

# T-1 3/4 Sub-Miniature LED Replacement Lamp



Direct incandescent replacement LED lamp that delivers improved illumination, durability and long life. The T-1 3/4 Sub-Miniature LED lamps are drop in replacements for the less efficient filament lamps, typically used within pushbutton switches and indicators.



## Key Features

- T-1 3/4 sub-miniature LED lamp (light bulb)
- Voltage: 2-28 VDC
- Base: bi-pin, bayonet, flange, groove, screw, wedge
- Available in six LED single colors: red, amber, green, orange, blue, white
- Available in one bi-color: red/green
- Low power consumption
- Mounts directly into industry standard sockets
- Single chip based LED
- Direct incandescent replacement
- Low power consumption - uses up to 90% less energy than an incandescent lamp
- Low heat generation, LEDs operate significantly cooler than traditional lamps
- Designed for quick installation and reduces overall cost due to less-frequent replacements
- Fast on/off cycling, shock resistance, and long operating life
- Compliant with RoHS and REACH

| 1 Model <sup>[1]</sup> |         |
|------------------------|---------|
| BP202 <sup>[5]</sup>   | Bi-Pin  |
| MB200                  | Bayonet |
| MF200 <sup>[6]</sup>   | Flange  |
| MG200                  | Groove  |
| MS200                  | Screw   |
| WB201                  | Wedge   |

**TO ORDER, FOLLOW THE EXAMPLE:**

Select one **BOLD** component from each SHADED column in the tables below.

| 1 Model      | 2 LED | 3 Voltage |
|--------------|-------|-----------|
| <b>WB201</b> | -BCG  | 12H       |

→Part Number **WB201-BCG12H**

| 2 MEDIUM INTENSITY - TINTED ENCAPSULATION |       |          |                         |               |                          |
|---|-------|----------|-------------------------|---------------|--------------------------|
| LED                                       | Color | λpk (nm) | Iv <sup>[2]</sup> (mcd) | Viewing Angle | V/C Table <sup>[3]</sup> |
| -BCR                                      | RED   | 635      | 120                     | 35            | I                        |
| -BCA                                      | AMB   | 583      | 100                     | 35            | I                        |
| -BCG                                      | GRN   | 565      | 80                      | 24            | I                        |

| Voltage/Current    |            |
|--------------------|------------|
| Design Vf/If       | Max Vf/If  |
| <b>V/C Table I</b> |            |
| 5V/22mA            | 5.5V/28mA  |
| 6V/21mA            | 7V/27mA    |
| 12V/20mA           | 14V/25mA   |
| 15V/24mA           | 16.5V/28mA |
| 24V/17mA           | 26V/20mA   |
| 28V/16.5mA         | 30V/18mA   |

| 3 Voltage <sup>[4]</sup> |
|--------------------------|
| 2                        |
| 5H                       |
| 6H                       |
| 12H                      |
| 15H                      |
| 24H                      |
| 28H                      |
| 120                      |

| HIGH INTENSITY- WATERCLEAR ENCAPSULATION |       |          |                         |               |                          |
|--|-------|----------|-------------------------|---------------|--------------------------|
| LED                                      | Color | λpk (nm) | Iv <sup>[2]</sup> (mcd) | Viewing Angle | V/C Table <sup>[3]</sup> |
| -NWR                                     | RED   | 634      | 2800                    | 30            | I                        |
| -NWO                                     | ORG   | 605      | 2000                    | 30            | I                        |
| -NWA                                     | AMB   | 592      | 2800                    | 30            | I                        |
| -NWG                                     | GRN   | 520      | 2400                    | 45            | II                       |
| -NWB                                     | BLU   | 465      | 700                     | 45            | II                       |
| -NWW                                     | CWHT  |          | 2500                    | 50            | II                       |
| -NWL                                     | WWHT  |          | 1800                    | 50            | II                       |
| -NKR                                     | RED   | 634      | 3600                    | 15            | I                        |
| -NKO                                     | ORG   | 605      | 8000                    | 15            | I                        |
| -NKA                                     | AMB   | 592      | 3600                    | 15            | I                        |
| -NKG                                     | GRN   | 520      | 10000                   | 15            | II                       |
| -NKB                                     | BLU   | 465      | 3000                    | 15            | II                       |
| -NKW                                     | CWHT  |          | 9200                    | 20            | II                       |
| -NKL                                     | WWHT  |          | 9200                    | 15            | II                       |

| Voltage/Current     |            |
|---------------------|------------|
| Design Vf/If        | Max Vf/If  |
| <b>V/C Table II</b> |            |
| 5V/15mA             | 5.5V/23mA  |
| 6V/15mA             | 7V/25mA    |
| 12V/15mA            | 14V/20mA   |
| 15V/15mA            | 16.5V/18mA |
| 24V/15mA            | 26V/18mA   |
| 28V/15mA            | 30V/17mA   |

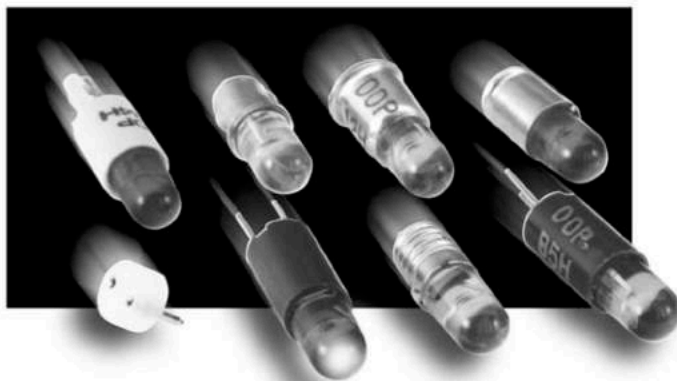
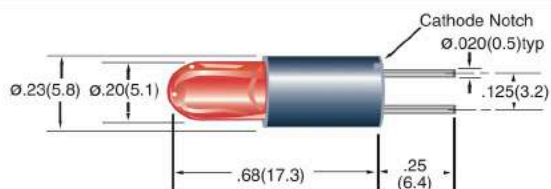
| WIDE ANGLE/FLAT-TOPPED-WATERCLEAR ENCAPSULATION |       |          |                         |               |                          |
|---|-------|----------|-------------------------|---------------|--------------------------|
| LED   | Color | λpk (nm) | Iv <sup>[2]</sup> (mcd) | Viewing Angle | V/C Table <sup>[3]</sup> |
| -NFR  | RED   | 634      | 780                     | 75            | I                        |
| -NFA  | AMB   | 592      | 600                     | 75            | I                        |
| -NFG  | GRN   | 520      | 780                     | 75            | II                       |
| -NFB  | BLU   | 465      | 168                     | 75            | II                       |
| -NFW  | WHT   |          | 280                     | 75            | II                       |

| SPECIALTY LEDs      |         |          |                         |               |                          |                       |
|---------------------|---------|----------|-------------------------|---------------|--------------------------|-----------------------|
| LED                 | Color   | λpk (nm) | Iv <sup>[2]</sup> (mcd) | Viewing Angle | V/C Table <sup>[3]</sup> | Description           |
| -RLP <sup>[7]</sup> | RED     | 635      | 2.3                     | 50            | [3]                      | Low Power             |
| -ALP <sup>[7]</sup> | AMB     | 583      | 2.1                     | 50            | [3]                      | Low Power             |
| -GLP <sup>[7]</sup> | GRN     | 565      | 2.3                     | 50            | [3]                      | Low Power             |
| -LRG                | RED/GRN | 660/565  | 90/40                   | 60            | I                        | Bi-Color, Red Cathode |

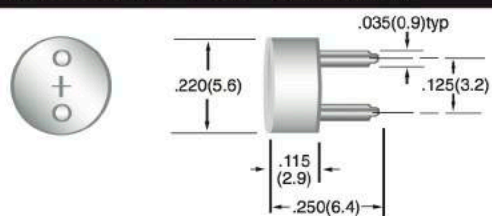
[1] All Models are center anode (note cathode notch for BP202, BP203 and WB201). Insert C after Model for center cathode (e.g. MF200C).  
 [2] Iv = typical luminous intensity @ If = 20mA (Ta=25°C). Low Power LEDs = 2mA.  
 [3] See Voltage/Current table for design specifications. Design current for low power LEDs = 2mA.  
 [4] Ta = 25°C. Voltage 2 indicates external resistor required. Voltages 5H through 28H are VDC. For AC operation, insert D after Voltage (e.g. 24HD). D indicates built-in rectifier: not required for 5H.

[5] Optional Socket available. See Model BPS-1 (pg. 72).  
 [6] Optional Socket available. See Model MFS1-B (pg. 74).  
 [7] Omit "H" Voltage designation (e.g. MG200-RLP12).

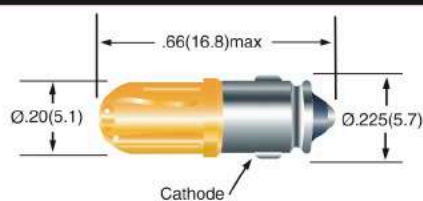
## BP202



## BPS-1 (Socket for BP202 Lamp)

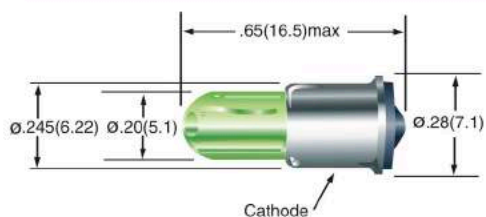


## MB200



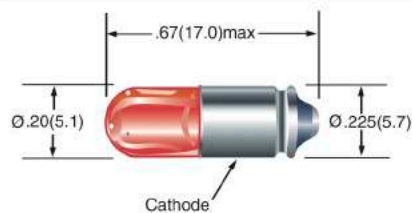
Available with Center Cathode

## MF200



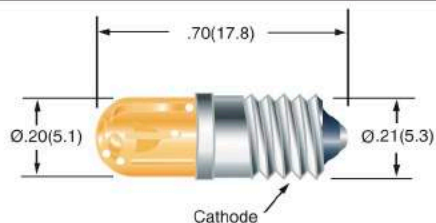
Available with Center Cathode

## MG200



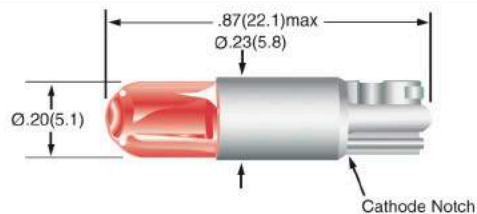
Available with Center Cathode

## MS200



Available with Center Cathode

## WB201

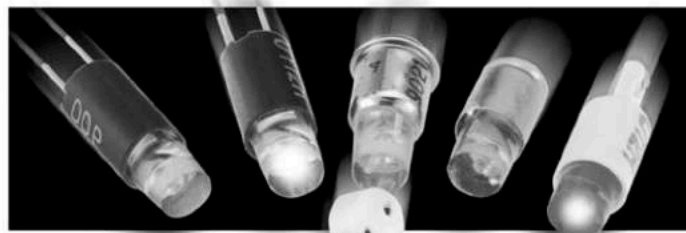
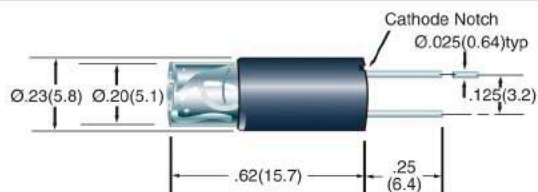


### All dimensions are in inches (mm)

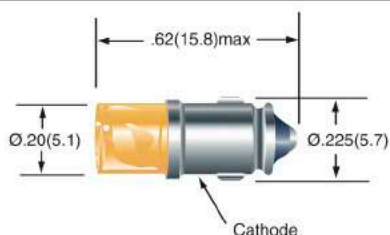
Tolerances: .xx"(.x) ±.025"(.63) / .xxx"(.xx)±.010"(.25)  
Specifications are subject to change without notice.

## Wide Angle LED Lamps

### BP202, NFX Series (75°)

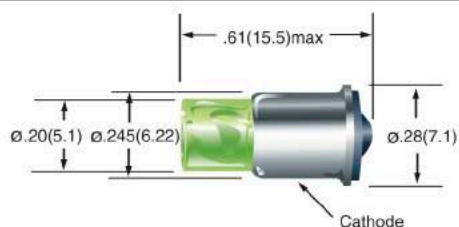


### MB200, NFX Series (75°)



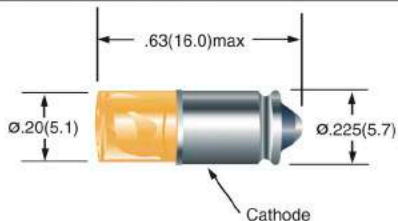
Available with Center Cathode

### MF200, NFX Series (75°)



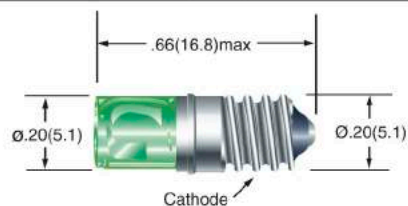
Available with Center Cathode

### MG200, NFX Series (75°)



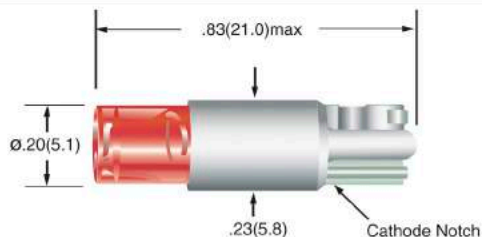
Available with Center Cathode

### MS200, NFX Series (75°)



Available with Center Cathode

### WB201, NFX Series (75°)



**All dimensions are in inches (mm)**

Tolerances: .xx"(x) ±.025"(.63) / .xxx"(xx)±.010"(.25)  
Specifications are subject to change without notice.

| Series                         | LED | Voltage | Operating Temp (°C) | Storage Temp (°C) |
|--------------------------------|-----|---------|---------------------|-------------------|
| T-1 3/4 Sub-miniature LED lamp | NFR | -       | -30 to +60          | -40 to +100       |
|                                | NFA | -       | -30 to +60          | -40 to +100       |
|                                | NFG | -       | -30 to +60          | -40 to +100       |
|                                | NFW | -       | -30 to +60          | -40 to +100       |
|                                | NFB | -       | -30 to +60          | -40 to +100       |
|                                | NWR | 24H     | -40 to +100         | -40 to +100       |
|                                | NWR | 28H     | -40 to +100         | -40 to +120       |
|                                | NWW | 24H     | -30 to +85          | -40 to +100       |
|                                | NWW | 28H     | -30 to +80          | -40 to +100       |
|                                | NWG | 24H     | -30 to +85          | -40 to +100       |
|                                | NWG | 28H     | -20 to +80          | -30 to +100       |
|                                | NWA | 24H     | -40 to +100         | -40 to +100       |
|                                | NWA | 28H     | -40 to +100         | -40 to +120       |
|                                | NWB | 24H     | -30 to +85          | -40 to +100       |
|                                | NWB | 28H     | -20 to +80          | -30 to +100       |
|                                | BCG | -       | -20 to +100         | -55 to +100       |
|                                | BCR | -       | -55 to +100         | -55 to +100       |
|                                | BCA | -       | -55 to +100         | -55 to +100       |

\* For operating temperature of a specific part number contact VCC

| Incandescent Lamp # | Design Voltage | Base Description     | VCC Model # | Suggested VCC Part Number |
|---------------------|----------------|----------------------|-------------|---------------------------|
| 2314                | 28             | Sub-Miniature Bi-Pin | BP202       | BP202-NFX28H              |
| 2324                | 28             | Sub-Miniature Bi-Pin | BP202       | BP202-NFX28H              |
| 2335                | 14             | Sub-Miniature Bi-Pin | BP202       | BP202-NFX15H              |
| 2337                | 6.3VAC         | Sub-Miniature Bi-Pin | BP202       | BP202-NFX6H               |
| 3149                | 5              | Sub-Miniature Bi-Pin | BP202       | BP202-NFX5H               |
| 7001                | 24             | Sub-Miniature Bi-Pin | BP202       | BP202-NFX24H              |
| 7003                | 24             | Sub-Miniature Bi-Pin | BP202       | BP202-NFX24H              |
| 7327                | 28             | Sub-Miniature Bi-Pin | BP202       | BP202-NFX28H              |
| 7328                | 6              | Sub-Miniature Bi-Pin | BP202       | BP202-NFX6H               |
| 7330                | 14             | Sub-Miniature Bi-Pin | BP202       | BP202-NFX15H              |
| 7349                | 6.3VAC         | Sub-Miniature Bi-Pin | BP202       | BP202-NFX6H               |
| 7361                | 5              | Sub-Miniature Bi-Pin | BP202       | BP202-NFX5H               |
| 7371                | 12             | Sub-Miniature Bi-Pin | BP202       | BP202-NFX12H              |
| 7373                | 14             | Sub-Miniature Bi-Pin | BP202       | BP202-NFX15H              |
| 7376                | 28             | Sub-Miniature Bi-Pin | BP202       | BP202-NFX28H              |
| 7377                | 6.3VAC         | Sub-Miniature Bi-Pin | BP202       | BP202-NFX6H               |
| 7380                | 6.3VAC         | Sub-Miniature Bi-Pin | BP202       | BP202-NFX6H               |
| 7381                | 6.3VAC         | Sub-Miniature Bi-Pin | BP202       | BP202-NFX6H               |
| 7382                | 14             | Sub-Miniature Bi-Pin | BP202       | BP202-NFX15H              |
| 7387                | 28             | Sub-Miniature Bi-Pin | BP202       | BP202-NFX28H              |
| 7876                | 28             | Sub-Miniature Bi-Pin | BP202       | BP202-NFX28H              |
| 7945                | 6              | Sub-Miniature Bi-Pin | BP202       | BP202-NFX6H               |
| 327                 | 28             | Sub-Miniature Flange | MF200       | MF200-NFX28H              |
| 328                 | 6              | Sub-Miniature Flange | MF200       | MF200-NFX6H               |
| 330                 | 14             | Sub-Miniature Flange | MF200       | MF200-NFX15H              |
| 345                 | 6              | Sub-Miniature Flange | MF200       | MF200-NFX6H               |
| 349                 | 6.3VAC         | Sub-Miniature Flange | MF200       | MF200-NFX6H               |
| 350                 | 6.3VAC         | Sub-Miniature Flange | MF200       | MF200-NFX6H               |
| 370                 | 18             | Sub-Miniature Flange | MF200       | MF200-NFX24H              |
| 376                 | 28             | Sub-Miniature Flange | MF200       | MF200-NFX28H              |
| 377                 | 6.3VAC         | Sub-Miniature Flange | MF200       | MF200-NFX6H               |
| 380                 | 6.3VAC         | Sub-Miniature Flange | MF200       | MF200-NFX6H               |
| 381                 | 6.3VAC         | Sub-Miniature Flange | MF200       | MF200-NFX6H               |
| 382                 | 14             | Sub-Miniature Flange | MF200       | MF200-NFX15H              |
| 385                 | 28             | Sub-Miniature Flange | MF200       | MF200-NFX28H              |
| 387                 | 28             | Sub-Miniature Flange | MF200       | MF200-NFX28H              |
| 394                 | 12             | Sub-Miniature Flange | MF200       | MF200-NFX12H              |
| 459                 | 22             | Sub-Miniature Flange | MF200       | MF200-NFX24H              |
| 7332                | 5              | Sub-Miniature Flange | MF200       | MF200-NFX5H               |
| 7333                | 5              | Sub-Miniature Flange | MF200       | MF200-NFX5H               |
| 7335                | 5              | Sub-Miniature Flange | MF200       | MF200-NFX5H               |
| 7341                | 28             | Sub-Miniature Flange | MF200       | MF200-NFX28H              |
| 8918                | 14             | Sub-Miniature Flange | MF200       | MF200-NFX15H              |

| Incandescent Lamp # | Design Voltage | Base Description     | VCC Model # | Suggested VCC Part Number |
|---------------------|----------------|----------------------|-------------|---------------------------|
| 334                 | 28             | Sub-Miniature Groove | MG200       | MG200-NFX28H              |
| 336                 | 14             | Sub-Miniature Groove | MG200       | MG200-NFX15H              |
| 337                 | 6              | Sub-Miniature Groove | MG200       | MG200-NFX6H               |
| 379                 | 6.3VAC         | Sub-Miniature Groove | MG200       | MG200-NFX6H               |
| 386                 | 14             | Sub-Miniature Groove | MG200       | MG200-NFX15H              |
| 388                 | 28             | Sub-Miniature Groove | MG200       | MG200-NFX28H              |
| 398                 | 6.3VAC         | Sub-Miniature Groove | MG200       | MG200-NFX6H               |
| 335                 | 28             | Sub-Miniature Screw  | MS200       | MS200-NFX28H              |
| 342                 | 6              | Sub-Miniature Screw  | MS200       | MS200-NFX6H               |
| 369                 | 28             | Sub-Miniature Screw  | MS200       | MS200-NFX28H              |
| 373                 | 14             | Sub-Miniature Screw  | MS200       | MS200-NFX15H              |
| 378                 | 6.3VAC         | Sub-Miniature Screw  | MS200       | MS200-NFX6H               |
| 383                 | 14             | Sub-Miniature Screw  | MS200       | MS200-NFX15H              |
| 399                 | 28             | Sub-Miniature Screw  | MS200       | MS200-NFX28H              |
| 17                  | 28             | Sub-Miniature Groove | WB201       | WB201-NFX28H              |
| 18                  | 14             | Sub-Miniature Screw  | WB201       | WB201-NFX15H              |
| 37                  | 14             | Sub-Miniature Screw  | WB201       | WB201-NFX15H              |
| 56                  | 5              | Sub-Miniature Screw  | WB201       | WB201-NFX5H               |
| 73                  | 14             | Sub-Miniature Screw  | WB201       | WB201-NFX15H              |
| 74                  | 14             | Sub-Miniature Screw  | WB201       | WB201-NFX15H              |
| 79                  | 6              | Sub-Miniature Screw  | WB201       | WB201-NFX6H               |
| 84                  | 6.3VAC         | Sub-Miniature Screw  | WB201       | WB201-NFX6H               |
| 85                  | 28             | Sub-Miniature Screw  | WB201       | WB201-NFX28H              |
| 86                  | 6.3VAC         | Sub-Miniature Screw  | WB201       | WB201-NFX6H               |

**Note:** The X in the part number represent the LED color (Ex. WB201-NFA6H is with an Amber LED)

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## VCC:

[BP202-BCA24H](#) [BP202-BCG24H](#) [BP202-BCR24H](#) [BP202-NFG12H](#) [BP202-NFG15H](#) [BP202-NFR12H](#) [BP202-NFW15H](#) [BP202-NKW24H](#) [BP202-NWA28H](#) [BP202-NWB28H](#) [BP202-NWG24H](#) [BP202-NWG28H](#) [BP202-NWO28H](#) [BP202-NWR24H](#) [BP202-NWR28H](#) [BP202-NWW28H](#) [MF200-BCA12H](#) [MF200-BCA15H](#) [MF200-BCA2](#) [MF200-BCG12H](#) [MF200-BCG15H](#) [MF200-BCG2](#) [MF200-BCG24H](#) [MF200-BCG5H](#) [MF200-BCR15H](#) [MF200-BCR2](#) [MF200-BCR24H](#) [MF200-BCR5H](#) [MF200-GLP12](#) [MF200-GLP2](#) [MF200-GLP28](#) [MF200-GLP5](#) [MF200-LRG12H](#) [MF200-LRG2](#) [MF200-LRG5H](#) [MF200-NFA120](#) [MF200-NFA12H](#) [MF200-NFA15H](#) [MF200-NFA2](#) [MF200-NFA5H](#) [MF200-NFB12H](#) [MF200-NFB2](#) [MF200-NFB5H](#) [MF200-NFG120](#) [MF200-NFG12H](#) [MF200-NFG15H](#) [MF200-NFG2](#) [MF200-NFG5H](#) [MF200-NFG6H](#) [MF200-NFR120](#) [MF200-NFR12H](#) [MF200-NFR15H](#) [MF200-NFR2](#) [MF200-NFR5H](#) [MF200-NFR6H](#) [MF200-NFW120](#) [MF200-NFW12H](#) [MF200-NFW15H](#) [MF200-NFW2](#) [MF200-NFW28HD](#) [MF200-NFW5H](#) [MF200-NFW6H](#) [MF200-NKB24H](#) [MF200-NKB28H](#) [MF200-NKG120](#) [MF200-NKG24H](#) [MF200-NKL12H](#) [MF200-NKO28H](#) [MF200-NKR15H](#) [MF200-NKR24H](#) [MF200-NKW12H](#) [MF200-NKW24H](#) [MF200-NKW28H](#) [MF200-NWA15H](#) [MF200-NWA2](#) [MF200-NWA5H](#) [MF200-NWB12H](#) [MF200-NWB15H](#) [MF200-NWB2](#) [MF200-NWB5H](#) [MF200-NWG12H](#) [MF200-NWG2](#) [MF200-NWG5H](#) [MF200-NWG6H](#) [MF200-NWL2](#) [MF200-NWO15H](#) [MF200-NWO5H](#) [MF200-NWR120](#) [MF200-NWR2](#) [MF200-NWR5H](#) [MF200-NWW120](#) [MF200-NWW12H](#) [MF200-NWW15H](#) [MF200-NWW2](#) [MF200-NWW5H](#) [MF200-RLP12](#) [MG200-GLP5](#) [MG200-LRG12H](#) [MG200-LRG15H](#) [MG200-NFA12H](#)