPONENTS**

| Character | Parameter                   | Allowed Value | Description                  |
|-----------|-----------------------------|---------------|------------------------------|
| 34        | Options A                   | X             | No Option                    |
|           |                             | 4             | DeviceNet MCA 104            |
|           |                             | J             | BACNet MCA 109               |
|           |                             | Q             | Modbus TCP                   |
|           |                             | G             | Lon Works MCA 108            |
|           |                             | L             | Profinet MCA 120             |
|           |                             | N             | Ethernet/IP MCA 121          |
|           |                             | 0             | Profibus DP V1               |
|           |                             | Q             | Modbus MCA 122               |
|           |                             | T             | 3000 Converter (FC302only)   |
|           |                             | U             | 5000 Converter (FC302only)   |
|           |                             | 6             | CanOpen (FC302 only))        |
|           |                             | 8             | EtherCAT (FC302 only)        |
|           |                             | 35            | Options B                    |
| 0         | Analog I/O MCB 109          |               |                              |
| 2         | PTC Thermistor Card         |               |                              |
| 4         | Sensor Input Card           |               |                              |
| K         | General Purpose I/O MCB 101 |               |                              |
| P         | Relay Card MCB 105          |               |                              |
| R         | CL Encoder                  |               |                              |
| U         | CL Resolver                 |               |                              |
| Y         | Extended Cascade Control    |               |                              |
| Z         | Safety PLC Interface        |               |                              |
| 36        | Options C1                  | X             | No Selection                 |
|           |                             | 4             | SyncPos                      |
|           |                             | 5             | Advanced Control             |
| 37        | Options C2                  | X             | No Selection                 |
|           |                             | R             | Extended Relay Card          |
| 38-39     | Options C3                  | XX            | No software option           |
|           |                             | 10            | Synchro. Control             |
|           |                             | 11            | Positioning Control          |
| 40        | Options D                   | 12            | Center Winder                |
|           |                             | X             | No option                    |
|           |                             | 0             | Interface for 24V dc MCB 107 |

**ATTACHMENT 2: TEST SPECIMEN SUMMARY**

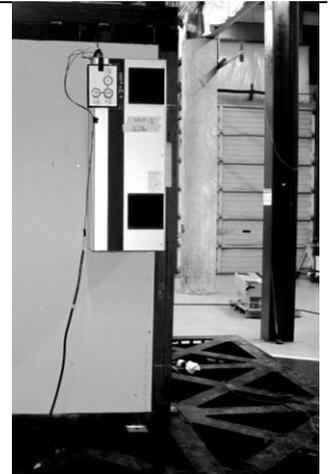
**TABLE 1: SHAKE TABLE TEST PARAMETERS**

| BUILDING CODE       | TEST CRITERIA   | S <sub>DS</sub> | z/h | I <sub>P</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|---------------------|-----------------|-----------------|-----|----------------|--------------------|--------------------|--------------------|--------------------|
| IBC 2012 / CBC 2013 | ICC-ES AC156-10 | 2.6             | 1.0 | 1.5            | 4.16               | 3.12               | 1.74               | 0.70               |

All test specimens below maintained structural integrity and functionality at the conclusion of all testing.

**UUT-1: D1h FRAME DRIVE**

|                       |   |  |
|-----------------------|---|--|
| <i>Description:</i>   | 132 kW / 200 HP<br>Three-phase 380-600 VAC<br>IP 21 /Type 1 enclosure<br>RFI Class A1<br>No Brake IGBT<br>Graphical Local Control Panel | Coated PCB<br>Fuses<br>Standard Cable Entries<br>Option Card :<br>-MCA 121 Ethernet IP<br>-MCB 101 General Purpose I/O<br>-MCO 351 Positioning control |
| <i>Mounting:</i>      | Wall mounted w/ (4) - 1/4" self-tapping screws w/ 1 - 1/4" OD fender washers  |  |
| <i>Dimensions:</i>    | W (in.)      D (in.)      H (in.)   |  |
|                       | 12.8            14.5            33.2  |  |
| <i>Weight:</i>        | 161 lbs.  |  |
| <i>Resonance</i>      | X-Axis      Y-Axis      Z-Axis  |  |
| <i>Frequencies:</i>   | ---            ---            ---   |  |
| <i>Identification</i> | P/N: 134H0949   |  |



**UUT-2: D6h FRAME DRIVE**

|                       |   |   |
|-----------------------|---|---|
| <i>Description:</i>   | 132 kW / 200 HP<br>Three-phase 525-690 VAC<br>IP 54 /Type 12 enclosure<br>RFI Class A2<br>Brake IGBT<br>Graphical Local Control Panel<br>Heater | Coated PCB<br>Mains Disconnect, contactor and fuse<br>Standard Cable Entries<br>Option Card :<br>-MCA 121 Ethernet IP<br>-MCB 101 General Purpose I/O<br>-MCO 351 Positioning control |
| <i>Mounting:</i>      | Wall mounted w/ (4) - 1/4" self-tapping screws w/ 1 - 1/4" OD fender washers  |   |
| <i>Dimensions:</i>    | W (in.)      D (in.)      H (in.)   |   |
|                       | 12.8            14.625            63.6  |   |
| <i>Weight:</i>        | 286.5 lbs.  |   |
| <i>Resonance</i>      | X-Axis      Y-Axis      Z-Axis  |   |
| <i>Frequencies:</i>   | ---            ---            ---   |   |
| <i>Identification</i> | P/N:134H0931  |   |



**UUT-3: D2h FRAME TIER 3 PANEL**

|                       |   |   |
|-----------------------|---|---|
| <i>Description:</i>   | 250 kW / 350 HP<br>Three-phase 380-480 VAC<br>IP 54 /Type 12 enclosure (Drive)<br>Type 1 enclosure (Panel)<br>RFI Class A2<br>No Brake IGBT<br>Graphical Local Control Panel<br>Line Reactor<br>Output dV/dt Filter | Coated PCB<br>Fuses<br>Standard Cable Entries<br>2 Contactor Bypass<br>Main Circuit Breaker<br>Drive Disconnect Switch<br>Drive Fusing<br>EMB 2 Package<br>Standard RFI |
| <i>Mounting:</i>      | Wall mounted using (16) - 1/4" self-tapping screws w/ 1 - 1/4" OD Fender washers  |   |
| <i>Dimensions:</i>    | W (in.)      D (in.)      H (in.)   |   |
|                       | 49.7            14.6            61.125  |   |
| <i>Weight:</i>        | 1070 lbs.   |   |
| <i>Resonance</i>      | X-Axis      Y-Axis      Z-Axis  |   |
| <i>Frequencies:</i>   | ---            ---            ---   |   |
| <i>Identification</i> | P/N: 131Z8887   |   |



**ATTACHMENT 2: TEST SPECIMEN SUMMARY**

**UUT-4: D1h FRAME DRIVE**

|                        |  |  |
|------------------------|--|--|
| <i>Description:</i>    | 132 kW / 200 HP<br>Three-phase 525-690 VAC<br>IP 21 /Type 1 enclosure<br>RFI Class A2<br>No Brake IGBT<br>Graphical Local Control Panel<br>Pedestal base | Coated PCB<br>Fuses<br>Standard Cable Entries<br>Option Card :<br>-MCA 121 Ethernet IP<br>-MCB 101 General Purpose I/O<br>-MCO 351 Positioning control |
| <i>Mounting:</i>       | Rigid Base (Floor) Mounted using (4) ½" Grade 5 Allen Head Cap Screws w/ washers   |  |
| <i>Dimensions:</i>     | W (in.)      D (in.)      H (in.)  |  |
|                        | 12.8            14.5            48.9   |  |
| <i>Weight:</i>         | 142 lbs.   |  |
| <i>Resonance</i>       | X-Axis      Y-Axis      Z-Axis   |  |
| <i>Frequencies:</i>    | 15.6        15.4        12.8   |  |
| <i>Identification:</i> | P/N:134H0952   |  |



**UUT-5: D1h FRAME DRIVE**

|                        |   |  |
|------------------------|---|--|
| <i>Description:</i>    | 132 kW / 200 HP<br>Three-phase 525-690 VAC<br>IP 54 /Type 12 enclosure<br>RFI Class A2<br>Brake IGBT<br>Graphical Local Control Pane<br>Pedestal Base | Coated PCB<br>Fuses<br>Standard Cable Entries<br>Option Card :<br>-MCA 121 Ethernet IP<br>-MCB 101 General Purpose I/O<br>-MCO 351 Positioning control |
| <i>Mounting:</i>       | Wall/Floor mounted using (4) - 3/8 " Bolts to the floor and (4) - ¼" self-tapping screws at top anchor point.   |  |
| <i>Dimensions:</i>     | W (in.)      D (in.)      H (in.)   |  |
|                        | 12.75        14.5        48.875   |  |
| <i>Weight:</i>         | 142 lbs.  |  |
| <i>Resonance</i>       | X-Axis      Y-Axis      Z-Axis  |  |
| <i>Frequencies:</i>    | ---            ---            ---   |  |
| <i>Identification:</i> | P/N:134H0950  |  |



**UUT-6: D8h FRAME DRIVE**

|                        |   |   |
|------------------------|---|---|
| <i>Description:</i>    | 250 kW / 350 HP<br>Three-phase 380-500 VAC<br>IP 54 /Type 12 enclosure<br>RFI Class A1<br>Brake IGBT<br>Graphical Local Control Panel<br>Heater | Coated PCB<br>Mains Disconnect, contactor and fuse<br>Standard Cable Entries<br>Option Card :<br>-MCA 121 Ethernet IP<br>-MCB 101 General Purpose I/O<br>-MCO 351 Positioning control |
| <i>Mounting:</i>       | Wall/Floor mounted using (4) - 3/8" gr 8 bolts to floor plate and (2) - ¼" self-tapping screws at top anchor point.                             |   |
| <i>Dimensions:</i>     | W (in.)      D (in.)      H (in.)   |   |
|                        | 16.6            14.625        80.25   |   |
| <i>Weight:</i>         | 540 lbs.  |   |
| <i>Resonance</i>       | X-Axis      Y-Axis      Z-Axis  |   |
| <i>Frequencies:</i>    | ---            ---            ---   |   |
| <i>Identification:</i> | P/N: 134H0930   |   |

