

# Electromagnetic Coupling RFID System V600













## Non-contact Data Communications System

- Superior environmental resistance.
- Heat-resistant type available (150°C max.).
- High memory capacity of 8 Kbytes for Built-in-battery Data Carriers and 254 bytes for Battery-less Data Carriers.
- Built-in-battery Data Carriers have a battery life detecting function.
- Data of Battery-less Data Carriers can be overwritten 300,000 times at normal temperatures.
- Thin, compact, and low-cost Data Carriers are available.
- Transmission distance of 100 mm max.









## Ordering Information

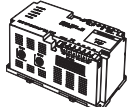
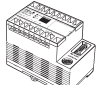



### ■ Data Carriers

| Item                    | Specifications/Design/Memory capacity              | Model   |
|-------------------------|--|---|
| Built-in-battery DCs    | Rectangular compact<br>65 × 40 × 15 mm             | 8 Kbytes<br> <b>V600-D8KR12</b>  |
|                         | Thin rectangular<br>86 × 54 × 10.3 mm              |  <b>V600-D8KR13</b>              |
|                         | Intermediate-range rectangular<br>86 × 54 × 20 mm  |  <b>V600-D8KR04</b>              |
| Replaceable-battery DCs | Compact<br>65 × 40 × 5 mm                          | 2 Kbytes<br> <b>V600-D2KR16</b>  |
| Battery-less DCs        | Ultrathin card-type<br>86 × 54 × 1.5 mm            | 254 bytes<br> <b>V600-D23P71</b> |
|                         | Thin half-size card-type<br>50 × 34 × 1.5 mm       |  <b>V600-D23P72</b>              |
|                         | Rectangular<br>34 × 34 × 3.5 mm                    |  <b>V600-D23P66N</b>             |
|                         | Rectangular package with PFA<br>95 × 36.5 × 6.5 mm |  <b>V600-D23P66SP</b>             |
|                         | Rectangular compact<br>32 × 24 × 6 mm              |  <b>V600-D23P61</b>              |
|                         | Round super-compact<br>8 dia. × 5 mm               |  <b>V600-D23P53</b>              |
|                         | Round compact<br>12 dia. × 6 mm                    |  <b>V600-D23P54</b>              |
|                         | Round super-compact<br>8 dia. × 5 mm               |  <b>V600-D23P55</b>              |

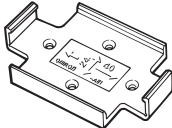
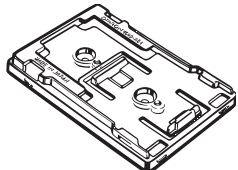
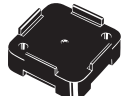

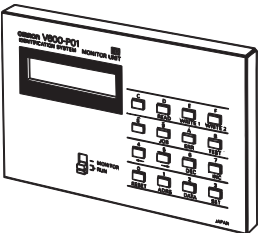
■ R/W Heads

| Item                    |                   | Specifications/Design                  |             | Model   |                    |
|-------------------------|-------------------|--|-------------|---|--------------------|
| Rectangular type        |                   | Dimensions: 100 × 100 × 30 mm          | 0.5-m cable |  | V600-H07 (0.5 m)   |
|                         |                   |  | 2-m cable   |   | V600-H07 (2 m)     |
|                         |                   |  | 5-m cable   |   | V600-H07 (5 m)     |
|                         |                   |  | 10-m cable  |   | V600-H07 (10 m)    |
|                         |                   | Dimensions: 53 × 40 × 23 mm            | 0.5-m cable |  | V600-H11 (0.5 m)   |
|                         |                   |  | 0.5-m cable |   | V600-H11-R (0.5 m) |
|                         |                   |  | 2-m cable   |   | V600-H11 (2 m)     |
|                         |                   |  | 5-m cable   |   | V600-H11 (5 m)     |
| Cylinder type           |                   | Dimensions: 22 dia. × 80 mm            | 0.5-m cable |  | V600-H51 (0.5 m)   |
|                         |                   |  | 2-m cable   |   | V600-H51 (2 m)     |
|                         |                   |  | 5-m cable   |   | V600-H51 (5 m)     |
|                         |                   |  | 10-m cable  |   | V600-H51 (10 m)    |
|                         |                   | Dimensions: 22 dia. × 85 mm            | 0.5-m cable |  | V600-H52 (0.5 m)   |
|                         |                   |  | 2-m cable   |   | V600-H52 (2 m)     |
|                         |                   |  | 5-m cable   |   | V600-H52 (5 m)     |
|                         |                   |  | 10-m cable  |   | V600-H52 (10 m)    |
| Separate-amplifier type | Amplifier section | 73.8 × 22.6 × 36.5 mm, with 2-m cable  |             |  | V600-HA51 (2 m)    |
|                         |                   | 73.8 × 22.6 × 36.5 mm, with 5-m cable  |             |   | V600-HA51 (5 m)    |
|                         |                   | 73.8 × 22.6 × 36.5 mm, with 10-m cable |             |   | V600-HA51 (10 m)   |
|                         | Sensor section    | 12 dia. × 35 mm deep, with 2-m cable   |             |  | V600-HS51          |
|                         |                   | 30.5 × 18 × 10 mm, with a 2-m cable    |             |   | V600-HS61          |
|                         |                   |  |             |   |                    |

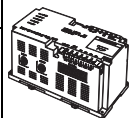
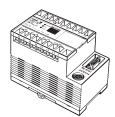
■ ID Controllers

| Item                   |  | Specifications/Design  |   | Model   |   |
|------------------------|--|--|---|---|---|
| AC Power Supply        |  | 100 to 240 VAC, 50/60 Hz<br>Two R/W Head connectors<br>200 × 100 × 100 mm            | RS-232C host interface  |  | V600-CA1A-V2  |
|                        |  |  | RS-422 host interface   |   | V600-CA2A-V2  |
|                        |  |  | Parallel PNP host interface   |   | V600-CA8A-V2  |
|                        |  |  | Parallel NPN host interface   |   | V600-CA9A-V2  |
| DC Power Supply        |  | 24 VDC<br>R/W Head connectors<br>115 × 68 × 80 mm                                    | RS-232C host interface  |  | V600-CD1D-V3  |
|                        |  |  |   |   | 24-VDC, 5-VDC 2-system input<br>R/W Head connectors<br>Board type |
| Handheld Controller    |  | A Battery Charger, Ni-Cd Battery Pack, Battery Case, and Carrying Belt are included. |   |  | V600-CB-US-S  |
| AC Power Supply        |  | 100 to 240 VAC, 50/60 Hz<br>Relay contact output type                                |  | IDSC-C1DR-A   |   |
|                        |  |  |   | 150 to 240 VAC, 50/60 Hz<br>Transistor output type                                    | IDSC-C1DT-A   |
| Handheld Reader/Writer |  | RS-232C Host Interface; use V600-A20 power pack.                                     |   |  | V600-CH1D   |

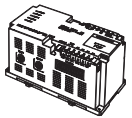
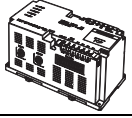
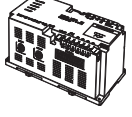
## ■ Accessories (Order Separately)

| Item                          | Specifications/Design  | Model  |                          |
|-------------------------------|--|--|--------------------------|
| Extension cable for R/W Heads | Standard cable<br>Non-water-resistant connectors   | 3-m cable  | V600-A45                 |
|                               |  | 5-m cable  | V600-A44                 |
|                               |  | 10-m cable   | V600-A40                 |
|                               |  | 20-m cable   | V600-A41                 |
|                               |  | 30-m cable   | V600-A42                 |
|                               | Robotic cable<br>Non-water-resistant connectors  | 3-m cable  | V600-A56                 |
|                               |  | 5-m cable  | V600-A55                 |
|                               |  | 10-m cable   | V600-A50                 |
|                               |  | 20-m cable   | V600-A51                 |
|                               |  | 30-m cable   | V600-A52                 |
| Holder                        | For the V600-D2KR16<br>*Mount with M3 flat countersunk head screws (at least two).                                   |   | V600-A81                 |
|                               | For the V600-D23P71/D23P72<br>Ultrasonic deposition can be used on the plastic container.                            |    | V600-A84                 |
| Attachment                    | For the V600-D23P66N   |   | V600-A86                 |
| Lithium battery               | For the V600-D2KR16<br>Commercially available CR2016 battery<br>(includes replacement battery cover seal, and cover) |  | V600-A82 (5 in each set) |
| Power pack                    | For the RFID CH1D Reader/Writer  |  | V600-A20                 |
| Monitor Unit                  | Special Unit for the V600-CA□A-□ Controller  |  | V600-P01                 |

## ■ RS-232C Cables (Order Separately)









| Cable     | Compatible ID Controllers   | Model     |
|-----------|---|-----------|
| 2-m cable |  V600-CA1A-V2              | XW2Z-200P |
| 5-m cable |   | XW2Z-500P |
| 2-m cable |  V600-CD1D-V3<br>V600-CM1D | XW2Z-200S |
| 5-m cable |   | XW2Z-500S |

## ■ Connectors for ID Controllers (One Set per Unit)

| Connector      | Compatible ID Controllers  | Model                           |
|----------------|--|---------------------------------|
| Connector Plug |  V600-CA2A-V2<br>V600-CD1D-V3<br>V600-CM1D | XM2A-0901                       |
| Connector Hood |  | XM2S-0911                       |
| Connector Plug |  V600-CA1A-V2                              | XM2A-2501                       |
| Connector Hood |  | XM2S-2511                       |
| Connector Plug |  V600-CA8A-V2<br>V600-CA9A-V2              | MR-50F<br>(Honda Tsushin Kogyo) |
| Connector Hood |  | MR-50L<br>(Honda Tsushin Kogyo) |





# Specifications

## ■ Battery-less Data Carriers

| Description   |                     | Ultra-thin Card-type  | Ultra-thin Half-size Card-type   | Rectangular Compact   | Chemical-resistant  | Rectangular Compact  | Round Super-compact  | Round Compact   | Round Super-compact  |
|---|---------------------|---|--|---|---|--|--|---|--|
| Item  | Model               | V600-D23P71<br>                          | V600-D23P72<br> | V600-D23P66N<br>                 | V600-D23P66SP<br>                        | V600-D23P61<br> | V600-D23P53<br> | V600-D23P54<br>                | V600-D23P55<br> |
|   | Memory capacity     |   | 254 bytes  |   |   |  |  |   |  |
| Memory type   |                     | EEPROM (non-volatile memory)  |  |   |   |  |  |   |  |
| Transmission distance   |                     | Refer to "Transmission Distance Specifications for Battery-less DCs" on page 12.  |  |   |   |  |  |   |  |
| Data retention time (after writing data)  |                     | 10 years  |  | 10 years (-40 to 110°C)<br>1 year (-40 to 150°C)  | 10 years  |  |  | 10 years (-40 to 110°C)<br>1 year (-40 to 150°C)  |  |
| Number of overwrites (per address) (Refer to separate item for ambient temperature) | Up to 0°C           | 800,000 times   |  |   |   |  |  |   |  |
|   | Up to 25°C          | 400,000 times   |  |   |   |  |  |   |  |
|   | Up to 60°C          | 300,000 times   |  |   |   |  |  |   |  |
|   | Up to 85°C          | 100,000 times   |  |   |   |  |  |   |  |
| Transmission error detection  |                     | 16-bit CRC in both directions (CRC: Cyclic Redundancy Check)  |  |   |   |  |  |   |  |
| Ambient temperature   | For data storage    | -20 to 110°C  |  | -40 to 150°C (See note.)  | -40 to 110°C  | -40 to 85°C  |  | -40 to 150°C (See note.)  |  |
|   | For reading/writing | -10 to 70°C   |  | -20 to 85°C   | -20 to 70°C   | -25 to 70°C  |  | -25 to 85°C   |  |
| Storage temperature   |                     | -20 to 110°C  |  | -40 to 150°C (See note.)  | -40 to 110°C  | -40 to 85°C  |  | -40 to 150°C (See note.)  |  |
| Ambient humidity  |                     | Operating: 35% to 95%   |  |   |   |  |  |   |  |
| Degree of protection  |                     | IEC 60529: IP67   |  | IEC 60529: IP68   | IEC 60529: IP67   | IEC 60529: IP67  |  | IEC 60529: IP67   |  |
| Vibration resistance (destruction)  |                     | 10 to 2,000 Hz, 3.0-mm double amplitude, 300 m/s <sup>2</sup> acceleration for 30 min each in 3 directions (90 min total) |  | 10 to 2,000 Hz, 1.5-mm double amplitude, 150 m/s <sup>2</sup> acceleration 10 times each in 3 directions (15 min) | 10 to 2,000 Hz, 3.0-mm double amplitude, 300 m/s <sup>2</sup> acceleration for 30 min each in 3 directions (90 min total) |  |  | 10 to 2,000 Hz, 1.5-mm double amplitude, 150 m/s <sup>2</sup> acceleration 10 times each in 3 directions (15 min) |  |
| Shock resistance (destruction)  |                     | 1,000 m/s <sup>2</sup> 3 times each in 3 directions (18 times total)  |  | 500 m/s <sup>2</sup> 3 times each in 3 directions (18 times total)  | 1,000 m/s <sup>2</sup> 3 times each in 3 directions (18 times total)  |  |  | 500 m/s <sup>2</sup> 3 times each in 3 directions (18 times total)  |  |
| Weight  |                     | Approx. 15 g  | Approx. 5 g  | Approx. 6.5 g   | Approx. 19 g  | Approx. 5.8 g  | Approx. 0.4 g  | Approx. 1.0 g   | Approx. 0.6 g  |

**Note:** The 150°C heat resistance was confirmed by leaving the Unit at 150°C for 1,000 continuous hours, and by a thermal shock test consisting of 1,000 -10°C/150°C cycles of 30 min each. No defect was found among the 22 test samples.

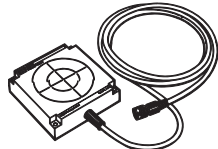



## ■ Built-in-Battery Data Carriers

| Description                        |                     | Rectangular Compact   | Rectangular Thin  | Rectangular Intermediate Range   | Rectangular Compact with Replaceable Battery  |
|------------------------------------|---------------------|---|---|--|---|
| Model                              |                     | V600-D8KR12   | V600-D8KR13   | V600-D8KR04  | V600-D2KR16   |
| <b>Item</b>                        |                     |    |  |  |                                  |
| Memory capacity                    |                     | 8 Kbytes  |   |  | 2 Kbytes  |
| Memory type                        |                     | SRAM (volatile memory)  |   |  |   |
| Transmission distance              |                     | Refer to “Transmission Distance Specifications for Built-in DCs” found in the <i>Specifications</i> section of this data sheet. |   |  |   |
| Battery life (See note 1.)         |                     | Refer to “Battery Life” found in the Specifications section of this data sheet.   |   |  | 2 years (at 25°C)<br>(See note 2.)  |
| Number of reads/writes             |                     | Unlimited   |   |  | Unlimited (Does not affect battery life)  |
| Transmission error detection       |                     | 16-bit CRC in both directions (CRC: Cyclic Redundancy Check)  |   |  |   |
| Ambient temperature                | For data storage    | -40 to 70°C   |   |  | -15 to 70°C   |
|                                    | For reading/writing | -25 to 70°C   |   |  | 0 to 50°C   |
| Storage temperature                |                     | -40 to 70°C   |   |  | -15 to 70°C   |
| Ambient humidity                   |                     | 35% to 95%  |   |  | 35% to 85%  |
| Storage humidity                   |                     | 35% to 95%  |   |  |   |
| Degree of protection               |                     | IEC 60529: IP67   |   |  | IEC 60529: IP50 (dustproof)<br>(See note 3.)  |
| Vibration resistance (destruction) |                     | 10 to 500 Hz, 1.0-mm single amplitude, 150 m/s <sup>2</sup> acceleration for 11 min each in X, Y, and Z directions              |   |  | 10 to 150 Hz, 0.75-mm single amplitude, 100-m/s <sup>2</sup> acceleration for 30 min each in X, Y, and Z directions |
| Shock resistance (destruction)     |                     | 1,000 m/s <sup>2</sup> 3 times each in X, Y, and Z directions (18 times total)  |   |  | 300 m/s <sup>2</sup> 3 times each in X, Y, and Z directions (18 times total)  |
| Weight                             |                     | Approx. 70 g  |   | Approx. 160 g  | Approx. 15 g  |

**Note: 1.** A low battery detection function is built-in.




- 2.** The battery life is applicable for batteries used at a temperature of 25°C. For details on the relationship between temperature and battery life, refer to “Temperature and Battery Life,” in this data sheet, found just before the “Precautions” section. The CR2016 is provided as the replacement battery (see “Accessories” in the *Ordering Information* of this data sheet). The Data Carrier is dustproof when the provided battery replacement cover seal is used.

## ■ Read/Write (R/W) Heads (with Built-in Amplifier)

| Model                                 | V600-H07  | V600-H11/H11-R   | V600-H51  | V600-H52  |
|---------------------------------------|---|--|---|---|
| Item                                  |    |  |  |  |
| Oscillation frequency                 | 530 kHz   |  |   |   |
| Ambient temperature                   | -25 to 70°C   |  | -10 to 60°C   |   |
| Storage temperature                   | -40 to 85°C   |  | -25 to 75°C   |   |
| Ambient humidity                      | 35% to 95%  |  |   |   |
| Storage humidity                      | 35% to 95%  |  |   |   |
| Insulation resistance                 | 50 MΩ (at 500 VDC) between cable terminals and case   |  |   |   |
| Dielectric strength                   | 1,000 VAC, 50/60 Hz for 1 min between cable terminals and case (Leakage current: 1 mA max.)                                     |  |   |   |
| Degree of protection                  | IEC 60529: IP67   |  |   |   |
| Vibration resistance (destruction)    | 10 to 500 Hz, 1.0-mm single amplitude, 150 m/s <sup>2</sup> acceleration with 3 sweeps of 11 min each in X, Y, and Z directions |  |   |   |
| Shock resistance                      | Destruction: 500 m/s <sup>2</sup> 3 times each in X, Y, and Z directions (18 times total)                                       |  |   |   |
| Cable length (See note 1.)            | Standard lengths of 0.5 m, 2 m, 5 m, and 10 m.  |  |   |   |
| Wireless transmission error detection | 16-bit CRC in both directions (CRC: Cyclic Redundancy Check)  |  |   |   |
| Indicators                            | Power: green; transmission: orange  |  |   |   |
| Weight                                | Approx. 1 kg (with 10-m cable)  | Approx. 650 g (with 10-m cable)  |   |   |

- Note:**
1. Extension cables are also available. The maximum cable length is 30.5 m for the V600-H07 and 50.5 m for the V600-H11/H51/H52.
  2. The connectors are not water-resistant.

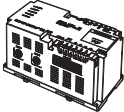
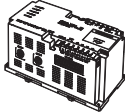
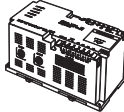
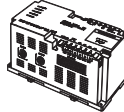

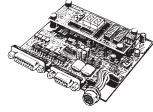
## ■ R/W Heads (with Separate Amplifier)

| Item                                  | Model   | Sensor section  |   | Amplifier section   |   |
|---------------------------------------|---|---|---|---|---|
|                                       |   | V600-HS51   | V600-HS61   | V600-HA51   |   |
|                                       |   |  |  |  |   |
| Oscillation frequency                 | 530 kHz   |   | ---   |   |   |
| Ambient temperature                   | -10 to 60°C   |   |   |   |   |
| Storage temperature                   | -25 to 75°C   |   |   |   |   |
| Ambient humidity                      | 35% to 95%  |   |   |   |   |
| Insulation resistance                 | 50 MΩ (at 500 VDC) between cable terminals and case   |   |   |   |   |
| Dielectric strength                   | 1,000 VAC 50/60 Hz for 1 min between cable terminals and case (Leakage current: 1 mA max.)                              |   |   |   |   |
| Degree of protection                  | IEC 60529: IP67   |   |   | IEC 60529: IP66   |   |
| Vibration resistance (destruction)    | 10 to 2,000 Hz, 1.5-mm single amplitude, 300 m/s <sup>2</sup> acceleration with 2 sweeps of 15 min each in 3 directions |   |   | Installed in panel  | 10 to 2,000 Hz, 1.5-mm single amplitude, 300-m/s <sup>2</sup> acceleration with 2 sweeps of 11 min each in 3 directions |
|                                       |   |   |   | DIN Track installation  | 10 to 500 Hz, 1.0-mm single amplitude, 150-m/s <sup>2</sup> acceleration with 3 sweeps of 11 min each in 3 directions   |
| Shock resistance (destruction)        | 1,000 m/s <sup>2</sup> 3 times each in 3 directions (18 times total)  |   |   | 500 m/s <sup>2</sup> 3 times each in 3 directions (18 times total)                  |   |
| Cable length                          | Sensor to amplifier   | 2 m (fixed)   |   |   | ---   |
|                                       | Amplifier to controller   | ---   |   |   | Standard lengths of 2 m, 5 m, and 10 m (See note 1.)  |
| Wireless transmission error detection | 16-bit CRC in both directions (CRC: Cyclic Redundancy Check)  |   |   |   |   |
| Indicators                            | ---   |   |   | Power: green; transmission: orange  |   |
| Weight                                | Approx. 70 g (with 2-m cable)   |   |   | Approx. 650 g (with 10-m cable)   |   |

**Note:** 1. Extension cables are also available. The maximum cable length is 50 m for the V600-HA51. Extension cables are not available for the V600-HS51/HS61.

2. The connectors are not water-resistant.

## ■ ID Controllers

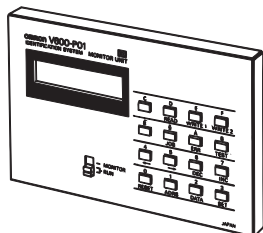
| Series Model                    | V600 Series (Electromagnetic RFID System)   |   |   |  |   |   |
|---------------------------------|---|---|---|--|---|---|
|                                 | V600-CA1A-V2  | V600-CA2A-V2  | V600-CA8A-V2  | V600-CA9A-V2   | V600-CD1D-V3  | V600-CM1D   |
| Item                            |    |  |  |  |    |  |
| Host interface                  | RS-232C   | RS-422A<br>(Maximum of 16 Units can be connected)                                 | Parallel PNP output   | Parallel NPN output  | RS-232C   |   |
| Possible number of R/W Heads    | 2   |   |   |  | 1   |   |
| Power supply voltage            | 100 to 240 VAC, 50/60 Hz  |   |   |  | 24 VDC  | 24 VDC, 5 VDC   |
| Acceptable power supply voltage | 85 to 264 VAC   |   |   |  | 20.4 to 26.4 VDC  | 20.4 to 26.4 VDC<br>4.5 to 5.5 VDC  |
| Power consumption               | 35 VA max.  |   |   |  | 7.2 W max.  | 24 VDC:<br>7.2 W max.<br>5 VDC:<br>1.5 W max.                                       |
| Insulation resistance           | 50 MΩ min. (at 500 VDC) between power terminals and case, between I/O terminals and case, or between the power supply terminals and I/O terminals |   |   |  |   |   |
| Dielectric strength             | 1,500 VAC, 50/60 Hz for 1 min between the points listed above;<br>Leakage current: 10 mA max.   |   |   |  | 1,000 VAC, 50/60 Hz for 1 min between the points listed above;<br>Leakage current: 10 mA max.                               |   |
| Noise immunity                  | 1,500-V (p-p) pulses of 100-ns to 1-μs pulse width with a 1-ns rise time  |   |   |  |   |   |
| Vibration resistance            | Destruction   | 10 to 150 Hz, 0.3-mm double amplitude for 32 min each in X, Y, and Z directions   |   |  |   |   |
|                                 | Malfunction   | 10 to 150 Hz, 0.2-mm double amplitude for 32 min each in X, Y, and Z directions   |   |  |   |   |
| Shock resistance                | Destruction: 200 m/s <sup>2</sup> 3 times each in X, Y, and Z directions (18 times total)   |   |   |  |   |   |
| Ambient temperature             | -10 to 55°C   |   |   |  |   | 0 to 50°C   |
| Ambient humidity                | 35% to 85% (with no condensation)   |   |   |  |   |   |
| Operating conditions            | No corrosive gases  |   |   |  |   |   |
| Storage temperature             | -25 to 65°C   |   |   |  |   | -15 to 70°C   |
| Memory back-up                  | A capacitor backs up the most recent error data and statistical error data for up to 20 days (at 25°C) after a power interruption.                |   |   |  | Memory backup is not available. Error details, however, can be read from the personal computer when the power is turned ON. |   |
| Diagnostic functions            | Checks for CPU errors, memory errors, power interruptions, and transmission errors  |   |   |  |   |   |
| Ground                          | Ground to 100 Ω or less.  |   |   |  |   |   |
| Degree of protection            | IEC 60529: IP30 (panel mounted)   |   |   |  |   |   |
| Weight                          | Approx. 890 g   | Approx. 930 g   | Approx. 960 g   | Approx. 360 g  | Approx. 180 g   |   |

## ■ Monitor Unit

### V600-P01 (for use with V600-CA□A Controllers)

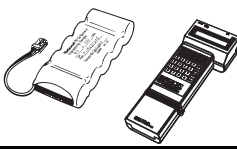
The Monitor Unit is a monitoring device that can be mounted to an ID Controller. It can be used to test communications between the R/W Head and Data Carrier when the RFID System is started up, check the data in Data Carriers, and read error information or statistical error information.

The specifications conform to those of the ID Controller, except the operating temperature range is 0°C to 40°C.





## ■ Handheld ID Controllers

| Item                                  | Model | V600-CB-US-S   |
|---------------------------------------|-------|--|
|                                       |       |                              |
| Power supply                          |       | Built-in nickel-cadmium batteries (6 VDC) or 9-V alkaline batteries (9 VDC) (See note.)                        |
| Power consumption                     |       | 700 mA max.  |
| Continuous operating time (See note.) |       | 3 hrs min. when using the built-in nickel-cadmium batteries;<br>1.5 hrs min. when using the alkaline batteries |
| Automatic power-saver                 |       | The power is turned OFF automatically if a key input or response is not received in 10 min.                    |
| Automatic command cancellation        |       | A command will be cancelled automatically if a response is not received from a Data Carrier within 2 min.      |
| Low battery indicator                 |       | This display appears when the battery voltage falls below the minimum voltage required for operation.          |
| User memory                           |       | 32 Kbytes (Data will be retained for at least 24 hrs after batteries are removed.)                             |
| Vibration resistance                  |       | Destruction: 10 to 150 Hz, 0.3-mm double amplitude for 32 min each in X, Y, and Z directions                   |
| Shock resistance                      |       | Destruction: 200 m/s <sup>2</sup> 3 times each in X, Y, and Z directions (18 times total)                      |
| Ambient temperature                   |       | 0 to 45°C  |
| Ambient humidity                      |       | 35% to 85% (with no condensation)  |
| Operating conditions                  |       | No corrosive gases   |
| Storage temperature                   |       | -25 to 60°C (excluding the battery pack)   |
| Degree of protection                  |       | IEC 60529: IP30  |
| Weight                                |       | 680 g max. (including the battery pack)  |

**Note:** The continuous operating time is for new, fully charged nickel cadmium batteries or new alkaline batteries used at room temperature. Overseas specifications (with UL-listed Battery Charger) also available.

### V600-CB-US-S Configuration

| Item                   | Description                           | Model      |
|------------------------|---------------------------------------|------------|
| Handheld ID Controller | Controller                            | V600-CB-US |
| Battery Charger        | Accessory                             | V600-A14   |
| Battery Case           | Accessory (for alkaline batteries)    | V600-A11   |
| Ni-Cd Battery Pack     | Accessory (built-in to ID Controller) | V600-A12   |
| Carrying Belt          | Accessory                             | V600-A13   |


### Handheld V600-CH1D Wand

|                                  |   |
|----------------------------------|---|
| Power supply                     | 5 VDC from AC adapter   |
| Permissible power supply voltage | 5 VDC ±5%   |
| Current consumption              | 200 mA max. (See Note 1.)   |
| Insulation resistance            | 50 MΩ min. (at 500 VDC) between cable terminals and case  |
| Dielectric strength              | 1,000 VAC, 50/60 Hz for 1 min (1 mA max.) between cable terminals and case                      |
| Noise immunity                   | Power supply line: 1,200 Vp-p<br>I/O line: 800 Vp-p   |
| Vibration resistance             | Destruction: 10 to 150 Hz, 0.3-mm single amplitude, with 4 sweeps of 8 min each in 3 directions |
| Shock resistance                 | Destruction: 294 m/S <sup>2</sup> 3 (approx. 20G) times each in 3 directions                    |
| Ambient temperature              | Operating: -10 to 55°C with no icing; storage: -25 to 65°C with no icing                        |
| Ambient humidity                 | 35% to 85% (with no condensation)   |
| Operating conditions             | No corrosive gases  |
| Enclosure ratings                | IEC: IP63, JIS: IPX3 (waterproof) See note 2.   |
| Material                         | Case: ABS resin; nameplate: PET resin   |
| Cable length                     | 2.5 m   |
| Weight                           | Approx. 180 g (including the connector and cable)   |

**Note:** 1. This figure is for idling or stand-by. The rush current must be 250 mA max.



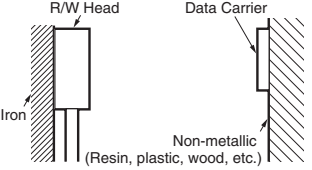




2. This does not include the connector section. The main unit is not resistant to chemicals or oils.

## ■ IDSC Series



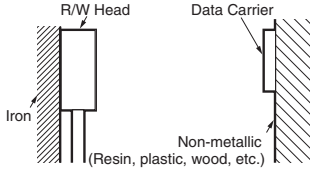




| Item                            | Series | <b>IDSC Series</b><br><b>IDSC-C1DR-A</b><br><b>IDSC-C1DT-A</b>   |
|---------------------------------|--------|--|
|                                 | Model  |  |
| Host interface                  |        | RS-232C  |
| Possible number of R/W Heads    |        | 1  |
| Power supply voltage            |        | 100 to 240 VAC, 50/60 Hz   |
| Acceptable power supply voltage |        | 85 to 264 VAC  |
| Power consumption               |        | 60 VA max.   |
| Insulation resistance           |        | 20 Ω min. (at 500 VDC) between all Power Supply Unit AC external terminals and ground terminals  |
| Dielectric strength             |        | 2,300 VAC, 50/60 Hz for 1 min between Power Supply Unit AC external terminals and ground terminals<br>Leakage current: 10 mA max.  |
| Noise immunity                  |        | 1,500-V (p-p) pulses of 100-ns to 1-μs pulse width with a 1-ns rise time   |
| Vibration resistance            |        | 10 to 57 Hz, 0.075-mm amplitude, 57 to 150 Hz, 9.8 m/s <sup>2</sup> acceleration for 80 min each in X, Y, and Z directions   |
| Shock resistance                |        | 150 m/s <sup>2</sup> 3 times each in X, Y, and Z directions  |
| Ambient temperature             |        | 0 to 55°C  |
| Ambient humidity                |        | 10% to 90% (with no condensation)  |
| Operating conditions            |        | No corrosive gases   |
| Storage temperature             |        | -20 to 75°C (excluding the battery pack)   |
| Memory back-up                  |        | The battery life is 5 years regardless of whether an RTC is provided.<br>The period that data is retained after a power interruption depends on the ambient temperature.<br>Replace the battery within one week of the battery low indicator flashing. |
| Diagnostic functions            |        | Checks for CPU errors, memory errors, power interruptions, and transmission errors   |
| Ground                          |        | Ground to 100 Ω or less.   |
| Construction                    |        | Installed in panel   |
| Weight                          |        | Approx. 1,500 g  |

**Note:** Refer to the applicable ID Controller Operation Manual (Cat. No. W250) for details.



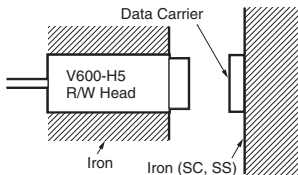
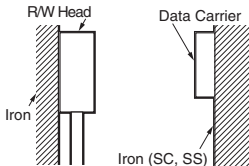
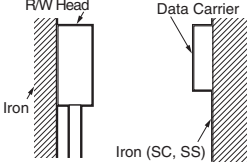
## ■ Transmission Distance Specifications for Battery-less DCs

| Recommended combinations  |   | Installation |                     | Controller mode | Transmission distance                  | Condition for DC and R/W head installation   |
|---|---|--------------|---------------------|-----------------|--|--|
| Data Carrier  | R/W Head  |              | Read/Write distance |                 |  |  |
|  |  | Stationary   | Read/Write distance | Irrelevant      | 10 to 70 mm (max. axial offset ±10 mm) | <p>These Data Carriers are for installation on non-metallic surfaces only.</p>  <p>Data transmission will be impossible if the DC is installed directly on a metal surface. Refer to the <i>V600 R/W Heads and EEPROM Data Carriers Operation Manual</i> (Cat. No. Z128) for details.</p> |
|   |   | Moving       |                     |                 | 30 to 60 mm (max. axial offset ±10 mm) |  |
|  |  | Stationary   | Read/Write distance | Irrelevant      | 5 to 40 mm (max. axial offset ±10 mm)  |  |
|   |   | Moving       |                     |                 | 15 to 40 mm (max. axial offset ±10 mm) |  |
|  |  | Stationary   | Read/Write distance | Irrelevant      | 5 to 30 mm (max. axial offset ±10 mm)  |  |
|   |   | Moving       |                     |                 | 15 to 30 mm (max. axial offset ±10 mm) |  |



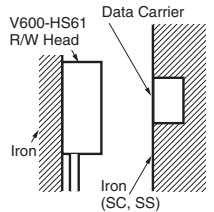
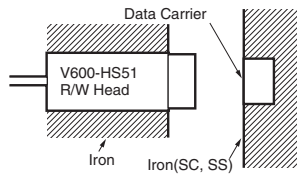
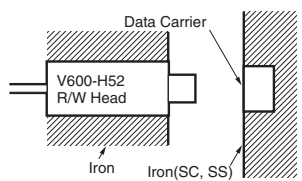






- Note:**
1. The transmission distance/transmission time priority mode setting can be made using the lower-level transmission mode setting switch or memory switch only with a Serial-interface Controller or ID Sensor Unit.
  2. With Parallel-interface Controllers, the mode setting is always transmission distance priority.
  3. The specifications take fluctuations in ambient temperature and slight differences between products into account.

| Recommended combinations   |   | Installation |                | Controller mode                | Transmission distance                  | Condition for DC and R/W head installation  |
|--|---|--------------|----------------|--------------------------------|--|---|
| Data Carrier   | R/W Head  |              |                |                                |  |   |
|   |    | Stationary   | Read distance  | Transmission distance priority | 5 to 45 mm (max. axial offset ±10 mm)  |  <p>Data transmission will be impossible if the DC is installed directly on a metal surface. Refer to the <i>V600 R/W Heads and EEPROM Data Carriers Operation Manual</i> (Cat. No. Z128) for details.</p> |
|  |   |              |                | Transmission time priority     | 5 to 35 mm (max. axial offset ±10 mm)  |   |
|  |   |              | Write distance | Irrelevant                     | 5 to 35 mm (max. axial offset ±10 mm)  |   |
|  |   | Moving       | Read distance  | Transmission distance priority | 25 to 40 mm (max. axial offset ±10 mm) |   |
|  |   |              |                | Transmission time priority     | 25 to 30 mm (max. axial offset ±10 mm) |   |
|  |   |              | Write distance | Irrelevant                     | 25 to 30 mm (max. axial offset ±10 mm) |   |
|  |    | Stationary   | Read distance  | Transmission distance priority | 5 to 30 mm (max. axial offset ±10 mm)  |   |
|  |   |              |                | Transmission time priority     | 5 to 25 mm (max. axial offset ±10 mm)  |   |
|  |   |              | Write distance | Irrelevant                     | 5 to 25 mm (max. axial offset ±10 mm)  |   |
|  |   | Moving       | Read distance  | Transmission distance priority | 15 to 25 mm (max. axial offset ±10 mm) |   |
|  |   |              |                | Transmission time priority     | 15 to 20 mm (max. axial offset ±10 mm) |   |
|  |   |              | Write distance | Irrelevant                     | 15 to 20 mm (max. axial offset ±10 mm) |   |
|  |   | Stationary   | Read distance  | Transmission distance priority | 5 to 40 mm (max. axial offset ±10 mm)  |   |
|  |   |              |                | Transmission time priority     | 5 to 30 mm (max. axial offset ±10 mm)  |   |
|  |   |              | Write distance | Irrelevant                     | 5 to 30 mm (max. axial offset ±10 mm)  |   |
|  |   | Moving       | Read distance  | Transmission distance priority | 20 to 40 mm (max. axial offset ±10 mm) |   |
|  |   |              |                | Transmission time priority     | 20 to 30 mm (max. axial offset ±10 mm) |   |
|  |   |              | Write distance | Irrelevant                     | 20 to 30 mm (max. axial offset ±10 mm) |   |
|  |  | Stationary   | Read distance  | Transmission distance priority | 5 to 25 mm (max. axial offset ±10 mm)  |   |
|  |   |              |                | Transmission time priority     | 5 to 20 mm (max. axial offset ±10 mm)  |   |
|  |   |              | Write distance | Irrelevant                     | 5 to 20 mm (max. axial offset ±10 mm)  |   |
|  |   | Moving       | Read distance  | Transmission distance priority | 10 to 25 mm (max. axial offset ±10 mm) |   |
|  |   |              |                | Transmission time priority     | 10 to 20 mm (max. axial offset ±10 mm) |   |
|  |   |              | Write distance | Irrelevant                     | 10 to 20 mm (max. axial offset ±10 mm) |   |



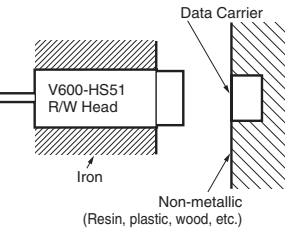

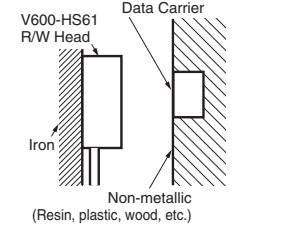
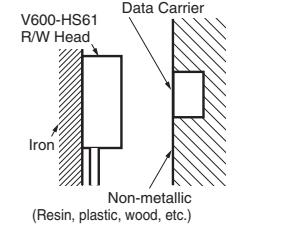
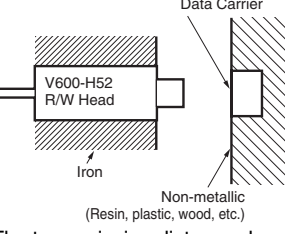
- Note:**
1. The transmission distance/transmission time priority mode setting can be made using the lower-level transmission mode setting switch or memory switch only with a Serial-interface Controller or ID Sensor Unit.
  2. With Parallel-interface Controllers, the mode setting is always transmission distance priority.
  3. The specifications take fluctuations in ambient temperature and slight differences between products into account.

| Recommended combinations  |   | Installation |                | Controller mode                | Transmission distance                  | Condition for DC and R/W head installation   |
|---|---|--------------|----------------|--------------------------------|--|--|
| Data Carrier  | R/W Head  |              |                |                                |  |  |
|  |  | Stationary   | Read distance  | Transmission distance priority | 2 to 19 mm (max. axial offset ±10 mm)  | <p>These Data Carriers can be installed on metallic surfaces.</p>   |
|   |   |              |                | Transmission time priority     | 2 to 16 mm (max. axial offset ±10 mm)  |  |
|   |   |              | Write distance | Irrelevant                     | 2 to 16 mm (max. axial offset ±10 mm)  |  |
|   |   | Moving       | Read distance  | Transmission distance priority | 12 to 19 mm (max. axial offset ±10 mm) |  |
|   |   |              |                | Transmission time priority     | 13 to 16 mm (max. axial offset ±10 mm) |  |
|   |   |              | Write distance | Irrelevant                     | 12 to 16 mm (max. axial offset ±10 mm) |  |
|   |  | Stationary   | Read distance  | Transmission distance priority | 1 to 16 mm (max. axial offset ±10 mm)  |  <p>The listed transmission distances also apply for installation on non-metallic surfaces. Refer to the <i>V600 R/W Heads and EEPROM Data Carriers Operation Manual</i> (Cat. No. Z128) for details.</p> |
|   |   |              |                | Transmission time priority     | 1 to 14 mm (max. axial offset ±10 mm)  |  |
|   |   |              | Write distance | Irrelevant                     | 1 to 14 mm (max. axial offset ±10 mm)  |  |
|   |   | Moving       | Read distance  | Transmission distance priority | 7 to 16 mm (max. axial offset ±10 mm)  |  |
|   |   |              |                | Transmission time priority     | 7 to 14 mm (max. axial offset ±10 mm)  |  |
|   |   |              | Write distance | Irrelevant                     | 7 to 14 mm (max. axial offset ±10 mm)  |  |

- Note:**
1. The transmission distance/transmission time priority mode setting can be made using the lower-level transmission mode setting switch or memory switch only with a Serial-interface Controller or ID Sensor Unit.
  2. With Parallel-interface Controllers, the mode setting is always transmission distance priority.
  3. The specifications take fluctuations in ambient temperature and slight differences between products into account.



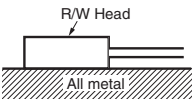
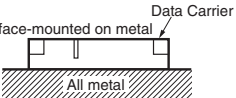

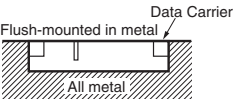



| Recommended combinations   |   | Installation |                | Controller mode                | Transmission distance                   |   | Condition for DC and R/W head installation  |
|--|---|--------------|----------------|--------------------------------|---|---|---|
| Data Carrier   | R/W Head  |              |                |                                |   |   |   |
| V600-D23P53<br>   | V600-HS51<br>(See note 4.)<br>   | Stationary   | Read distance  | Transmission distance priority | 0.5 to 4.0 mm (max. axial offset ±2 mm) | 0.5 to 4.5 mm (max. axial offset ±1 mm) | These Data Carriers are for flush mounting in metallic bases only.<br><br><br><br> |
|  |   |              |                | Transmission time priority     | 0.5 to 3.0 mm (max. axial offset ±2 mm) | 0.5 to 3.5 mm (max. axial offset ±1 mm) |   |
|  |   |              | Write distance | Irrelevant                     | 0.5 to 3.0 mm (max. axial offset ±2 mm) | 0.5 to 3.5 mm (max. axial offset ±1 mm) |   |
|  | V600-HS61<br>(See note 4.)<br>   | Stationary   | Read distance  | Transmission distance priority | 0.5 to 4.0 mm (max. axial offset ±2 mm) | 0.5 to 4.5 mm (max. axial offset ±1 mm) |   |
|  |   |              |                | Transmission time priority     | 0.5 to 3.0 mm (max. axial offset ±2 mm) | 0.5 to 3.5 mm (max. axial offset ±1 mm) |   |
|  |   |              | Write distance | Irrelevant                     | 0.5 to 3.0 mm (max. axial offset ±2 mm) | 0.5 to 3.5 mm (max. axial offset ±1 mm) |   |
|  | V600-H52<br>                     | Stationary   | Read distance  | Transmission distance priority | 0.5 to 4.0 mm (max. axial offset ±2 mm) | 0.5 to 4.5 mm (max. axial offset ±1 mm) |   |
|  |   |              |                | Transmission time priority     | 0.5 to 3.0 mm (max. axial offset ±2 mm) | 0.5 to 3.5 mm (max. axial offset ±1 mm) |   |
|  |   |              | Write distance | Irrelevant                     | 0.5 to 3.0 mm (max. axial offset ±2 mm) | 0.5 to 3.5 mm (max. axial offset ±1 mm) |   |
| V600-D23P54<br> | V600-HS51<br>(See note 4.)<br> | Stationary   | Read distance  | Transmission distance priority | 0.5 to 6.0 mm (max. axial offset ±2 mm) | 0.5 to 6.5 mm (max. axial offset ±1 mm) | The listed transmission distances also apply for installation on non-metallic surfaces. Refer to the <i>V600 R/W Heads and EEPROM Data Carriers Operation Manual</i> (Cat. No. Z128) for details.   |
|  |   |              |                | Transmission time priority     | 0.5 to 5.5 mm (max. axial offset ±2 mm) | 0.5 to 6.0 mm (max. axial offset ±1 mm) |   |
|  |   |              | Write distance | Irrelevant                     | 0.5 to 5.0 mm (max. axial offset ±2 mm) | 0.5 to 5.5 mm (max. axial offset ±1 mm) |   |
|  | V600-HS61<br>(See note 4.)<br> | Stationary   | Read distance  | Transmission distance priority | 0.5 to 6.5 mm (max. axial offset ±2 mm) | 0.5 to 7.0 mm (max. axial offset ±1 mm) |   |
|  |   |              |                | Transmission time priority     | 0.5 to 5.5 mm (max. axial offset ±2 mm) | 0.5 to 6.0 mm (max. axial offset ±1 mm) |   |
|  |   |              | Write distance | Irrelevant                     | 0.5 to 5.5 mm (max. axial offset ±2 mm) | 0.5 to 6.0 mm (max. axial offset ±1 mm) |   |
|  | V600-H52<br>                   | Stationary   | Read distance  | Transmission distance priority | 0.5 to 6.5 mm (max. axial offset ±2 mm) | 0.5 to 7.0 mm (max. axial offset ±1 mm) |   |
|  |   |              |                | Transmission time priority     | 0.5 to 5.5 mm (max. axial offset ±2 mm) | 0.5 to 6.0 mm (max. axial offset ±1 mm) |   |
|  |   |              | Write distance | Irrelevant                     | 0.5 to 5.5 mm (max. axial offset ±2 mm) | 0.5 to 6.0 mm (max. axial offset ±1 mm) |   |

- Note:**
1. The transmission distance/transmission time priority mode setting can be made using the lower-level transmission mode setting switch or memory switch only with a Serial-interface Controller or ID Sensor Unit.
  2. With Parallel-interface Controllers, the mode setting is always transmission distance priority.
  3. The specifications take fluctuations in ambient temperature and slight differences between products into account.
  4. This is the transmission distance when using the V600-HS□1 and V600-HA51 combination.






| Recommended combinations   |   | Installation   |                                | Controller mode                         | Transmission distance                   | Condition for DC and R/W head installation   |
|--|---|----------------|--------------------------------|---|---|--|
| Data Carrier   | R/W Head  |                |                                |   |   |  |
| V600-D23P55<br> | V600-HS51<br>(See note 4.)<br> | Stationary     | Read distance                  | Transmission distance priority          | 0.5 to 6.5 mm (max. axial offset ±2 mm) | These Data Carriers are for flush mounting in non-metallic bases only.<br><br>Iron<br>Non-metallic (Resin, plastic, wood, etc.) |
|  |   |                |                                | Transmission time priority              | 0.5 to 6.0 mm (max. axial offset ±2 mm) |  |
|  |   |                | Write distance                 | Transmission distance priority          | 0.5 to 6.5 mm (max. axial offset ±2 mm) |  |
|  |   |                |                                | Transmission time priority              | 0.5 to 6.0 mm (max. axial offset ±2 mm) |  |
|  | V600-HS61<br>(See note 4.)<br> | Stationary     | Read distance                  | Transmission distance priority          | 0.5 to 7.0 mm (max. axial offset ±2 mm) |  |
|  |   |                |                                | Transmission time priority              | 0.5 to 6.0 mm (max. axial offset ±2 mm) |  |
| Write distance   |   |                | Transmission distance priority | 0.5 to 7.0 mm (max. axial offset ±2 mm) |   |  |
|  |   |                | Transmission time priority     | 0.5 to 6.0 mm (max. axial offset ±2 mm) |   |  |
| V600-H52<br>    | Stationary  | Read distance  | Transmission distance priority | 0.5 to 9.0 mm (max. axial offset ±2 mm) |   |  |
|  |   |                | Transmission time priority     | 0.5 to 8.5 mm (max. axial offset ±2 mm) |   |  |
|  |   | Write distance | Transmission distance priority | 0.5 to 8.5 mm (max. axial offset ±2 mm) |   |  |
|  |   |                | Transmission time priority     | 0.5 to 8.5 mm (max. axial offset ±2 mm) |   |  |
|  |   |                |                                |   |   | <br>V600-HS61 R/W Head<br>Iron<br>Non-metallic (Resin, plastic, wood, etc.)   |
|  |   |                |                                |   |   | <br>V600-H52 R/W Head<br>Iron<br>Non-metallic (Resin, plastic, wood, etc.)   |
|  |   |                |                                |   |   | The transmission distance decreases considerably when flush mounted in non-metallic bases. Refer to the <i>V600 R/W Heads and EEPROM Data Carriers Operation Manual</i> (Cat. No. Z128) for details.               |

- Note:**
1. The transmission distance/transmission time priority mode setting can be made using the lower-level transmission mode setting switch or memory switch only with a Serial-interface Controller or ID Sensor Unit.
  2. With Parallel-interface Controllers, the mode setting is always transmission distance priority.
  3. The specifications take fluctuations in ambient temperature and slight differences between products into account.
  4. This is the transmission distance when using the V600-HS□1 and V600-HA51 combination.

## ■ Transmission Distance Specifications for Built-in-Battery DCs

| Recommended combinations   |   | Installation |                          | Controller mode | Transmission distance                  | Condition for DC and R/W head installation  |   |  |
|--|---|--------------|--------------------------|-----------------|--|---|---|--|
| Data Carrier   | R/W Head  |              |                          |                 |  |   |   |  |
|   |    | Stationary   | Flush-mounted in metal   | Irrelevant      | 10 to 50 mm (max. axial offset ±10 mm) |  |   |  |
|  |   |              | Surface-mounted on metal |                 | 10 to 60 mm (max. axial offset ±10 mm) |   |   |  |
|  |   | Moving       | Flush-mounted in metal   |                 | 25 to 50 mm (max. axial offset ±10 mm) |   |  |  |
|  |   |              | Surface-mounted on metal |                 | 25 to 60 mm (max. axial offset ±10 mm) |   |   |  |
|  |    | Stationary   | Flush-mounted in metal   |                 | Irrelevant                             | 5 to 40 mm (max. axial offset ±10 mm)   |  |  |
|  |   |              | Surface-mounted on metal |                 |  | 5 to 45 mm (max. axial offset ±10 mm)   |   |  |
|  |   | Moving       | Flush-mounted in metal   |                 |  | 25 to 40 mm (max. axial offset ±10 mm)  |   | <p>The listed transmission distances also apply for installation on non-metallic surfaces. Refer to the <i>V600 R/W Heads and SRAM Data Carriers Operation Manual</i> (Cat. No. Z127) for details.</p> |
|  |   |              | Surface-mounted on metal |                 |  | 25 to 45 mm (max. axial offset ±10 mm)  |   |  |
|  |   | Stationary   | Flush-mounted in metal   | Irrelevant      | 10 to 30 mm (max. axial offset ±10 mm) |   |   |  |
|  |   |              | Surface-mounted on metal |                 | 10 to 35 mm (max. axial offset ±10 mm) |   |   |  |
|  |   | Moving       | Flush-mounted in metal   |                 | 20 to 30 mm (max. axial offset ±10 mm) |   |   |  |
|  |   |              | Surface-mounted on metal |                 | 20 to 35 mm (max. axial offset ±10 mm) |   |   |  |
|  |  | Stationary   | Flush-mounted in metal   |                 | Irrelevant                             |   | 10 to 30 mm (max. axial offset ±10 mm)  |  |
|  |   |              | Surface-mounted on metal |                 |  |   |   |  |
|  |   | Moving       | Flush-mounted in metal   |                 |  |   | 15 to 30 mm (max. axial offset ±10 mm)  |  |
|  |   |              | Surface-mounted on metal |                 |  |   |   |  |

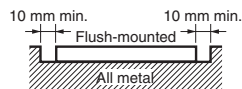
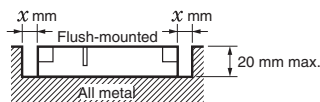


| Recommended combinations   |  | Installation             |   | Controller mode | Transmission distance                                      | Condition for DC and R/W head installation  |   |
|--|--|--------------------------|---|-----------------|--|---|---|
| Data Carrier   | R/W Head   |                          |   |                 |  |   |   |
| V600-D8KR04<br>(unsealed)<br> | V600-H07<br>  | Stationary               | Flush-mounted in metal                      | Irrelevant      | See note1.   | The listed transmission distances also apply for installation on non-metallic surfaces. Refer to the <i>V600 R/W Heads and SRAM Data Carriers Operation Manual</i> (Cat. No. Z127) for details. |   |
|  |  |                          | Surface-mounted on metal                    |                 | 10 to 100 mm (max. axial offset $\pm 10$ mm)               |   |   |
|  |  | Moving                   | Flush-mounted in metal                      |                 | See note1.   |   |   |
|  |  |                          | Surface-mounted on metal                    |                 | 50 to 100 mm (max. axial offset $\pm 10$ mm)               |   |   |
|  | V600-H11<br>  | Stationary               | Flush-mounted in metal                      |                 | Irrelevant   |   | See note1.                                  |
|  |  |                          | Surface-mounted on metal                    |                 |  |   | 10 to 65 mm (max. axial offset $\pm 10$ mm) |
| Moving   |  | Flush-mounted in metal   | See note1.                                  |                 |  |   |   |
|  |  | Surface-mounted on metal | 30 to 65 mm (max. axial offset $\pm 10$ mm) |                 |  |   |   |
| V600-D2KR16<br>               | V600-H11<br> | Stationary               | Flush-mounted in metal                      | Irrelevant      |  | 2 to 15 mm (max. axial offset $\pm 10$ mm)<br>(See note 2.)   |   |
|  |  |                          | Surface-mounted on metal                    |                 |  | 2 to 15 mm (max. axial offset $\pm 10$ mm)  |   |
|  |  | Moving                   | Flush-mounted in metal                      |                 | 6 to 15 mm (max. axial offset $\pm 10$ mm)<br>See note 2.) |   |   |
|  |  |                          | Surface-mounted on metal                    |                 | 10 to 15 mm (max. axial offset $\pm 10$ mm)                |   |   |

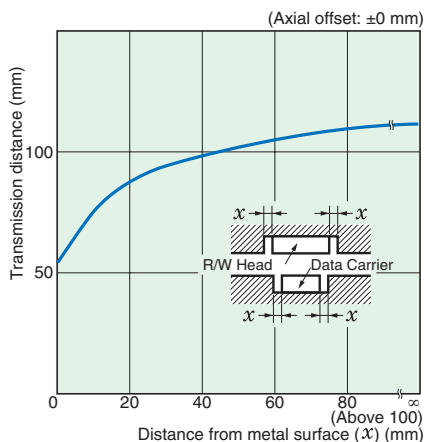
**Note: 1.** When Data Carriers are flush-mounted in metal, the read/write distance will depend on the distance (x) between the side of the DC and the metal surface.

**2.** Use the following method for flush mounting into a metallic base.

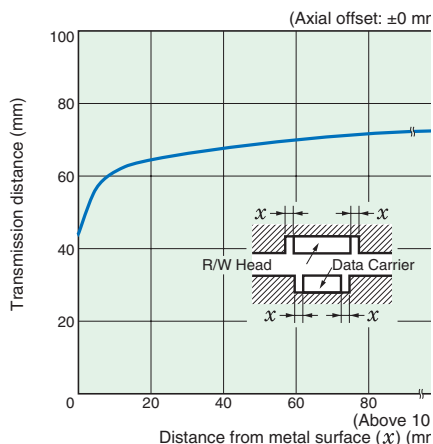
Refer to the *V600 R/W Heads and SRAM Data Carriers Operation Manual* (Cat. No. Z127) for details.



### Combined with V600-H07



### Combined with V600-H11



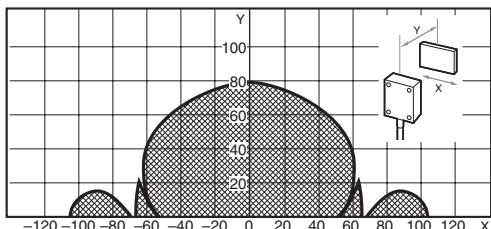
# Characteristic Data (Typical)

## Transmission Range

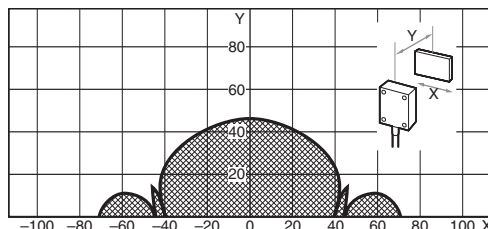
**Note:** The values shown in the following graphs are in millimeters. Refer to the previous six pages for details on Data Carrier and R/W Head mounting conditions.

### Battery-less Compact DCs

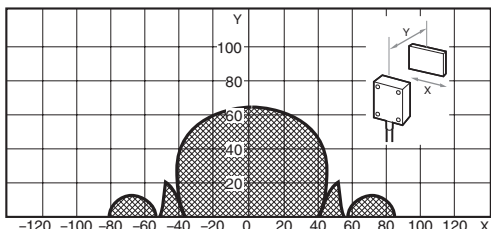
V600-D23P71 & V600-H07



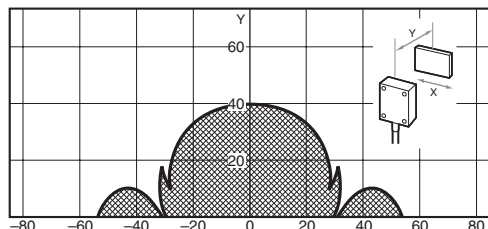
V600-D23P71 & V600-H11



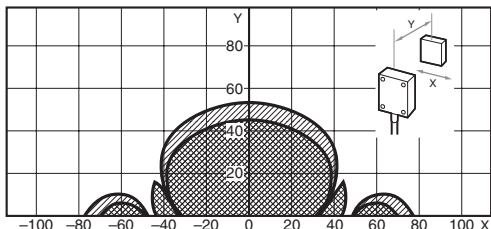
V600-D23P72 & V600-H07



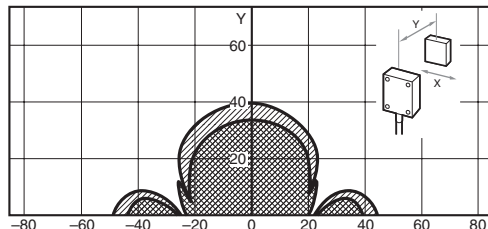
V600-D23P72 & V600-H11



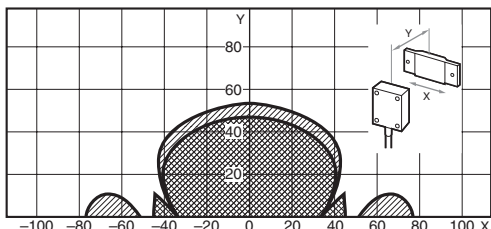
V600-D23P66N & V600-H07



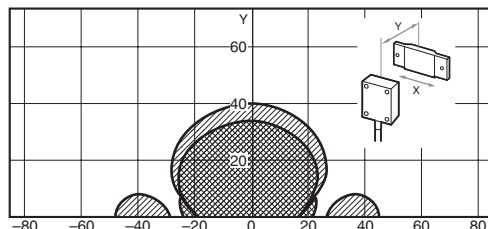
V600-D23P66N & V600-H11



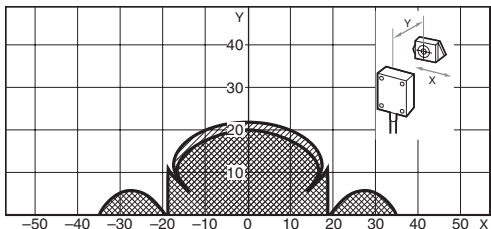
V600-D23P66SP & V600-H07



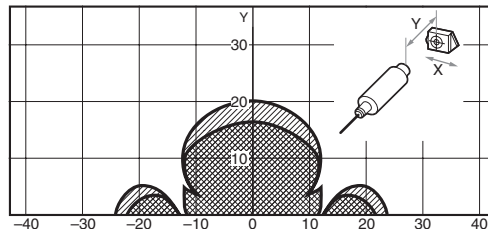
V600-D23P66SP & V600-H11



V600-D23P61 & V600-H11

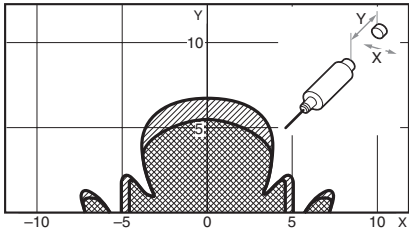


V600-D23P61 & V600-H51

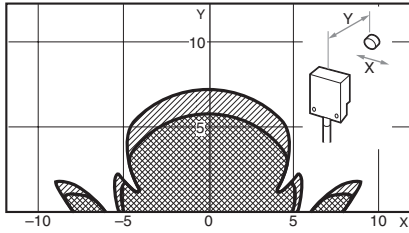


 Read range (in transmission distance priority mode)
  Write range (in transmission distance or transmission time priority mode)  
 Read range (in transmission time priority mode)

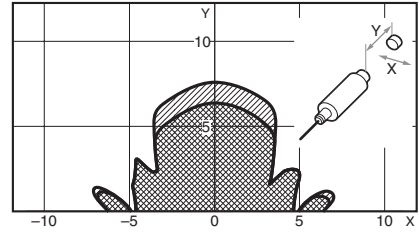
V600-D23P53 & V600-HS51  
+V600-HA51



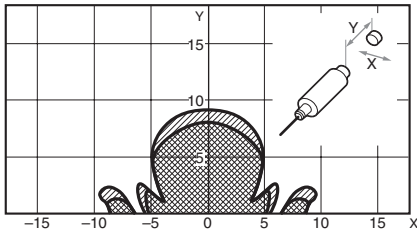
V600-D23P53 & V600-HS61  
+V600-HA51



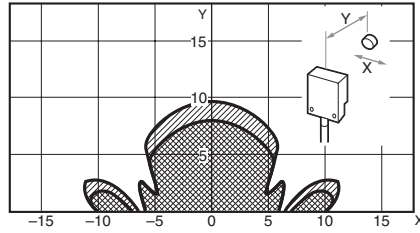
V600-D23P53 & V600-H52



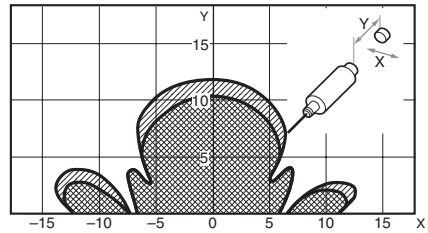
V600-D23P54 & V600-HS51  
+V600-HA51



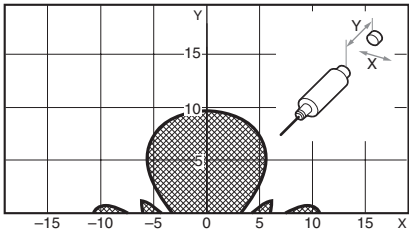
V600-D23P54 & V600-HS61  
+V600-HA51



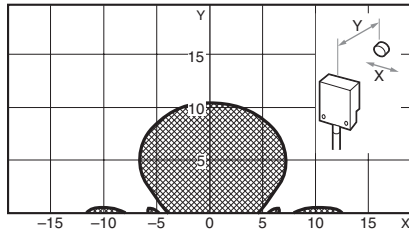
V600-D23P54 & V600-H52



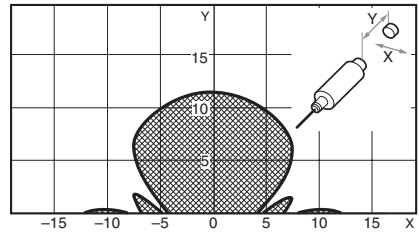
V600-D23P55 & V600-HS51  
+V600-HA51



V600-D23P55 & V600-HS61  
+V600-HA51



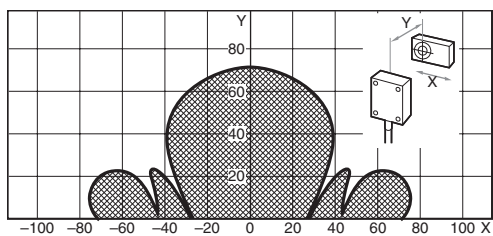
V600-D23P55 & V600-H52



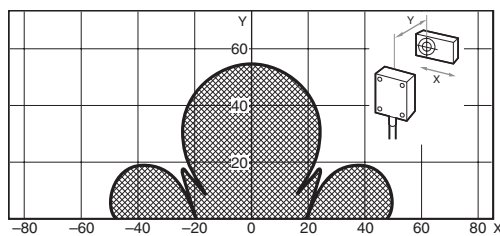
 Read range (in transmission distance priority mode)
  Write range (in transmission distance or transmission time priority mode)

## Built-in-Battery DCs

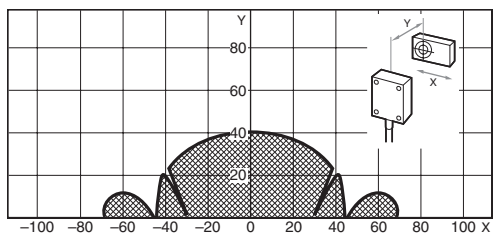
V600-D8KR12 & V600-H07



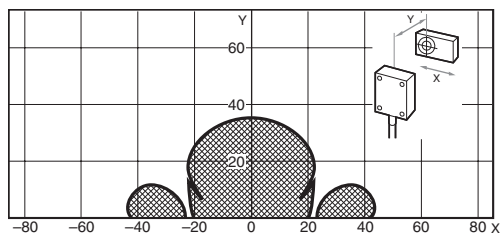
V600-D8KR12 & V600-H11



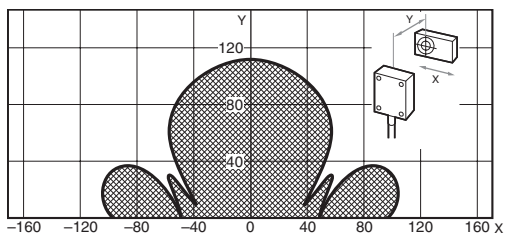
V600-D8KR13 & V600-H07



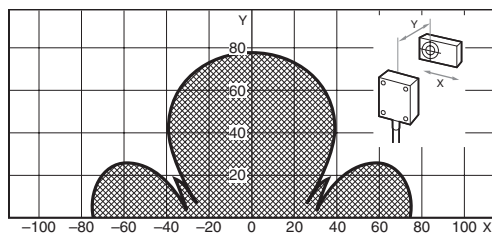
V600-D8KR13 & V600-H11



V600-D8KR04 & V600-H07

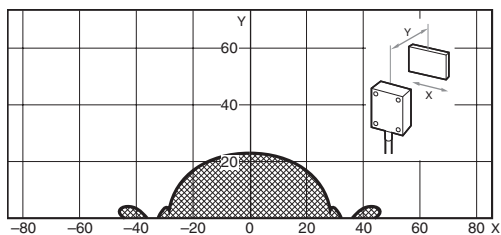



V600-D8KR04 & V600-H11



## Replaceable-Battery DCs

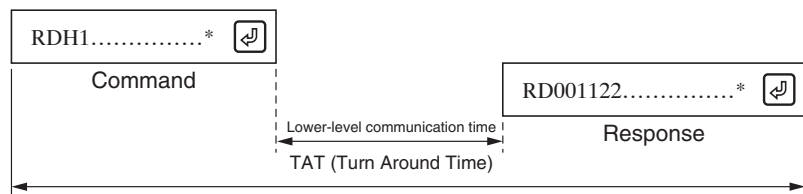
V600-D2KR15 & V600-H11



 Read/Write range (in transmission distance or transmission time priority mode)

## Transmission Time

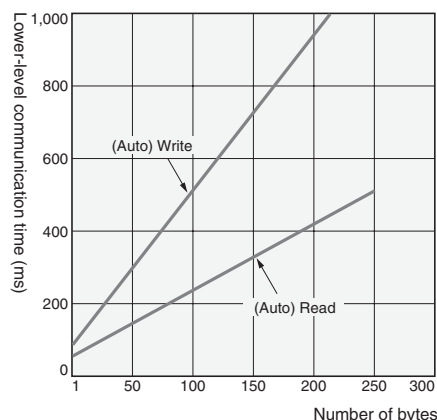
- The transmission time does not depend on the model of R/W Head or Data Carrier, although transmission times differ between Data Carriers with and without batteries.
- The turn around time (TAT) is the total time required from the issuance of a command from the host device (for example, a host computer) until the reception of a response.



- The lower-level communications time does not include the host communications; it is the time required for communications between the R/W Head and Data Carrier. The lower-level communications time is used in the equation for the DC speed.

$$\text{DC Speed} = (\text{Distance travelled in the transmission range}) / (\text{Lower-level communications time})$$

### Transmission Time with Built-in-Battery Data Carriers (Reference)

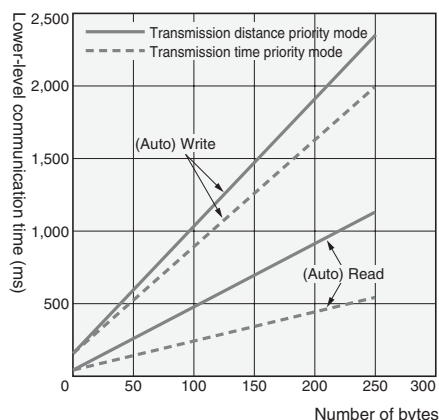


#### Calculation (Reference)

|       | Lower-level communications time (ms) |
|-------|--------------------------------------|
| READ  | $t = 1.8 N + 48.4$                   |
| WRITE | $t = 4.2 N + 86.5$                   |

N is the number of processing bytes.

### Transmission Time with Battery-less Data Carriers (Reference)



#### Calculation (Reference)

|                        | R/W   | Lower-level communications time (ms) |
|------------------------|-------|--------------------------------------|
| Distance priority mode | READ  | $t = 4.3 N + 64.6$                   |
|                        | WRITE | $t = 8.7 N + 167.1$                  |
| Time priority mode     | READ  | $t = 1.8 N + 79.0$                   |
|                        | WRITE | $t = 7.1 N + 180.4$                  |

N is the number of processing bytes.

## Lower-Level Communications Mode Setting (Distance/Time Priority)

The lower-level communications mode setting is made with a DIP Switch or memory switch on the Serial-interface Controller (V600-CA1A-□/-CA2A-□, V600-CD1D-V3, V600-CMID) or ID Sensor Unit. (Refer to the Controller's Operation Manual for more details on this setting.)

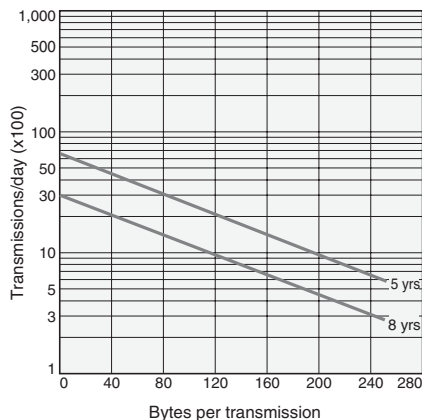
With Parallel-interface Controllers (V600-CA8A-V2/CA9A-V2) the mode is fixed to transmission distance priority.

## Battery Life

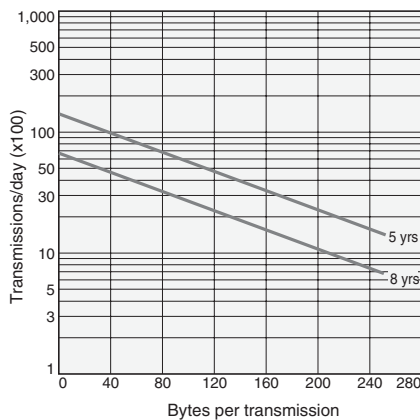
The Data Carrier has a built-in lithium battery.

The following graphs show the relationship between the number of bytes per transmission, the number of transmissions per day, and the battery life.

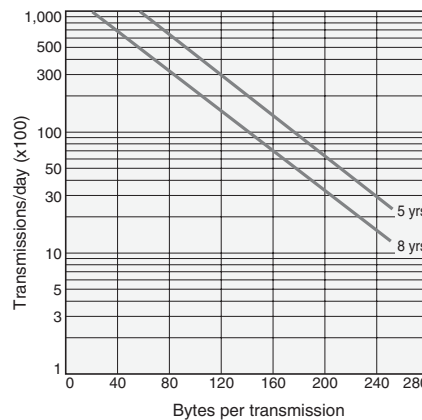
V600-D8KR12 (Typical Example)



V600-D8KR13 (Typical Example)



V600-D8KR04 (Typical Example)

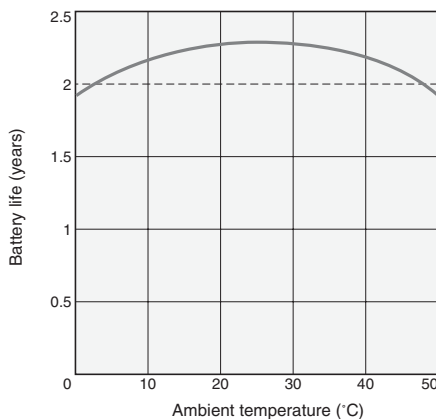


## Temperature and Battery Life

### V600-D2KR16

The battery life is two years at 25°C regardless of the relationship between the number of bytes read/written and the number of transmissions.

#### Examples Showing Relationship Between Battery Life and Temperature



The following table shows the standard values.

| Temperature | Battery consumption rate in one year |
|-------------|--------------------------------------|
| 20°C        | 1%                                   |
| 30°C        | 2%                                   |
| 40°C        | 4%                                   |
| 50°C        | 8%                                   |
| 60°C        | 16%                                  |
| 70°C        | 32%                                  |

**Note:** If the battery is stored at 70°C and is not installed, the battery life is calculated as follows:

$$2 \text{ (years)} \times (1 - 0.32) = 1.36 \text{ years}$$

If the battery is stored at 25°C after one year's storage, the battery life will be approximately 1 year and 4 months. (The battery life will be shortened if the battery is used at temperatures close to 0°C or 50°C.)

The values in the above graph are based on the battery being installed (i.e., the insulation sheet is removed). If the battery is not installed, the values shown in the above table will apply.

## Precautions

### Correct Use

#### Data Carrier Batteries

##### Built-in-Battery Data Carriers

**Caution**

Do not disassemble, deform by applying pressure, heat at temperatures exceeding 100°C, or burn. Doing so may cause the built-in lithium batteries to combust or explode.

##### Replaceable-Battery Data Carriers

**Caution**

Never short-circuit the positive and negative terminals of the batteries, charge the batteries, disassemble them, deform them, or throw them into a fire. Doing so may cause the batteries to explode, combust, or leak liquid.

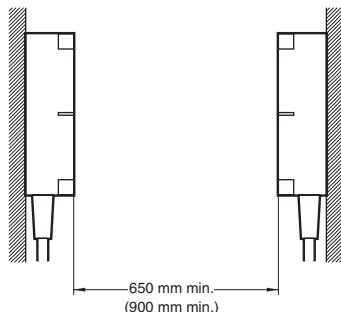
## ■ Mutual Interference

### Mutual Interference Between R/W Heads

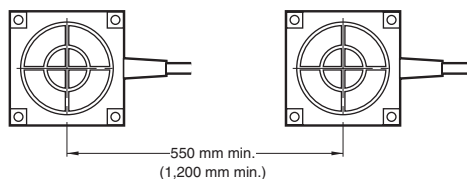
When using more than one set of R/W Heads, mutual interference between the Heads can be avoided by mounting the Heads at the specified distance as shown below.

#### V600-H07

- Facing  
RD/WT command: 650 mm min.  
Auto command: 900 mm min.

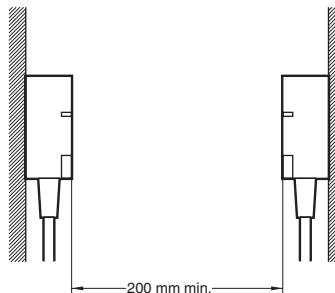


- Side-by-side  
RD/WT command: 550 mm min.  
Auto command: 1,200 mm min.

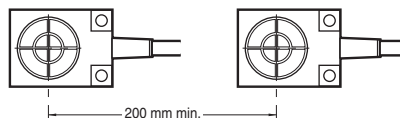


#### V600-H11

- Facing  
RD/WT command: 200 mm min.  
Auto command: 200 mm min.

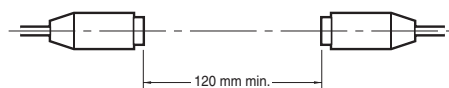


- Side-by-side  
RD/WT command: 200 mm min.  
Auto command: 200 mm min.

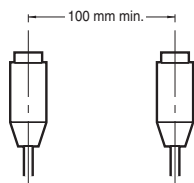


#### V600-H51

- Facing: 120 mm min.

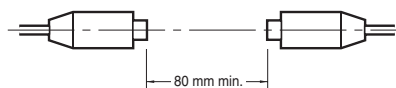


- Side-by-side: 100 mm min.

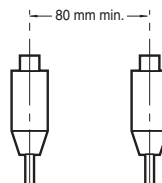


#### V600-H52

- Facing: 80 mm min.

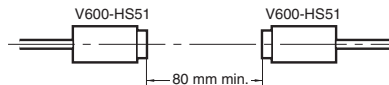


- Side-by-side: 80 mm min.

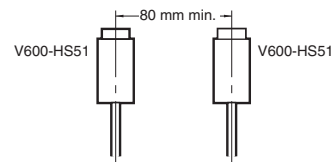


#### V600-HS51

- Facing: 80 mm min.

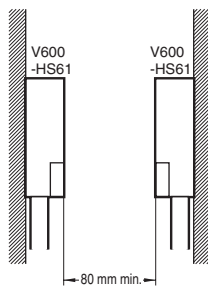


- Side-by-side: 80 mm min.

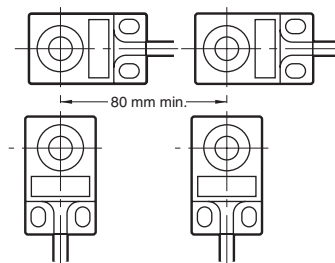


#### V600-HS61

- Facing: 80 mm min.



- Side-by-side: 80 mm min.



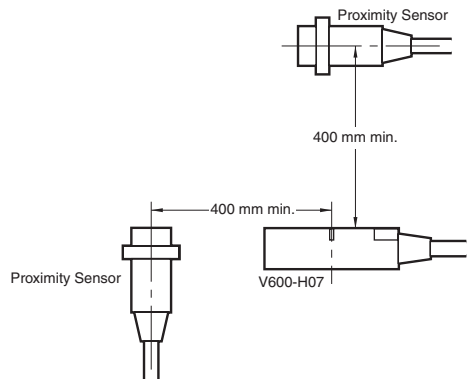
**Note:** If the two R/W Heads are not transmitting simultaneously (i.e., independent read/write), mutual interference will not occur. Therefore, the restriction on the distance between the Heads will not be applicable. The commands will be received by the R/W Heads and transmission will oscillate between them.

## Mutual Interference Between Proximity Sensors

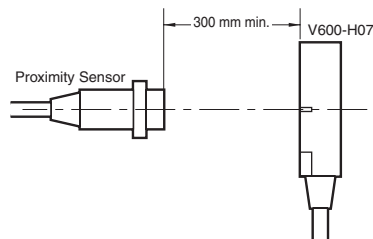
The V600-series Units use electromagnetic coupling (frequency: 530 kHz). When a V600 Unit is wired close to R/W Heads, Proximity Switches, and Sensors that have an oscillating frequency between 400 and 600 kHz, the Proximity Sensor may malfunction, so be sure to install the Units according to the distance restrictions specified in the following diagrams. Make sure to thoroughly test that the mounting positions and the fixed positions of the Sensors are correct before putting them into actual operation.

### V600-H07

- Vertical: 400 mm min.

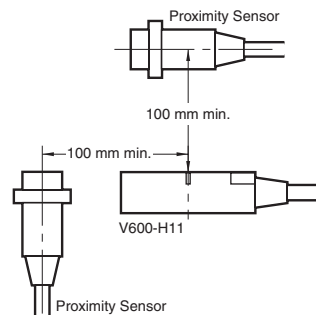


- Facing: 300 mm min.

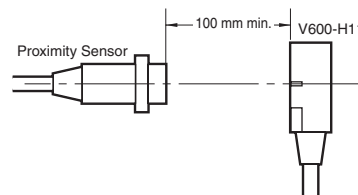


### V600-H11

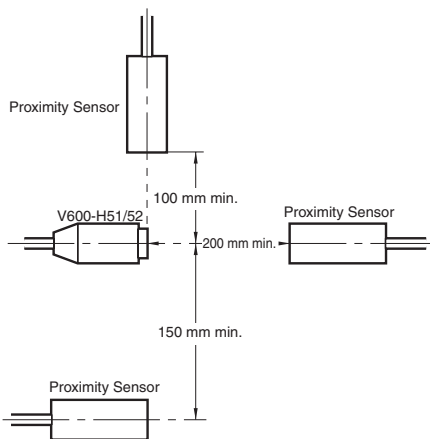
- Vertical: 100 mm min.



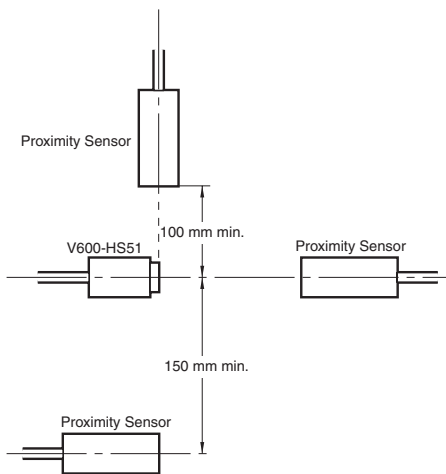
- Facing: 100 mm min.



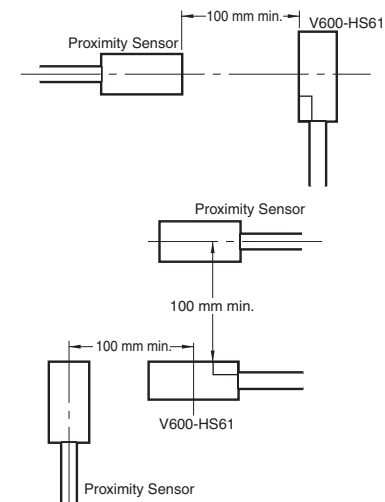
### V600-H51/H52



### V600-HS51



### V600-HS61





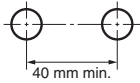
## Mutual Interference Between Data Carriers

When more than one Data Carrier is used, mutual interference between the DCs can be avoided by making sure that they are mounted apart at the distances specified below.

### (Reading/writing)

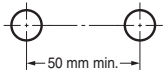
#### V600-D23P53

R/W Head: V600-H52, V500-HS51 + V600-HA51, V600-HS61 + V600-HA51



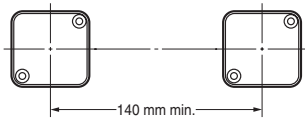
#### V600-D23P55

R/W Head: V600-H52, V600-HS51 + V600-HA51, V600-HS61 + V600-HA51

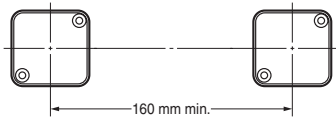


#### V600-D23P66N

R/W Head: V600-H11

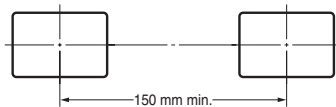


R/W Head: V600-H07

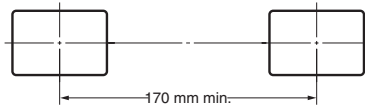


#### V600-D23P72

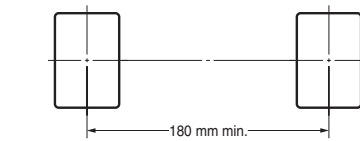
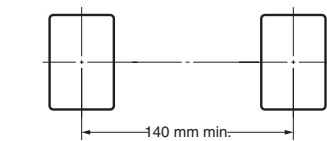
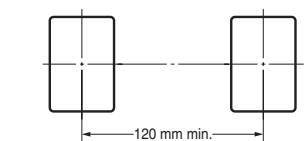
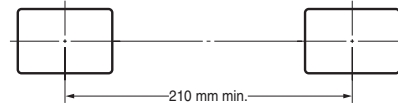
R/W Head: V600-H51



R/W Head: V600-H11

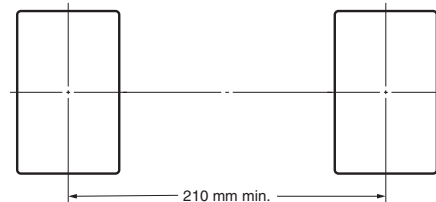
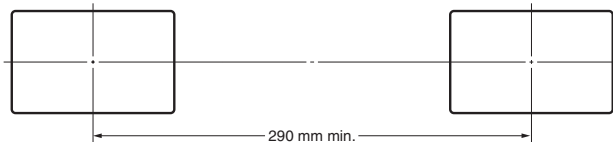


R/W Head: V600-H07



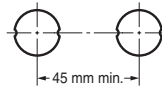
#### V600-D23P66SP

R/W Head: V600-H07



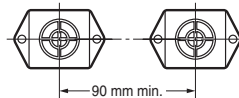
#### V600-D23P54

R/W Head: V600-H52, V600-HS51 + V600-HA51, V600-HS61 + V600-HA51



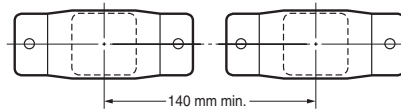
#### V600-D23P61

R/W Head: V600-H11/-H51

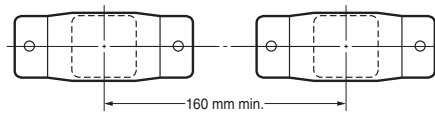


#### V600-D23P66SP

R/W Head: V600-H11

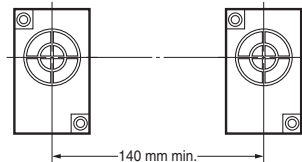
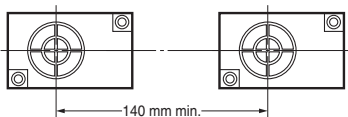


R/W Head: 600-H07



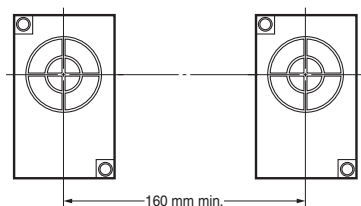
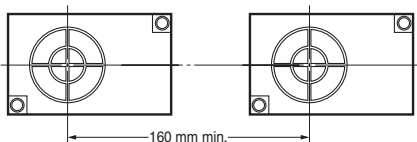
**V600-D8KR12**

R/W Head: V600-H11



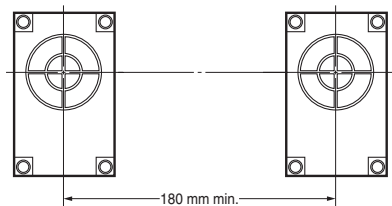
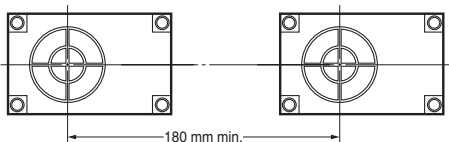
**V600-D8KR13**

R/W Head: V600-H11



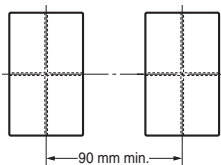
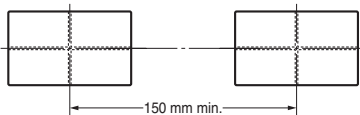
**V600-D8KR04**

R/W Head: V600-H11

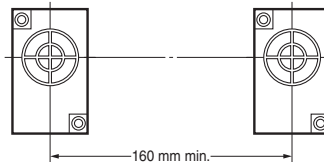
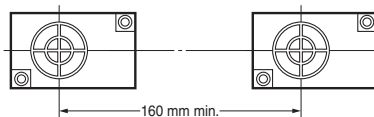


**V600-D2KR16**

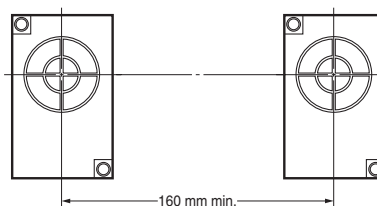
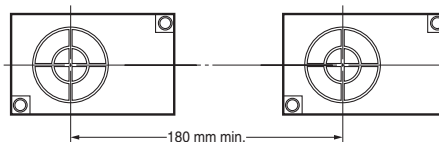
R/W Head: V600-H11



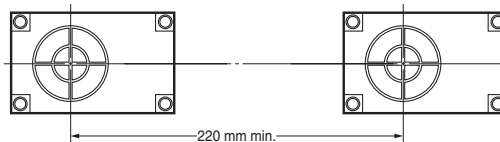
R/W Head: V600-H07



R/W Head: V600-H07



R/W Head: V600-H07



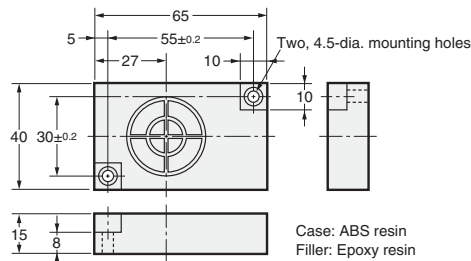
# Dimensions

Note: All units are in millimeters unless otherwise indicated.

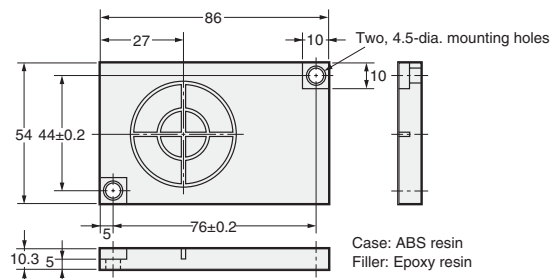
## Data Carriers

### Built-in-Battery DCs

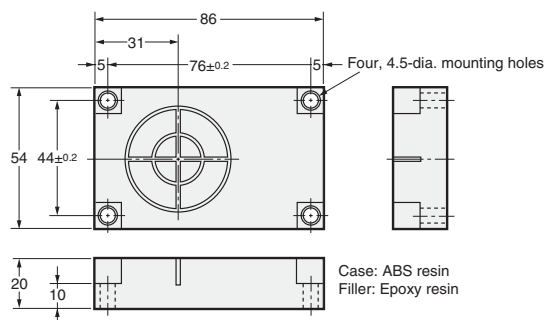
#### V600-D8KR12



#### V600-D8KR13

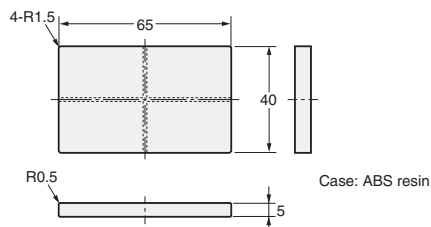


#### V600-D8KR04



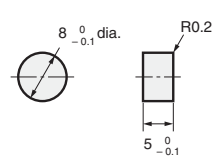
### Replaceable-Battery DCs

#### V600-D2KR16



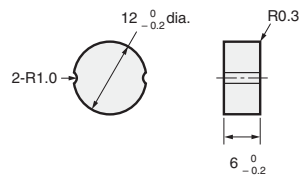
### Battery-less DCs

#### V600-D23P53



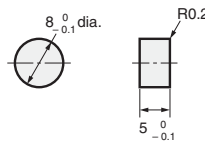
Case: ABS resin  
Filler: Epoxy resin

#### V600-D23P54



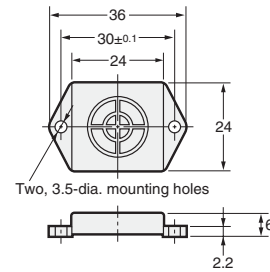
Case: ABS resin  
Filler: Epoxy resin

#### V600-D23P55



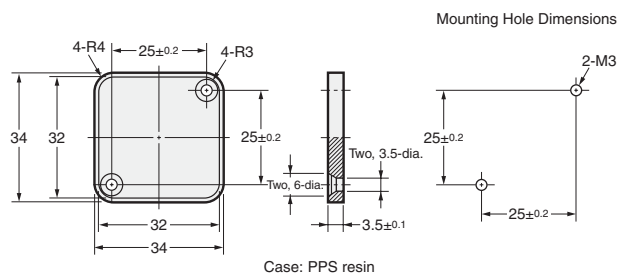
Case: PPS resin  
Filler: Epoxy resin

#### V600-D23P61

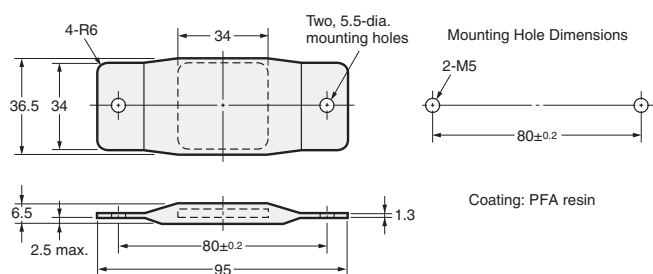


Case: ABS resin  
Filler: Epoxy resin

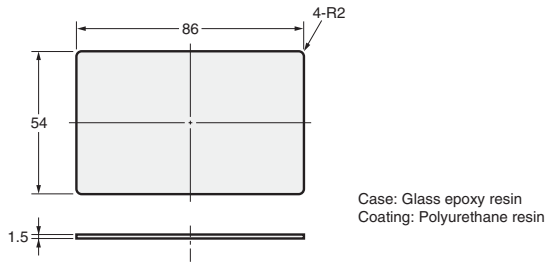
#### V600-D23P66N



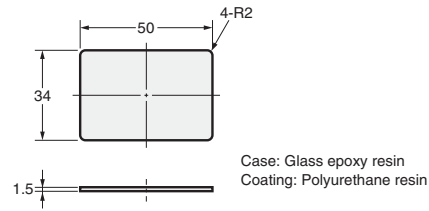
#### V600-D23P66SP



V600-D23P71

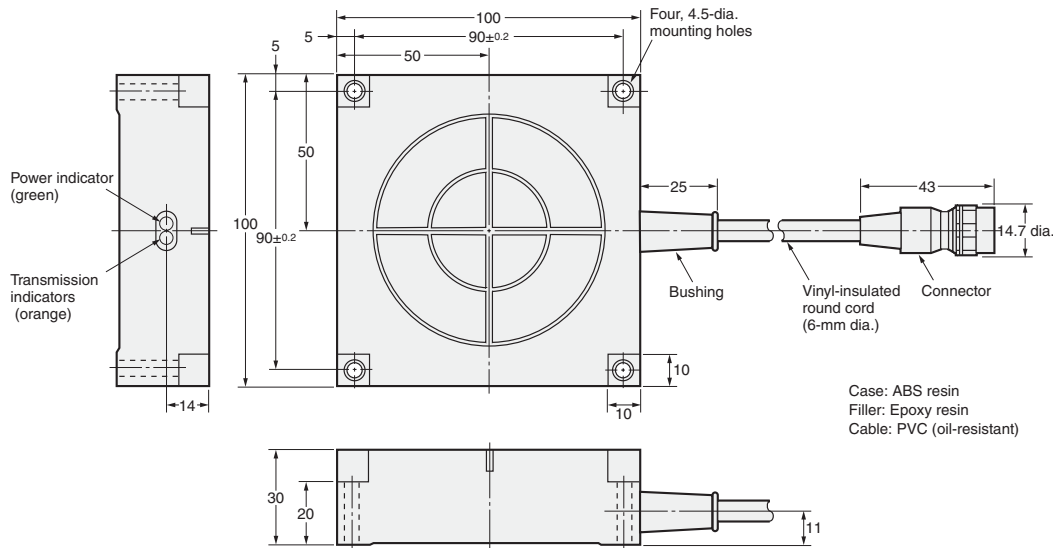


V600-D23P72

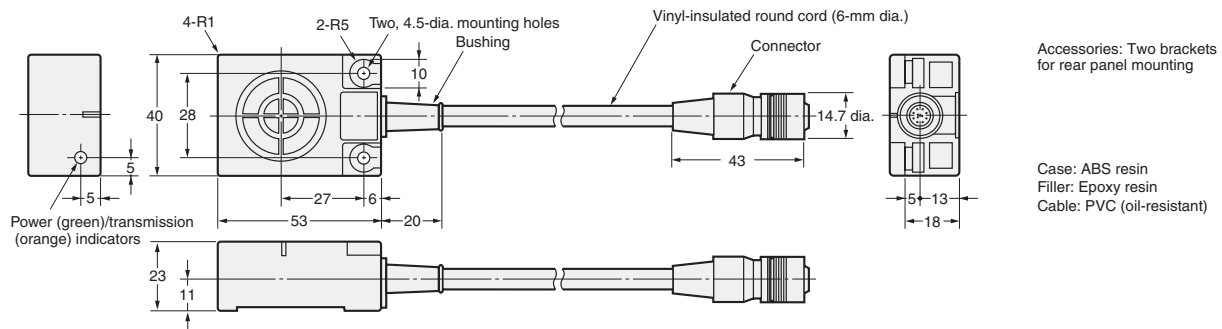


R/W Heads

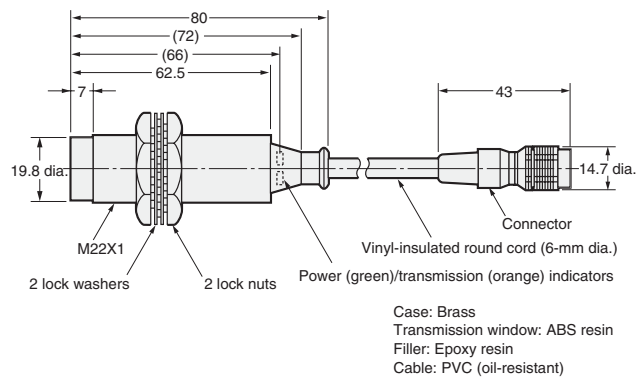
V600-H07



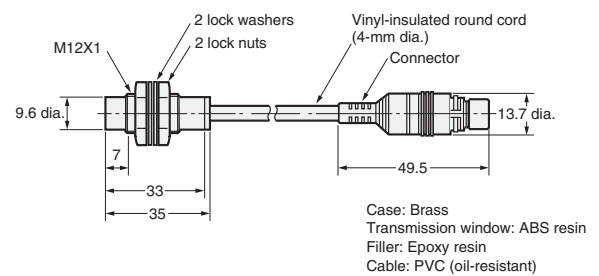
V600-H11



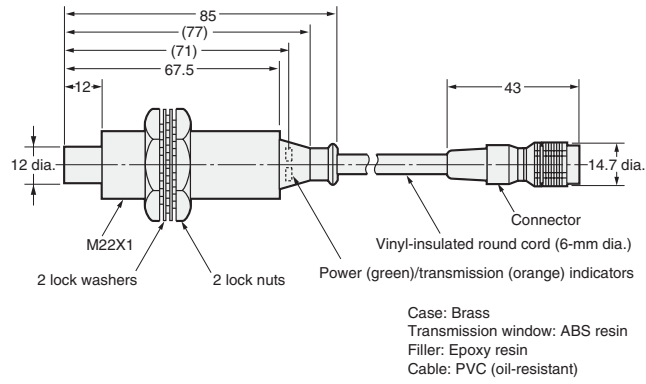
V600-H51



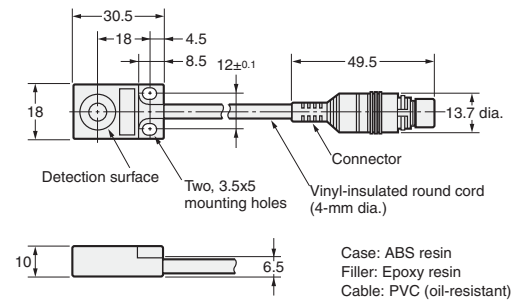
V600-HS51 (Sensor Section)



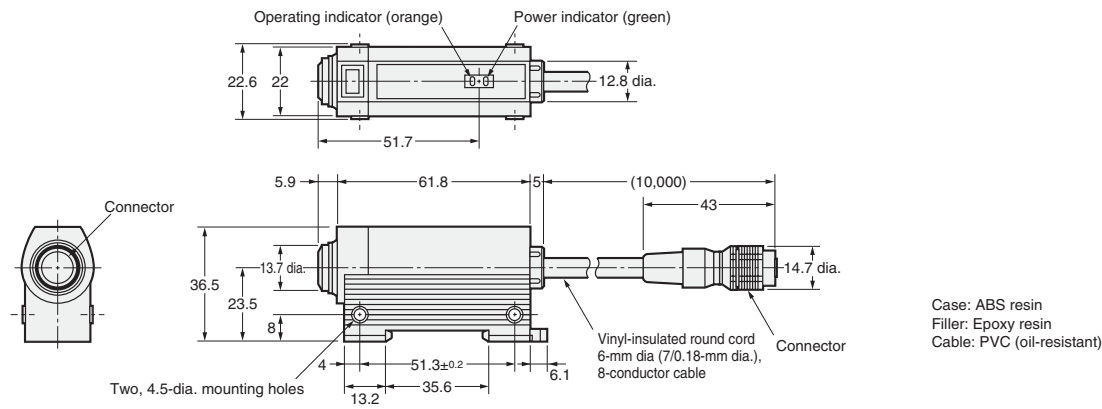
**V600-H52**



**V600-HS61 (Sensor Section)**

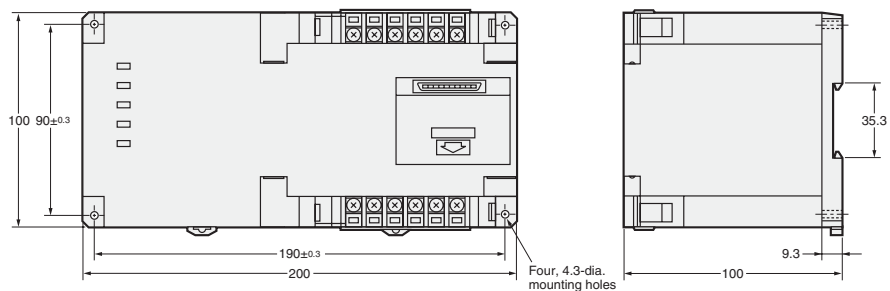


**V600-HA51 (Amplifier Section)**

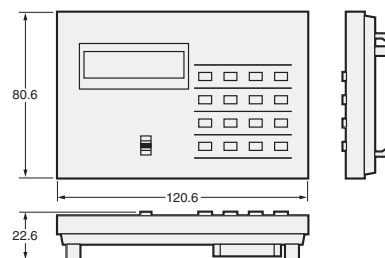


## ID Controllers

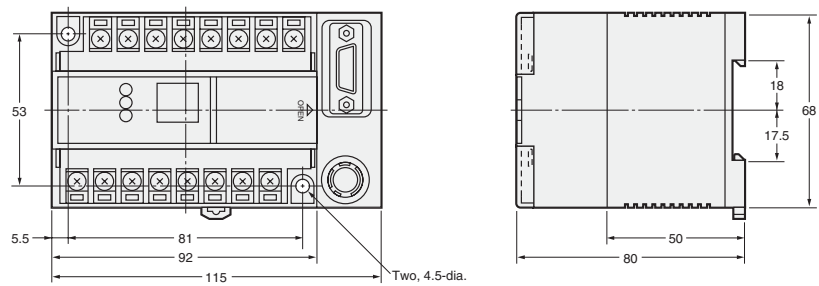
**V600-CA□A-□ (Multi-purpose)**



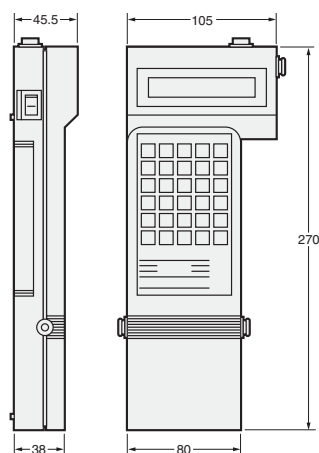
**V600-P01 Monitor Unit  
(For use with V600-CA□A-□)**



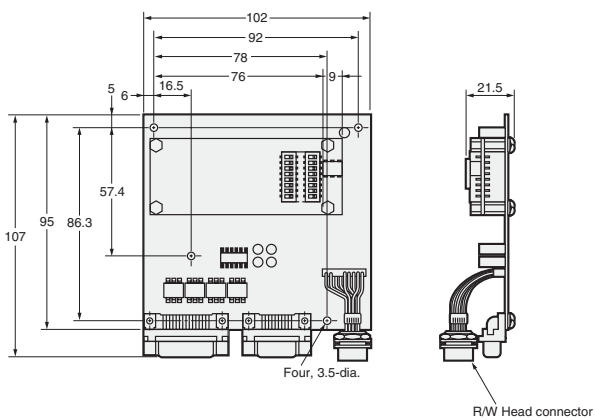
**V600-CD1D-V3 (Compact)**



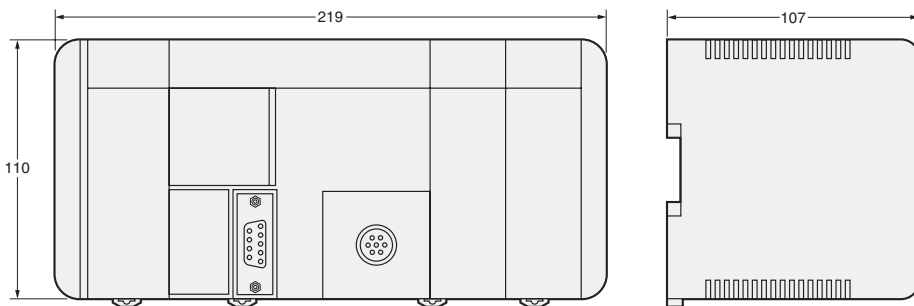
**V600-CB-US Handheld  
ID Controller**



**V600-CM1D (Board-Mounted)**

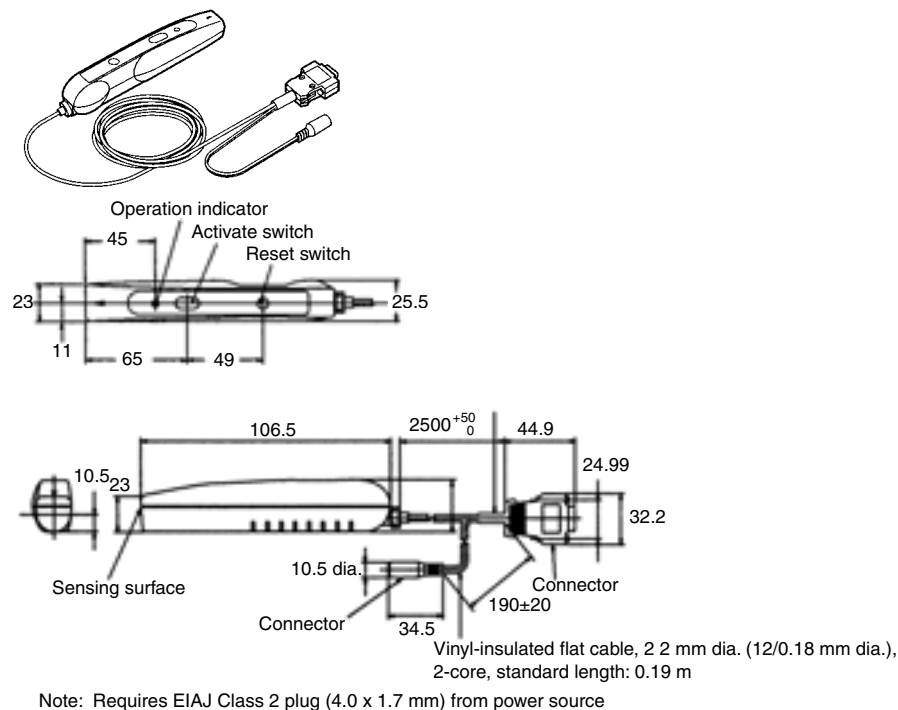


**IDSC-C1D□-A (Stand-alone)**



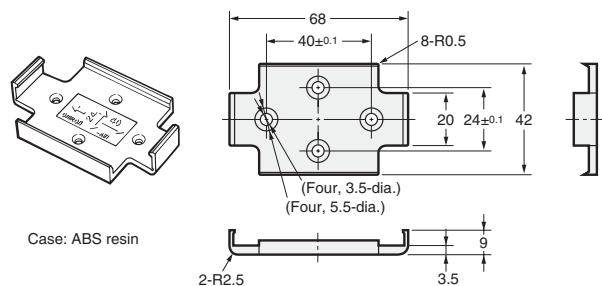
## Accessories

### V600-CH1D Handheld Reader/Writer

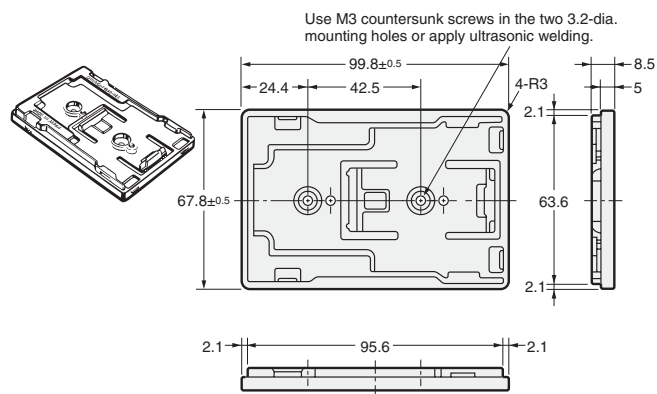


## Holder

### V600-A81 for V600-D2KR16 Data Carriers

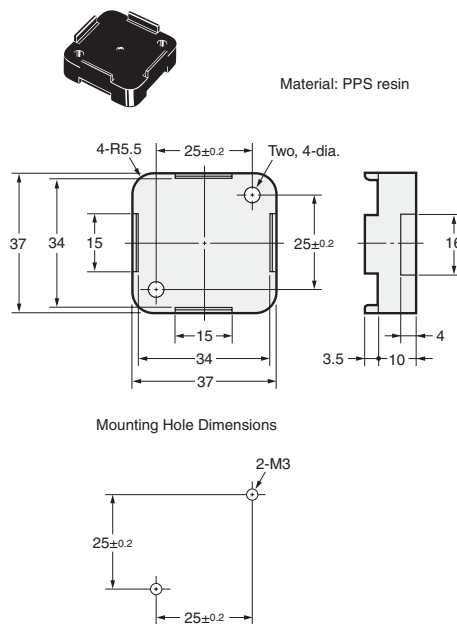


### V600-A84 for V600-D23P71/-D23P72 Data Carriers



## Attachment

### V600-A86 for V600-D23P66N Data Carriers



ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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- Systems, machines and equipment that could present a risk to life or property.

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ALL DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters into inches, divide by 25.4

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