**Eaton Type CH Convertible Family**

## Contents



# Overview

## Product Selection Guide

### CH Loadcenters

| Description | |
|---|---|
| **Service** | |
| Single-phase, three-wire, 120/240 Vac | Three-phase, four-wire, 208Y/120 Vac |
| Three-phase, three-wire, 240 V corner grounded delta | Three-phase, three-wire, 240 Vac delta |
| **Short-Circuit Current Rating** | |
| 10 kAIC: All single- and three-phase loadcenters 40–400 A, 2–42 circuits except when series ratings are applied | 35 kAIC available on convertible units using CSH main breaker |
| 25 kAIC: All factory-installed main breakers single-phase loadcenters rated 150–225 A using Type CSR main breakers | 42 and 100 kAIC are available on some styles: single-phase and three-phase |
| **Main Breaker/Main Lug Loadcenters** | |
| Single-phase | Three-phase |
| Main breaker: 100, 125, 150, 200, 225, 400 A | Main breaker: 150, 200, 225, 300, 400 A |
| Main lugs: 40, 70, 125, 150, 200, 225, 400 A | Main lugs: 125, 150, 200, 225, 400 A |
| **Convertible Loadcenters** | |
| Main breaker or main lugs: single-phase up to 225 A | |
| **Branch Breakers** | |
| Type CH: 10–150 A. Single-, two- and three-pole. Selected amperages available in shunt trip, HACR and switching duty | Type CH-AFCI arc fault circuit interrupter |
| Ground fault circuit interruptors: 15–60 A | Type CHP: 10–125 A. Single-, two- and three-pole. three-position commercial trip |
| Type CH-HID: 15–30 A. Single-, two- and three-pole | Selected amperages available in HACR switching duty |
| CH-HM high magnetic | Type CHP-HID: 15–30 A. Single-, two- and three-pole |
| CH-M50 high ambient | Type CHP-GFCI: 15–30 A. Single-pole ground fault breakers |
| **Enclosures** | |
| NEMA® Type 1 indoor | NEMA Type 3R outdoor |
| **Loadcenter and Breaker Accessories** | |
| Branch circuit breaker: | Complete line of ground bar kits 5, 10, 14 and 21 circuits, some with additional #2/0 lugs |
| Auxiliary components | Each terminal will accommodate: (3) #14–#10 Cu/Al or (1) #14–#4 Cu/Al |
| Hold-down kits | Sub-feed lugs 125, 150 A—two- and three-pole |
| Handle ties | Shunt trips |
| Lockoffs | Universal rainproof conduit hubs Group One: 3/4, 1, 1-1/4, 1-1/2, 2 inches (19.1, 25.4, 31.8, 38.1, 50.8 mm) |
| Lockdogs | Group Two: 2, 2-1/2, 3 inches (50.8, 63.5, 76.2 mm) |
| | Adapter plate |
| **Bussing** | |
| Silver flash plated copper bus is a standard feature | |

## Product Description

Loadcenters are enclosures specifically designed to house the branch circuit breakers and wiring required to distribute power to individual circuits. They contain either a main breaker when used at the service entrance point or a main lug when used as a sub-panel to add circuits to existing service. The main breaker protects the main entire panel and can be used as a service disconnect. The branch breakers protect the wires leading to individual electrical loads such as fixtures and outlets.

## Features, Benefits and Functions

### *Loadcenter Construction*

Eaton's Type CH loadcenters feature silver flash plated copper bus in all interiors. Stabs are rated 200 A throughout the CH line. Therefore, the sum of the handle ratings connected to any one stab is limited to 200 A maximum. NEMA 1 boxes are manufactured from cold rolled 16 gauge sheet steel. Raintight boxes are manufactured from galvanized steel. All boxes and trims are finished using an electrostatic powder coat, baked urethane paint process.

### *Neutrals*

Eaton Type CH loadcenters feature two types of neutrals:

### *Insulated/Bondable Split Neutral*

Panels are supplied with split insulated neutrals with an insulated cross strap. For service entrance applications, the neutral must be bonded by using the bonding strap supplied with the panel. For non-service entrance (sub-panel) applications, the panel may be installed with the bonding strap not connected to the neutral. Separate ground bars must be used on non-service entrance panels.

### *Insulated/Bondable Single Neutral*

Panels are supplied with a single insulated neutral. For service entrance applications, all that is required to bond the neutral is to loosen the bonding screw and the neutral screw directly beside it, insert the bonding strap into the neutral bar, and re-tighten both connections. The single neutral can be moved by the contractor to the other side of the panel, if desired. When used as a service entrance panel, unused neutral connections may be used for the termination of equipment grounds. For non-service entrance (sub-panel) applications, the panel may be installed with the bonding strap not connected to the neutral. Separate ground bars must be used on non-service entrance panels.

### *Inboard Plug-On Neutral*

Code changes and higher safety standards are leading to more arc fault circuit interrupter (AFCI) installations. With the electrical contractor in mind, Eaton has revolutionized the way Combination AFCIs are installed with the Plug-on Neutral line of loadcenters and breakers. This unique product solution enables the contractor to connect the breaker directly to the neutral bar, eliminating the need for wiring a pigtail.

### *Grounds*

In service entrance applications where the neutral is bonded, unused neutral holes may be used for terminating ground conductors. In sub-feed panels, the neutral must be isolated (non-bonded), and ground wires must be terminated on a separate ground bar.

The insulated/bondable single/split neutral panels have sufficient terminations for both ground and neutral conductors. The insulated/bondable single split neutral panels are supplied with a separate factory-installed ground bar if the catalog number contains a "G." If not, a separate ground bar should be installed. Insulated/Bondable Single Neutral panels are supplied without a ground bar (unless otherwise noted), and ground bar kits, if needed, must be purchased separately.

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## Standards and Certifications

### *UL® Listings*

All Eaton Type CH loadcenters are listed under UL File E8741.

### *Neutral and Ground Terminals*

The standard terminals on grounds and neutrals are rated to accept (3)—#14–#10 Cu/Al or (1)—#14–4 wires. For larger cables, add-on neutral lugs may be ordered from the Accessories.

**Note:** NEC® allows only one current carrying conductor per hole on neutrals unless otherwise noted.

### *Bottom-Fed Loadcenters*

When the power cable is brought into the loadcenter from below the panel; then the main lug panels, and single-phase, 225 A and below, loadcenters can be rotated 180 degrees to allow straight-in wiring of power cables to the main terminals. Because the CSR main circuit breaker handle operates horizontally, the orientation of the main circuit breaker handle is consistent with the requirements of NEC Article 240.81.

### *Gutter Splicing*

Loadcenters are not UL listed as wiring troughs. Therefore, gutter splicing of riser cables to tap off to the main device is not permitted. Refer to NEC Article 373.8.

### *Fire Rating*

Due to the numerous openings in both loadcenter boxes and trims, they should not be mounted in firewalls. There is no approval method for sealing the enclosures for this application.

### *Date Code*

The date of manufacture of each loadcenter is printed on the outside of the carton as well as inside the loadcenter. On the carton, the date code is printed on the end carton label. In the loadcenter, the date code is located on the small white label located on the right side wall (with the main device on top).

The date code is in the following format: F # # # &. The "F" is the numeric code for the Lincoln, IL plant, and the three numbers are the year and week of manufacture, e.g., 023. The "&" sign at the end signifies the decade of the 2000s. The "!" at the end signifies the decade of the 2010s. Therefore, the date code F023& would indicate that the product was manufactured in the 23rd week of 2000. The 1980s are represented by a "+" sign and the 1990s are represented by a "=" at the end of the code.

### *Plug-On Type CH Breakers*

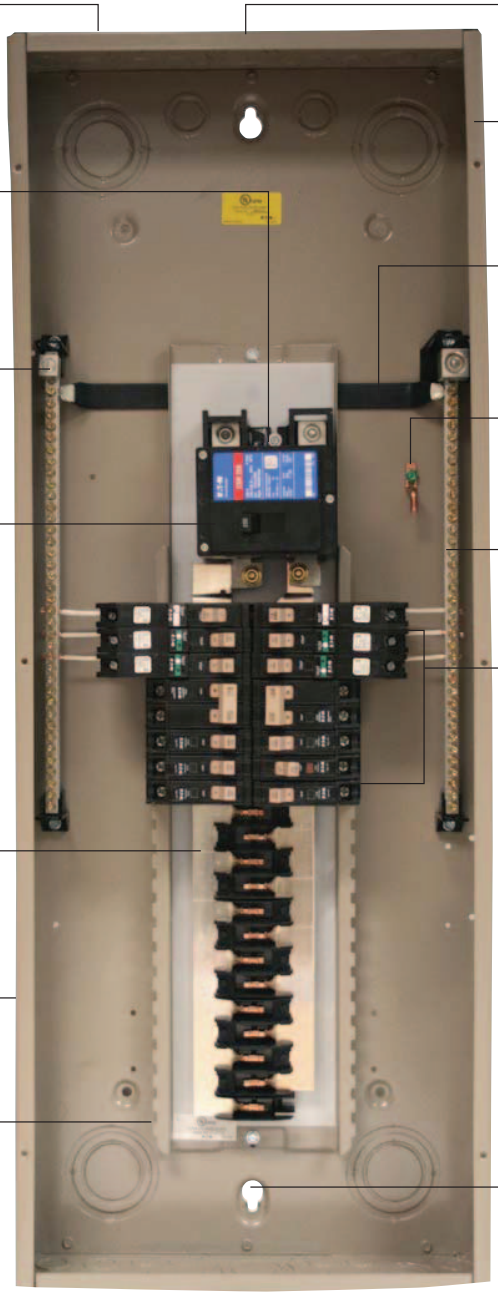
Quick-make, quick-break switch mechanism combined with inverse time element tripping operation and trip-free handle design. Type CH circuit breakers trip to the OFF position eliminating nuisance callbacks. The thermal-magnetic trip curve avoids nuisance tripping on mild overloads while reacting almost instantaneously to severe short-circuit conditions. CHF breakers include a 'trip flag' to differentiate between a tripped breaker and one that has been turned off. Multipole breakers have internal common trip connection to operate all poles simultaneously. Handles are marked with ON-OFF indication and ampere rating of the breaker. Type CH breakers meet UL Standard 489, NEMA standards, and Federal Spec Classification W-C 375 b/Gen. They are UL listed under File Number E11713, E8741, E3624 and E51287: and CSA® certified file number LR87196, except Type CHT breakers.

### *Type CH Circuit Breaker Ratings*

Single- and double-pole CH breakers rated 15 and 20 A have low instantaneous magnetic trip levels. The 15 and 20 A breakers with "HM" suffix have high magnetic trip settings recommended for circuits with inherently high inrush currents. All Type CH breakers are marked for heating, air conditioning and refrigeration (HACR) equipment application. Single-pole 15–20 A breakers are also suitable for switching duty (SWD). Shunt trip coils operate on 120 Vac and require one additional pole space per breaker.

UL® Listed

## Type CH Loadcenter



Extra 1.5 inch Knockout (38.1 mm)
- Larger knockout provides easier installation and time savings for renovation installations

Top or Bottom Feed
- Straight-in wiring saves labor and material
- One panel for either top or bottom applications

2/0 Lug
- Easily removable and can be installed in any location on the neutral bar

Commercial Grade Main Breaker
- 25 kAIC series rated main breaker in 150 A–225 A load-centers. 35, 42 and 100 kAIC series ratings are available
- Optional convertible design—reduces inventory requirements

One Piece Silver-Flashed Copper Bus
- Provides superior conductivity, corrosion resistance and durability

Drywall Marking on Enclosure
- Indicates proper mounting depth for flush applications

Steel Backpan
- Provides solid and reliable breaker mounting—single piece design for stability and durability

"Tangential" Center Knockout
- Easier installation for conduit applications

Unique Sandalwood Finish
- Aesthetically appealing, scratch-resistant powder coating

Neutral Bus (Strap)
- Easily removable for sub-panel applications

Bonding Z-Strap
- Provides easy field conversion for service entrance applications

Twin Neutral Bars
- Minimum 150% neutral capacity

Type CHF AFCI/GFCI/Thermal-Magnetic Breakers
- Advanced electronics effectively reduce nuisance tripping
- CHF AFCI breakers have a standard diagnostic LED indicating 1 of 7 trip codes
- Mechanical flag for trip indication (on thermal-magnetic AFCI and GFCI)
- All CH breakers provide industry exclusive 2-position handle with simple 1 step reset

Single Keyhole Mounting
- One keyhole at the top and bottom provides easier mounting and leveling

***Warranty***

The minimum warranty for residential loadcenters, breakers and surge protection devices shall be as follows:

- Lifetime loadcenter warranty
- Lifetime warranty on CH circuit breakers
- Lifetime warranty on CHSPT2ULTRA including $75,000 connected equipment warranty
- 1-year warranty on plug-in surge protective device (CHSA)

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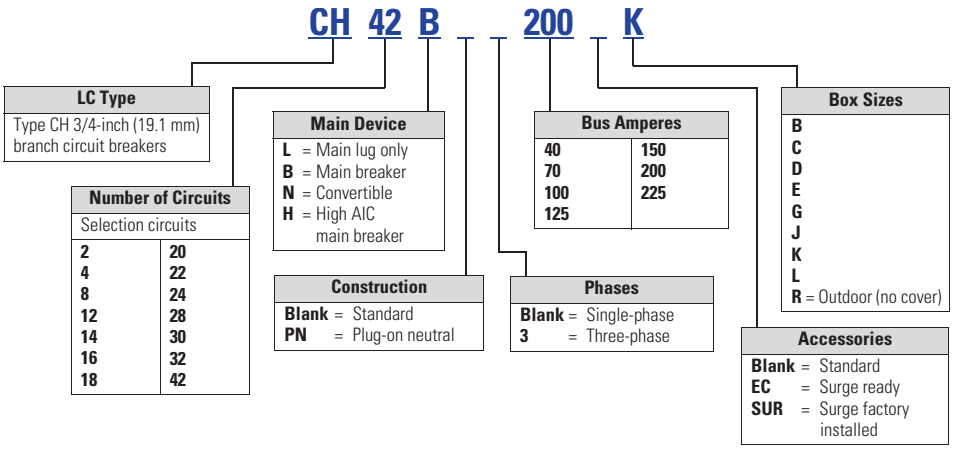
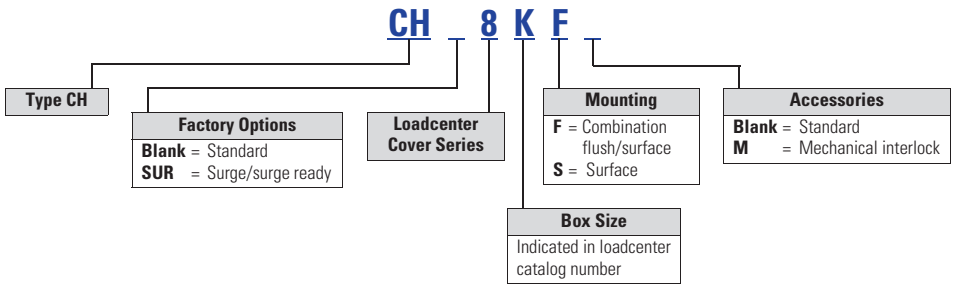
## Catalog Number Selection

### Loadcenters 100–225 A and 12–42 Circuits




### Indoor Covers Ordered Separately




**Note:** All combinations are not valid, refer to the catalog section.

***Single-Phase—Main Lug Loadcenters***

## Single-Phase Three-Wire—120/240 Vac—Insulated/Bondable Single Neutral

| | Main Ampere Rating | Maximum Number 3/4-Inch (19.1 mm) Space | Poles | Enclosure Type | Type of Trim (Included) | Box Size | Wire Size Range Cu/Al 60 °C or 75 °C for Main Lugs | Loadcenter Catalog Number |
|---|---|---|---|---|---|---|---|---|
| **Surface Outdoor**  | 40 | 2 | 4 ① | Indoor | Surface (no door) | 5 | #14–6 | **CH2L40SP** ②③ |
| | | 2 | 4 ① | Outdoor | — | 5R | #14–6 | **CH2L40RP** ②③④ |
| | | 2 | 4 ① | Indoor | Flush (no door) | 5 | #14–6 | **CH2L40FP** ②③ |
| **Flush Outdoor**  | 70 | 2 | 4 ① | Indoor | Surface (no door) | 5 | #14–2 | **CH2L70SP** ②③ |
| | | 2 | 4 ① | Outdoor | — | 5R | #14–2 | **CH2L70RP** ②③④ |
| | | 2 | 4 ① | Indoor | Flush (no door) | 5 | #14–2 | **CH2L70FP** ②③ |
| **Surface (No Door)**  | 125 | 2 | 4 ① | Indoor | Surface (no door) | 6 | #14–1/0 | **CH2L125SP** ②③ |
| | | 2 | 4 ① | Outdoor | — | 6R | #14–1/0 | **CH2L125RP** ②③④ |
| | | 2 | 2 | Outdoor | — | — | #14–1/0 | **CH2L125RSE2P** ④⑤⑥ |
| | | 2 | 4 ① | Indoor | Flush (no door) | 6 | #14–1/0 | **CH2L125FP** ②③ |
| | | 4 | 8 ① | Indoor | Surface (no door) | 7 | #14–1/0 | **CH4L125SP** ②⑦ |
| | | 4 | 8 ① | Outdoor | — | 7R | #14–1/0 | **CH4L125RP** ②④⑦ |
| **Flush (No Door)**  | | 4 | 8 ① | Indoor | Flush (no door) | 7 | #14–1/0 | **CH4L125FP** ②⑦ |
| | | 6 | 12 ① | Outdoor | — | 6R | #14–1/0 | **CH6L125R** ②⑥⑦ |
| | | 8 | 16 ① | Indoor | Surface (no door) | 7 | #6–1/0 | **CH8L125SP** ②⑧ |
| | | 8 | 16 ① | Outdoor | — | 7R | #6–1/0 | **CH8L125RP** ②⑥⑦ |
| **Outdoor**  | | 8 | 16 ① | Indoor | Flush (no door) | 7 | #6–1/0 | **CH8L125FP** ②⑧ |

***Notes***

① Requires the use of Type CHT breakers.

② Ground bar kits priced separately, see **Page V1-T1-25**.
– For 2/4 and 6/12 circuit loadcenters, use Type GBK5 or GBK520 ground bar
– For 4/8 and 8/16 circuit loadcenters, use Type GBK10 ground bar
– Ground bars mount to the left side wall of the enclosure for the 4/8, 6/12 and 8/16 circuit loadcenters

③ Suitable for use as service equipment when not more than two service disconnecting mains are provided or when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).

④ Rainproof panels are furnished with hub closure plates. For rainproof hubs, refer to **Page V1-T1-25**.

⑤ For use as service entrance applications only.

⑥ Neutral/ground holes (6) #14–6 and (3) #14–2/0 AWG Cu/Al.

⑦ Suitable for use as service equipment when not more than two service disconnecting mains are provided or when not more than six service disconnecting mains are provided and when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).

⑧ Suitable for use as service equipment when a main breaker is used or when not more than six service disconnecting mains are provided and when not used as a lighting and appliance panelboard (see Article 408.34 of the NEC).

Box sizes **Pages V1-T1-27** and **V1-T1-28**.

## Dimensions

Approximate Dimensions in Inches (mm)

***Residential/Commercial/Unit Enclosure—Box Sizes***

**Note:** Box sizes do not include covers/fronts.

### Residential Loadcenters

| Box Size | Height | Width | Depth |
|---|---|---|---|
| **NEMA Type 1 Indoor** | | | |
| 5 | 9.50 (241.3) | 4.50 (114.3) | 3.13 (79.4) |
| 6 | 11.38 (288.9) | 6.88 (174.6) | 3.39 (86.1) |
| 7 | 13.00 (330.2) | 11.00 (279.4) | 3.69 (93.7) |
| B | 16.75 (425.5) | 14.31 (363.5) | 3.88 (98.4) |
| C | 21.00 (533.4) | 14.31 (363.5) | 3.88 (98.4) |
| D | 29.13 (739.8) | 14.31 (363.5) | 3.88 (98.4) |
| E | 29.13 (739.8) | 14.31 (363.5) | 3.88 (98.4) |
| G | 34.13 (866.8) | 14.31 (363.5) | 3.88 (98.4) |
| J | 34.13 (866.8) | 14.31 (363.5) | 3.88 (98.4) |
| K | 37.00 (939.8) | 14.31 (363.5) | 3.88 (98.4) |
| L | 39.00 (990.6) | 14.31 (363.5) | 3.88 (98.4) |
| N | 45.00 (1143.0) | 14.31 (363.5) | 3.88 (98.4) |
| **NEMA Type 3R Outdoor** | | | |
| 5R | 9.50 (241.3) | 4.50 (114.3) | 3.13 (79.4) |
| 6R | 11.75 (298.5) | 6.50 (165.1) | 4.50 (114.3) |
| 7R | 13.00 (330.2) | 11.00 (279.4) | 3.69 (93.7) |
| B | 16.75 (425.5) | 14.31 (363.5) | 5.19 (131.8) |
| C | 21.00 (533.4) | 14.31 (363.5) | 5.19 (131.8) |
| D | 29.13 (739.8) | 14.31 (363.5) | 5.19 (131.8) |
| E | 29.13 (739.8) | 14.31 (363.5) | 5.19 (131.8) |
| G | 34.13 (866.8) | 14.31 (363.5) | 5.19 (131.8) |
| J | 34.13 (866.8) | 14.31 (363.5) | 5.19 (131.8) |
| K | 37.00 (939.8) | 14.31 (363.5) | 5.19 (131.8) |
| L | 39.00 (990.6) | 14.31 (363.5) | 5.19 (131.8) |

### Commercial Loadcenters

| Box Size | Height | Width | Depth |
|---|---|---|---|
| **NEMA Type 1 Indoor** | | | |
| P | 54.38 (1381.1) | 21.00 (533.4) | 6.00 (152.4) |
| PM | 62.63 (1590.7) | 21.00 (533.4) | 6.00 (152.4) |

### Types ECB and ECC Unit Enclosures

| Height | Width | Depth |
|---|---|---|
| **NEMA Type 1 Indoor** | | |
| 23.25 (590.6) | 8.88 (225.4) | 4.50 (114.3) |
| **NEMA Type 3R Outdoor** | | |
| 23.69 (601.7) | 9.31 (236.5) | 5.44 (138.1) |

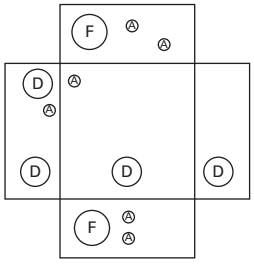
***Residential Loadcenter Knockout***

Residential NEMA Type 1 Indoor and NEMA Type 3R Outdoor Enclosures.

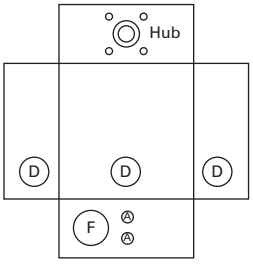
### Knockouts for Box Sizes 5, 6, 7, 5R, 6R, 7R

| Code | Diameter | | | |
|---|---|---|---|---|
| A | 0.50 (12.7) | — | — | — |
| B | 0.50 (12.7) | 0.75 (19.1) | — | — |
| C | 0.50 (12.7) | 0.75 (19.1) | 1.00 (25.4) | — |
| D | 0.50 (12.7) | 0.75 (19.1) | 1.00 (25.4) | 1.25 (31.8) |
| E | 0.75 (19.1) | 1.00 (25.4) | 1.25 (31.8) | — |
| F | 0.75 (19.1) | 1.00 (25.4) | 1.25 (31.8) | 1.50 (38.1) |
| G | 1.00 (25.4) | 1.25 (31.8) | 1.50 (38.1) | — |
| H | 1.00 (25.4) | 1.25 (31.8) | 1.50 (38.1) | 2.00 (50.8) |
| I | 1.25 (31.8) | 1.50 (38.1) | 2.00 (50.8) | — |

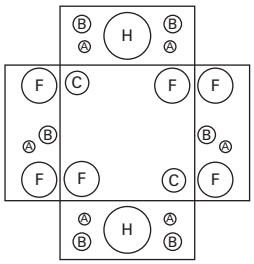
### Knockout Positions




*Box 5*




*Box 5R*

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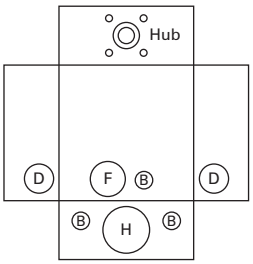
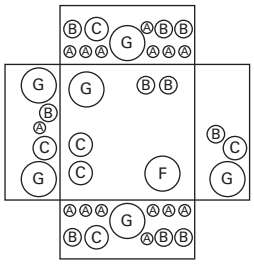
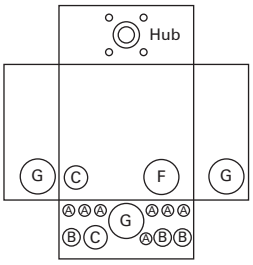



*Box 6R*




*Box 7*




*Box 7R*