

Product Lineup
Product Variations
System Configuration

**V600 Series Electromagnetic
Coupling Systems (530 kHz)**

V600 RFID System
Handheld Reader/Writer
(V600-CH1D)
ID Sensor Modules for CJ1 and
CS1 PLCs
Intelligent Flags I and II
(V600-HA Series)
Intelligent Flag III with DeviceNet
(V600-HAM42-DRT)

**V670 Series High-speed
Inductive System (13.56 MHz)**

V670 RFID System

**V700 Series Inductive Systems
(125 kHz)**

V700 RFID System
CIDRW System for Semiconductor
Industry

Applications

Industrial RFID

**2-D & Linear
Bar Code Readers**

Asset Management RFID

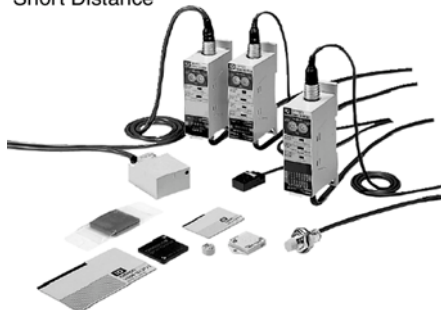
Reference Information

Product Lineup

Non-contact data communication that fuses information to the physical world.

■ Product Features and Configuration

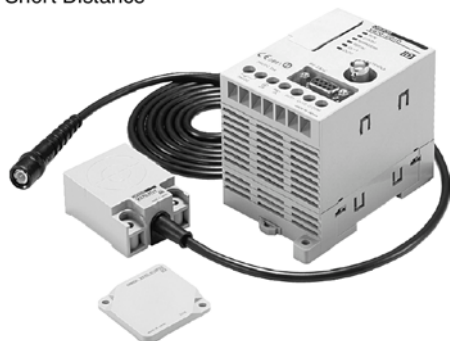
Short Distance



V600 Electromagnetic Coupling RFID System

- Short-distance system with maximum transmission distance of 100 mm.
- Lineup includes Built-in-battery Data Carriers (8 kbytes) and Battery-less Data Carriers (256 bytes).
- The reusable Data Carriers are thin, compact, and economical.
- The system offers high resistance to the environment, noise, and heat: models resistant to temperatures of up to 150°C are available.
- Lineup also includes Intelligent Flag Series that handles mechanical flag and Kanban applications.
- DeviceNet compatibility is also available with the Intelligent Flag III System.
- Direct connection to an Omron PLC bus is possible using the ID Sensor Module.
- Compact, lightweight Handheld Reader/Writer.

Short Distance



V670 Electromagnetic Inductive System

- High-speed communications requiring only 14 ms to read or write 128 bytes of data.
- Long-life battery-free Data Carriers to read and write data 1,000 million times.
- Versatile functions, such as auto repeat, repeat input trigger, and tag specification.
- Self-execution mode for data processing with no host controller intervention.

Medium Distance



V700 Electromagnetic Inductive System

- A medium transmission distance of 250 mm max. and a wide transmission range of 500 mm.
- Equipped with multiple access function to enable reading and writing for several ID Tags in the Antenna's transmission range.
- Easy-to-use, reasonably-priced ID Tags for applications using a large number of Tags.
- The series includes a Link Unit and a Compact Reader/Writer to allow simultaneous control for several Antennas.

■ Comparison of RFID Systems

Item	System type		
	Electromagnetic	Electromagnetic inductive	
Series name	V600	V670	V700
Transmission frequency	530 kHz	13.56 MHz	125 kHz
Base standard (standardization)	---	ISO 14443	---
Transmission distance	0 to 100 mm	0 to 30 mm	0 to 250 mm
Unification of objects and data	Optimal	Optimal	Optimal
Control from computer or PLC	Optimal	Optimal	Optimal
Data writing	Optimal	Optimal	Optimal
Tag life	Optimal	Optimal	Sufficient
Baud rate	10 kbps	210 kbps	7 kbps
Resistance to influence of reflection/interference	Optimal	Sufficient	Sufficient
Stable transmission at FA production site	Optimal	Optimal	Sufficient
Electromagnetic field noise immunity	Optimal	Optimal	Sufficient
Resistance to influence of wireless LAN and transportation	Optimal	Optimal	Optimal
Resistance to optical noise	Optimal	Optimal	Optimal
Resistance to oil and water	Optimal	Sufficient	Optimal
Resistance to influence of moisture	Optimal	Sufficient	Optimal
Resistance to heat	Optimal	Sufficient in some cases	Optimal
Transmission through glass or resin (shielding)	Optimal	Sufficient	Optimal
Conformance with Japanese regulations on electromagnetic waves and safety	Optimal	Sufficient	Sufficient
Conformance with international regulations on electromagnetic waves and safety	Sufficient	Optimal	Optimal
Peripheral device lineup	Optimal	Sufficient in some cases	Sufficient
Price	Reasonable	Reasonable	Economical

■ Features and Products

Feature/product	Series		
	V600	V670	V700
Resistance to influence of superficial dirt	Optimal	Optimal	Optimal
FIFO (first in first out) function	---	Optimal	Optimal
Multiple access function	---	---	Optimal
Selective access function	---	Optimal	Optimal
Controller that can be incorporated in PLC	Optimal	---	---
Antenna that can be mounted on metal surface	Optimal	Optimal	Optimal
Antenna equipped with controller functions	Optimal	---	Optimal
Handheld terminal/antenna	Optimal	---	Optimal
Miniature antenna	Optimal	---	---
Compact antenna	Optimal	Optimal	Optimal
Medium-size to large antenna	Sufficient	---	Optimal
Tags that can be mounted on metal surface	Optimal	---	Sufficient
Miniature tags	Optimal	---	Sufficient
Compact tags	Optimal	Sufficient	Optimal
Water-resistant tags	Optimal	Optimal	Optimal
Chemical-resistant tags	Optimal	---	Optimal
Battery-less tags	Optimal	Optimal	Optimal
Large-capacity tags	Optimal	---	---
Tags allowing more than 100,000 overwrites	Optimal	Optimal	---

Product Variations

■ V600 Series

V600 Built-in-battery Data Carriers



Large-capacity V600 Tags

- Maximum transmission distance: 100 mm
- Mounts to metal surfaces.
- Flush-mounts in metal bases.
- Medium-size.
- Water-resistant.
- Oil-resistant.
- Large capacity.
- Unlimited number of overwrites.

V600 Rectangular R/W Heads



Flexible Transmission Distance

- Maximum transmission distance: 100 mm
- Mounts to metal surfaces.
- Medium-size model.
- Compact model.
- Water-resistant.
- Oil-resistant.

V600 Battery-less Data Carriers



Flexible Lineup for a Variety of Applications

- Maximum transmission distance: 70 mm.
- Mounts to metal surfaces.
- Flush-mounts in metal bases.
- Medium-size model.
- Compact model.
- Miniature model.
- Oil-resistant.
- Chemical-resistant.
- Storage at high temperatures.
- Storage at very high temperatures.
- Battery-less.
- Number of overwrites: 100,000 times.

V600 Round R/W Heads



Easy Mounting on Metal Surfaces

- Maximum transmission distance: 30 mm
- Mounts to metal surfaces.
- Flush-mounts in metal bases.
- Compact model.
- Miniature model.
- Water-resistant.
- Oil-resistant.

V600 Separate-amplifier R/W Head



Miniature Design Allows Mounting Almost Anywhere

- Maximum transmission distance: 100 mm
- Mounts to metal surfaces.
- Flush-mounts in metal bases.
- Separate amplifier and sensor.
- Miniature.
- Water-resistant.
- Oil-resistant.

V600 AC-type ID Controller



Offering a Variety of Host Interfaces

- Medium-size.
- Connects to Monitor Unit.
- Supports connection of several R/W Heads.
- AC power supply.
- RS-232C.
- RS-485.

V600 Handheld ID Controller



Enabling Portable Operation

- Medium-size
- Handheld
- Rechargeable model
- Battery-powered model
- AC adapter

V600 Wand (V600-CH1D)



Read/Write Head Combined with an ID Controller

- Connects directly to a PC or PLC via RS-232C.
- Protective construction of the main unit is IP63 (IEC standard) for outdoor applications.
- Compatible with V600-series Data carriers connected to existing systems.
- Reads and writes Data Carrier data.
- Special commands allow the Reader/Writer to read and write data within the Data Carrier across several regions at once.
- Data transmissions are activated by using commands from the main unit or by using a switch on the Reader/Writer.

V600 DC-type ID Controller



Low-Cost DC Version

- Compact.
- Board-type
- Connects to Monitor Unit.
- DC power supply.
- RS-232C.

V600 ID Controller for Incorporating in PLC



Ideal for Connection to OMRON PLCs

- Supports connection of several R/W Heads.
- Power supplied from PLC.
- DC power supply.
- Available for CJ1 PLCs.
- Available for CS1 PLCs.
- Available for C200H, C500, C1000H, and C2000H.

V600 Intelligent Flag Series



Innovative Electronic Flags to Replace Mechanical Flags

- Compact
- DC power supply
- Open collector output
- DeviceNet interface

Sensor

- Maximum transmission distance: 100 mm.
- Mounts to metal surfaces.
- Flush-mounts in metal bases.
- Medium-size model.
- Compact model.
- Miniature model.
- Oil-resistant.
- Water-resistant.

■ V670 Series

V670 Tags



High-Speed, Long-life V670 Tags

- Maximum transmission distance: 23 mm.
- Compact.
- Water-resistant.
- Number of accesses: 1,000 million times.
- Battery-less.

V670 Antenna



Ideal for High-Speed Production and Conveyance Lines

- Maximum transmission distance: 23 mm.
- Mounts to metal surfaces.
- Compact.
- Water-resistant.
- High-speed transmission.

V670 Controller



Operation Possible without Host Controller

- Compact.
- Self-execution mode.
- Supports connection to Programming Console.
- DC power supply.
- RS-232C.

■ V700 Series

V700 ID Tags



Ideal for Applications Using a Large Number of Tags

- Maximum transmission distance: 250 mm
- Mounts to metal surfaces (using a holder).
- Compact model.
- Miniature model.
- Storage at high temperatures.
- Storage at very high temperatures.
- Water-resistant.
- Oil-resistant.
- Chemical-resistant.
- Number of overwrites: 100,000 times.
- Battery-less.

V700 Antenna



Wide Transmission Range

- Maximum transmission distance: 250 mm.
- Large model.
- Very large model.
- Transmission for multiple tags.

V700 Controller



Compatible with Two Types of Host Interface

- Compact.
- Programming Console.
- Noise measurement function.
- DC power supply.
- RS-232C.
- RS-485.

V700 for Semiconductor Industry



Special Lineup for the Semiconductor Industry

- Transmission range conforms to SEMI standards.
- Tags cleaned with purified water.
- Installation dimensions conform to SEMI standards.
- Compatible with SECS protocol.

V700 Compact Reader/Writer

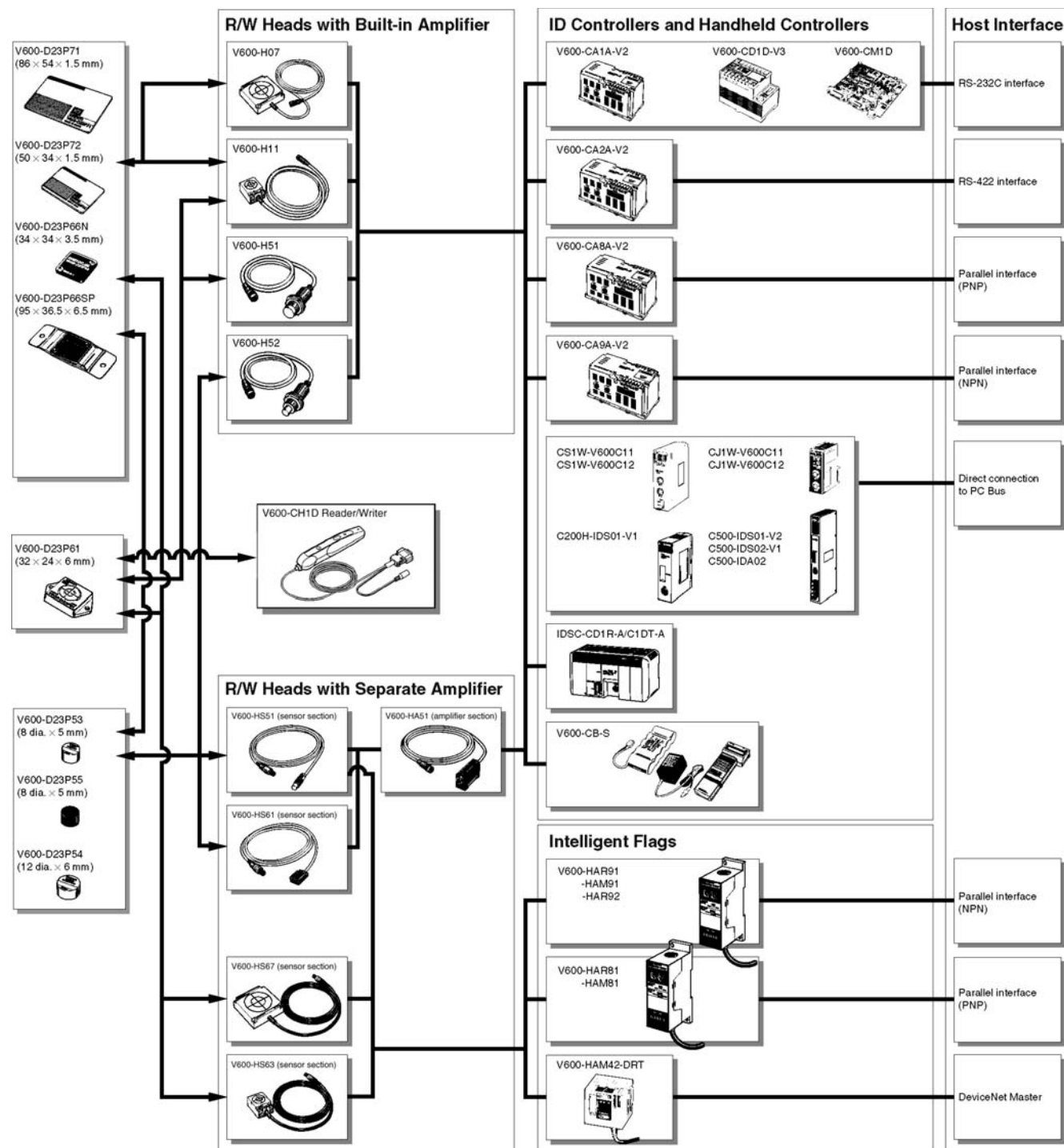


Compact, Low-Cost Reader/Writer

- Maximum transmission distance: 43 mm.
- Mounts to metal surfaces.
- Compact.
- Water-resistant.
- Oil-resistant.
- Built-in controller.
- AC adapter.
- DC-type Interface Conversion Unit.
- RS-232C.

System Configuration

■ V600 Battery-less Data Carriers



Note: 1. There are restrictions for the following Controllers when using EEPROM (battery-less).

Data Carriers:

V600-CA□A: Software version 5.0 or higher

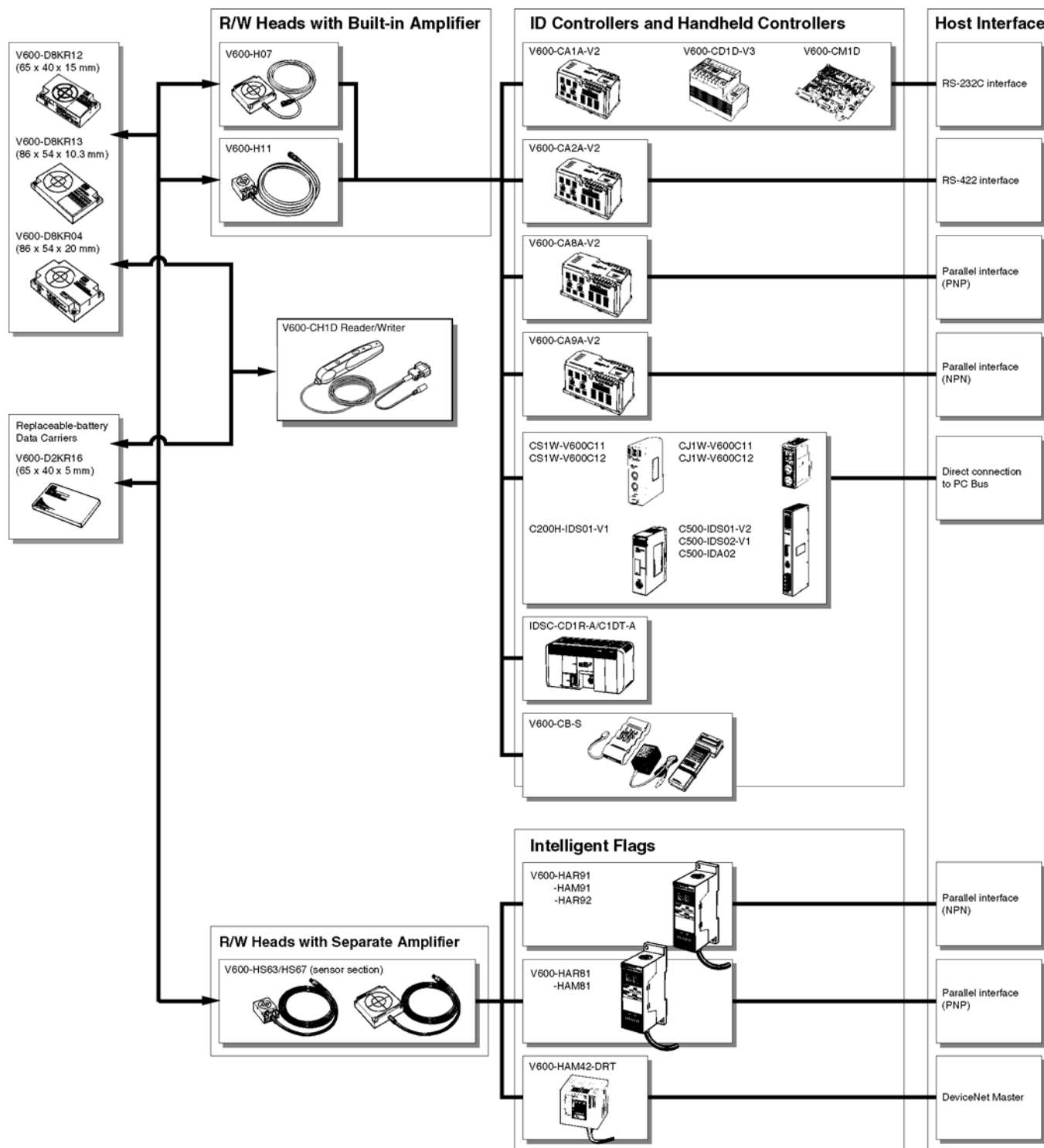
V600-CD1D/CM1D: Software version 2.0 or higher

V600-CB: Software version 2.0 or higher

ID Sensor Unit: V1 or higher for C200H-IDS01 or C500-IDS02 and V2 for C500-IDS01.

2. There is no compatibility between V600, V670, and V700 products.

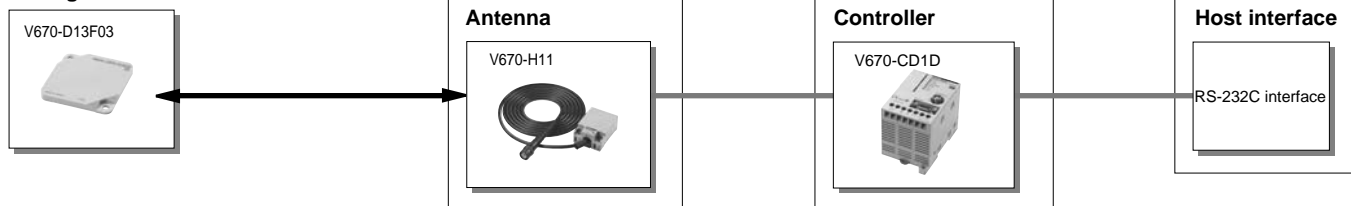
■ V600 Built-in-battery Data Carriers



Note: There is no compatibility between V600, V670, and V700 products.

■ V670 Series

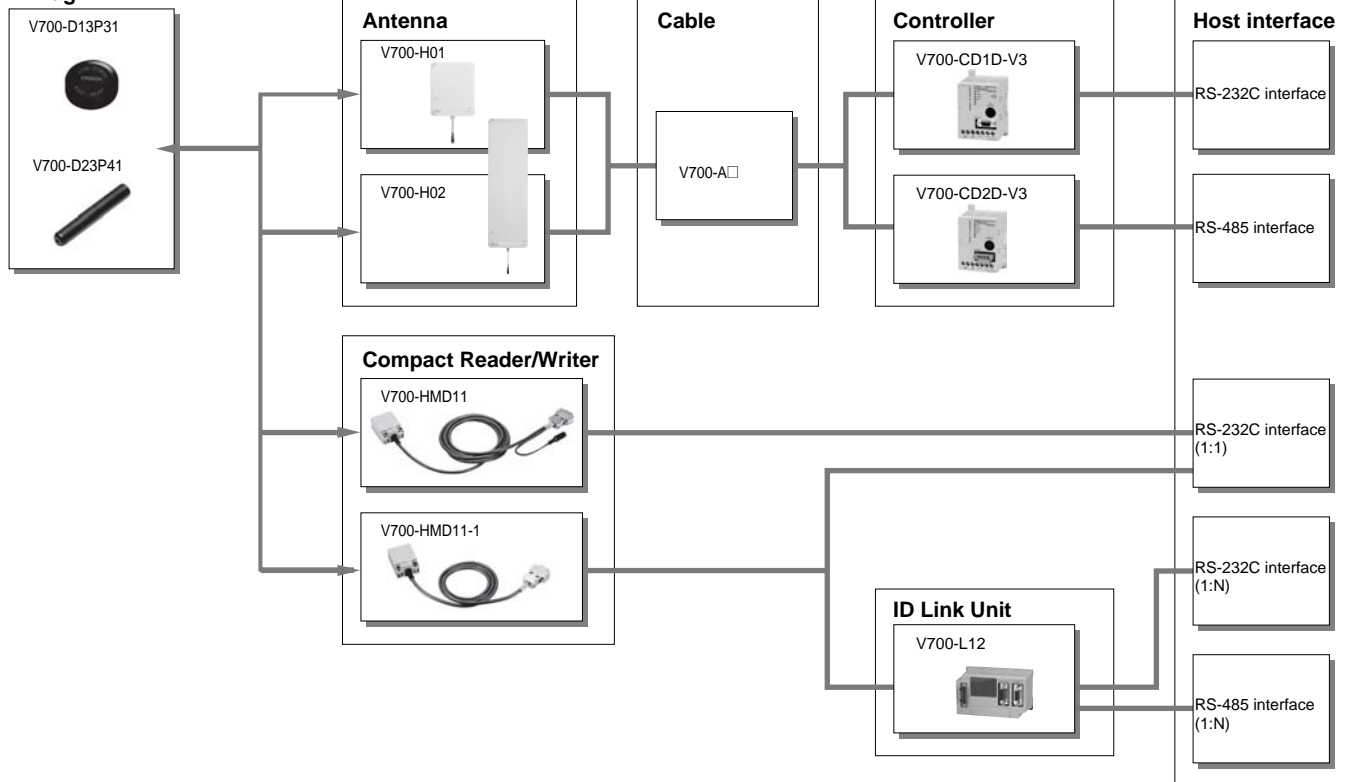
ID Tag



Note: There is no compatibility between V600, V670, and V700 products.

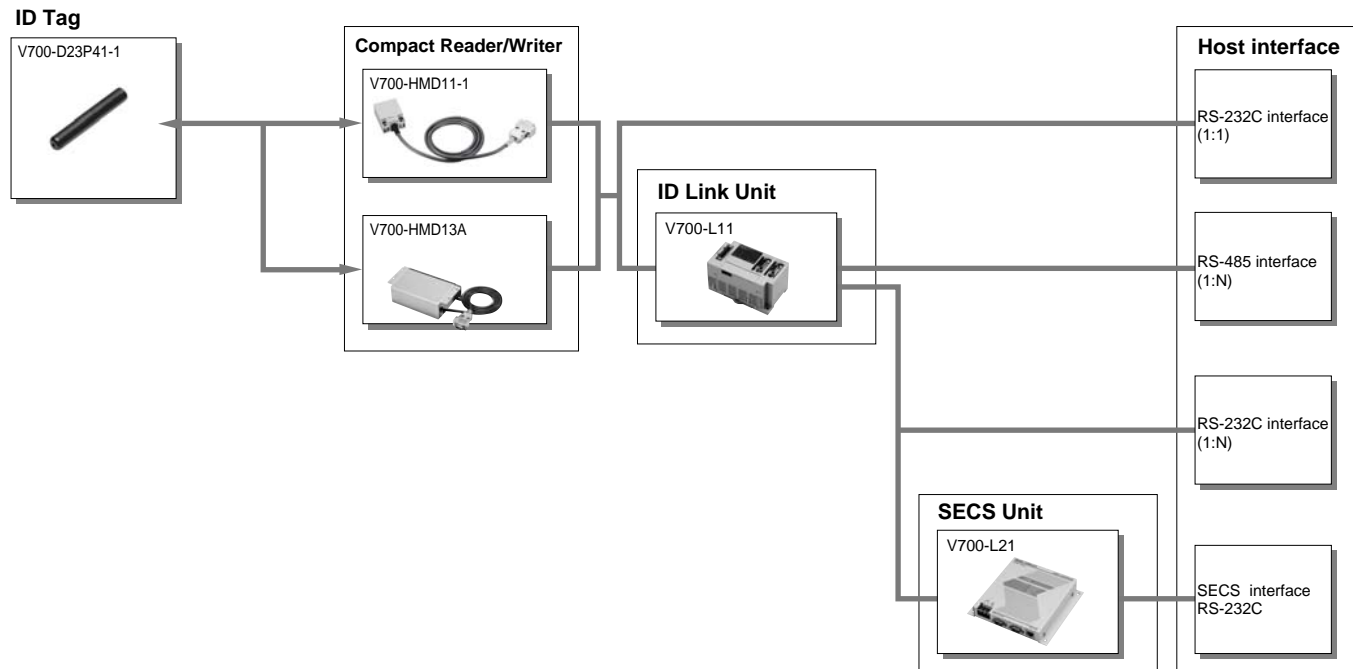
■ V700 Series

ID Tag



Note: There is no compatibility between V600, V670, and V700 products.

■ V700 for Semiconductor Industry



Note: There is no compatibility between V600, V670, and V700 products.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

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

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

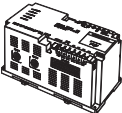

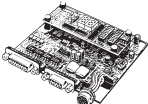



■ Data Carriers

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



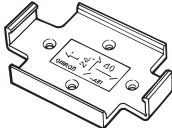
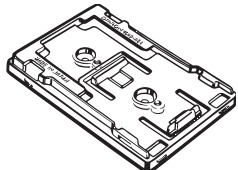
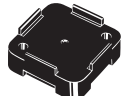

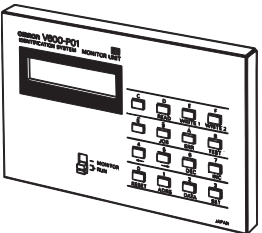
■ R/W Heads

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)		
			10-m cable		V600-H11 (10 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		
							

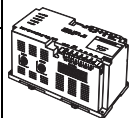
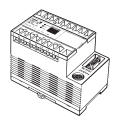
■ ID Controllers

Item	Specifications/Design		Model	
AC Power Supply	100 to 240 VAC, 50/60 Hz Two R/W Head connectors 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 R/W Head connectors 115 × 68 × 80 mm	RS-232C host interface		V600-CD1D-V3
	24-VDC, 5-VDC 2-system input R/W Head connectors Board type			V600-CM1D
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 Relay contact output type		IDSC-C1DR-A	
	150 to 240 VAC, 50/60 Hz Transistor output type		IDSC-C1DT-A	
Handheld Reader/Writer	RS-232C Host Interface; use V600-A20 power pack.			V600-CH1D

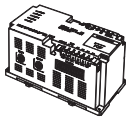
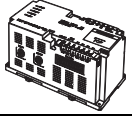
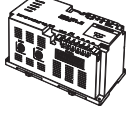
■ Accessories (Order Separately)

Item	Specifications/Design		Model	
Extension cable for R/W Heads	Standard cable 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 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 *Mount with M3 flat countersunk head screws (at least two).			V600-A81
	For the V600-D23P71/D23P72 Ultrasonic deposition can be used on the plastic container.			V600-A84
Attachment	For the V600-D23P66N			V600-A86
Lithium battery	For the V600-D2KR16 Commercially available CR2016 battery (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 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 V600-CD1D-V3 V600-CM1D	XM2A-0901
Connector Hood		XM2S-0911
Connector Plug	 V600-CA1A-V2	XM2A-2501
Connector Hood		XM2S-2511
Connector Plug	 V600-CA8A-V2 V600-CA9A-V2	MR-50F (Honda Tsushin Kogyo)
Connector Hood		MR-50L (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
Model		V600-D23P71 	V600-D23P72 	V600-D23P66N 	V600-D23P66SP 	V600-D23P61 	V600-D23P53 	V600-D23P54 	V600-D23P55 
Item									
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) 1 year (–40 to 150°C)	10 years			10 years (–40 to 110°C) 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 ² acceleration for 30 min each in 3 directions (90 min total)		10 to 2,000 Hz, 1.5-mm double amplitude, 150 m/s ² acceleration 10 times each in 3 directions (15 min)	10 to 2,000 Hz, 3.0-mm double amplitude, 300 m/s ² acceleration for 30 min each in 3 directions (90 min total)			10 to 2,000 Hz, 1.5-mm double amplitude, 150 m/s ² acceleration 10 times each in 3 directions (15 min)	
Shock resistance (destruction)		1,000 m/s ² 3 times each in 3 directions (18 times total)		500 m/s ² 3 times each in 3 directions (18 times total)	1,000 m/s ² 3 times each in 3 directions (18 times total)			500 m/s ² 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
Item					
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) (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) (See note 3.)
Vibration resistance (destruction)		10 to 500 Hz, 1.0-mm single amplitude, 150 m/s ² acceleration for 11 min each in X, Y, and Z directions			10 to 150 Hz, 0.75-mm single amplitude, 100-m/s ² acceleration for 30 min each in X, Y, and Z directions
Shock resistance (destruction)		1,000 m/s ² 3 times each in X, Y, and Z directions (18 times total)			300 m/s ² 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 ² acceleration with 3 sweeps of 11 min each in X, Y, and Z directions			
Shock resistance	Destruction: 500 m/s ² 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.

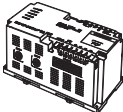
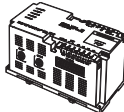

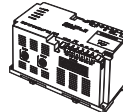

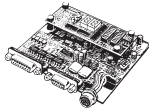
■ R/W Heads (with Separate Amplifier)

Model		Sensor section		Amplifier section	
		V600-HS51	V600-HS61	V600-HA51	
Item					
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 ² 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 ² 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 ² acceleration with 3 sweeps of 11 min each in 3 directions
Shock resistance (destruction)		1,000 m/s ² 3 times each in 3 directions (18 times total)		500 m/s ² 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

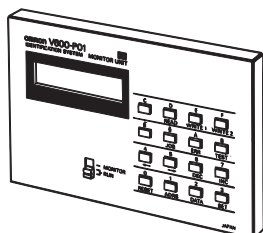
Series Model		V600 Series (Electromagnetic RFID System)					
		V600-CA1A-V2	V600-CA2A-V2	V600-CA8A-V2	V600-CA9A-V2	V600-CD1D-V3	V600-CM1D
Item							
Host interface		RS-232C	RS-422A (Maximum of 16 Units can be connected)	Parallel PNP output	Parallel NPN output	RS-232C	
Possible number of R/W Heads		2				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 4.5 to 5.5 VDC
Power consumption		35 VA max.				7.2 W max.	24 VDC: 7.2 W max. 5 VDC: 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; Leakage current: 10 mA max.				1,000 VAC, 50/60 Hz for 1 min between the points listed above; 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 ² 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

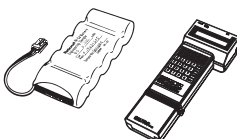
V600-P01 (for use with V600-CA□A Controllers)

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; 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 ² 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 $\pm 5\%$
Current consumption	200 mA max. (See Note 1.)
Insulation resistance	50 M Ω 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 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 ² 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.



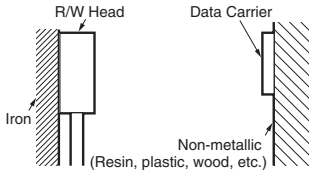




2. This does not include the connector section. The main unit is not resistant to chemicals or oils.

■ IDSC Series



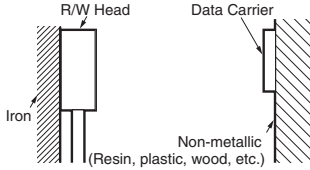




Item	Series Model	IDSC Series
		IDSC-C1DR-A IDSC-C1DT-A 
Host interface		RS-232C
Possible number of R/W Heads		1
Power supply voltage		100 to 240 VAC, 50/60 Hz
Acceptable power supply voltage		85 to 264 VAC
Power consumption		60 VA max.
Insulation resistance		20 Ω min. (at 500 VDC) between all Power 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 Leakage current: 10 mA max.
Noise immunity		1,500-V (p-p) pulses of 100-ns to 1- μ s 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 ² acceleration for 80 min each in X, Y, and Z directions
Shock resistance		150 m/s ² 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. The period that data is retained after a power interruption depends on the ambient temperature. 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.



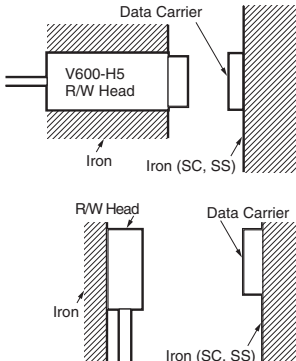

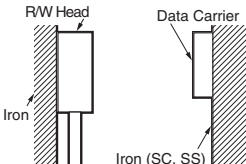
■ Transmission Distance Specifications for Battery-less DCs

Recommended combinations		Installation		Controller mode	Transmission distance	Condition for DC and R/W head installation
Data Carrier	R/W Head		Read/Write distance			
		Stationary		Irrelevant	10 to 70 mm (max. axial offset ± 10 mm)	These Data Carriers are for installation on non-metallic surfaces only. 
		Moving			30 to 60 mm (max. axial offset ± 10 mm)	
		Stationary		Irrelevant	5 to 40 mm (max. axial offset ± 10 mm)	
		Moving			15 to 40 mm (max. axial offset ± 10 mm)	
		Stationary		Irrelevant	10 to 50 mm (max. axial offset ± 10 mm)	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.
		Moving			30 to 40 mm (max. axial offset ± 10 mm)	
		Stationary		Irrelevant	5 to 30 mm (max. axial offset ± 10 mm)	
		Moving			15 to 30 mm (max. axial offset ± 10 mm)	



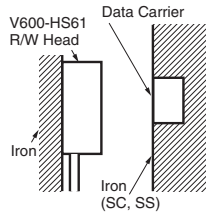
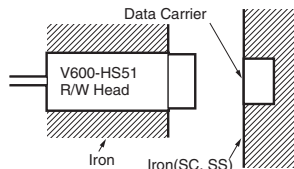
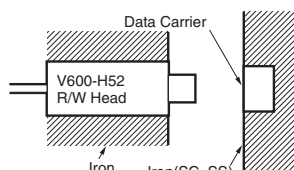






- Note:**
1. The transmission distance/transmission time priority mode setting can be made using the lower-level transmission mode setting switch or memory switch only with a Serial-interface Controller or ID Sensor Unit.
 2. With Parallel-interface Controllers, the mode setting is always transmission 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)	



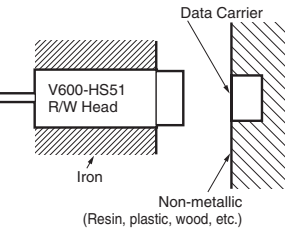
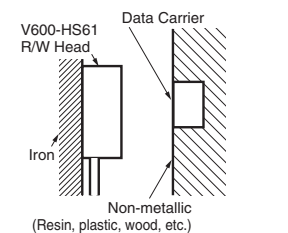
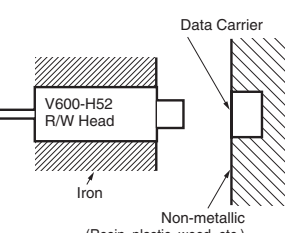


- Note:**
1. The transmission distance/transmission time priority mode setting can be made using the lower-level transmission mode setting switch or memory switch only with a Serial-interface Controller or ID Sensor Unit.
 2. With Parallel-interface Controllers, the mode setting is always transmission 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					
V600-D23P61 	V600-H11/-H11-R 	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)	
	V600-H51 	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.



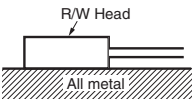
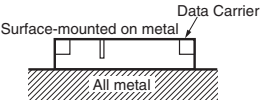
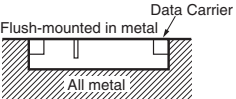




Recommended combinations		Installation		Controller mode	Transmission distance		Condition for DC and R/W head installation
Data Carrier	R/W Head						
V600-D23P53 	V600-HS51 (See note 4.) 	Stationary	Read distance	Transmission distance priority	0.5 to 4.0 mm (max. axial offset ± 2 mm)	0.5 to 4.5 mm (max. axial offset ± 1 mm)	<p>These Data Carriers are for flush mounting in metallic bases only.</p>   
				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 (See note 4.) 	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 	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 	V600-HS51 (See note 4.) 	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)	<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	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 (See note 4.) 	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 	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 	V600-HS51 (See note 4.) 	Stationary	Read distance	Transmission distance priority	0.5 to 6.5 mm (max. axial offset ± 2 mm)	<p>These Data Carriers are for flush mounting in non-metallic bases only.</p>  <p>Non-metallic (Resin, plastic, wood, etc.)</p>  <p>Non-metallic (Resin, plastic, wood, etc.)</p>  <p>Non-metallic (Resin, plastic, wood, etc.)</p> <p>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.</p>
				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 (See note 4.) 	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 	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)	

- 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

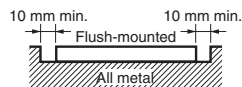
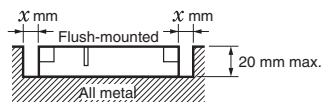
Recommended combinations		Installation		Controller mode	Transmission distance	Condition for DC and R/W head installation
Data Carrier	R/W Head					
V600-D8KR12 	V600-H07 	Stationary	Flush-mounted in metal	Irrelevant	10 to 50 mm (max. axial offset ± 10 mm)	   The listed transmission distances also apply 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 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)	
	V600-H11 	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)	
			Surface-mounted on metal		25 to 45 mm (max. axial offset ± 10 mm)	
V600-D8KR13 	V600-H07 	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)	
	V600-H11 	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 (unsealed) 	V600-H07 	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 ± 10 mm)	
		Moving	Flush-mounted in metal		See note1.	
			Surface-mounted on metal		50 to 100 mm (max. axial offset ± 10 mm)	
	V600-H11 	Stationary	Flush-mounted in metal	Irrelevant	See note1.	
			Surface-mounted on metal		10 to 65 mm (max. axial offset ± 10 mm)	
		Moving	Flush-mounted in metal		See note1.	
			Surface-mounted on metal		30 to 65 mm (max. axial offset ± 10 mm)	
V600-D2KR16 	V600-H11 	Stationary	Flush-mounted in metal	Irrelevant	2 to 15 mm (max. axial offset ± 10 mm) (See note 2.)	
			Surface-mounted on metal		2 to 15 mm (max. axial offset ± 10 mm)	
		Moving	Flush-mounted in metal		6 to 15 mm (max. axial offset ± 10 mm) See note 2.)	
			Surface-mounted on metal		10 to 15 mm (max. axial offset ± 10 mm)	

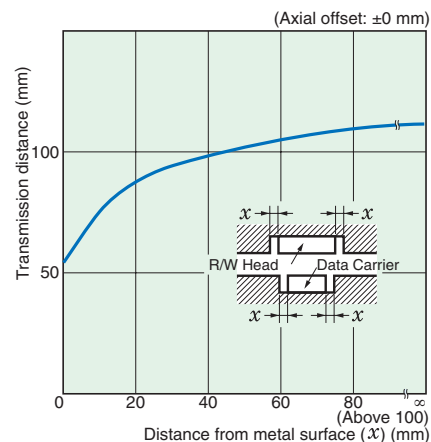
Note: 1. When Data Carriers are flush-mounted in metal, the read/write distance will depend on the distance (x) between the side of the DC and the metal surface.

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

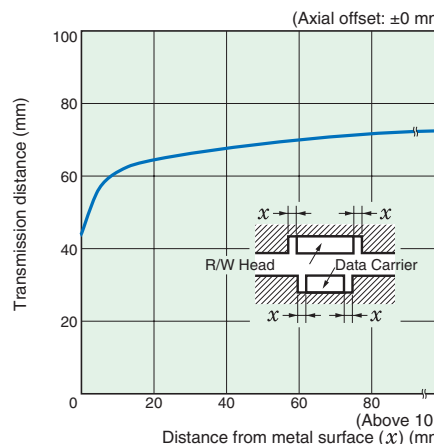
Refer to the *V600 R/W Heads and SRAM Data Carriers Operation Manual* (Cat. No. Z127) for details.



Combined with V600-H07



Combined with V600-H11



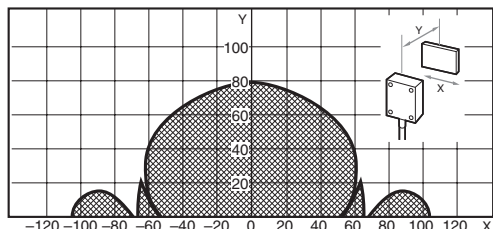
Characteristic Data (Typical)

Transmission Range

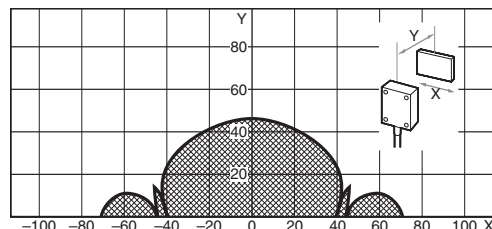
Note: The values shown in the following graphs are in millimeters. Refer to the previous six pages for details on Data Carrier and R/W Head mounting conditions.

Battery-less Compact DCs

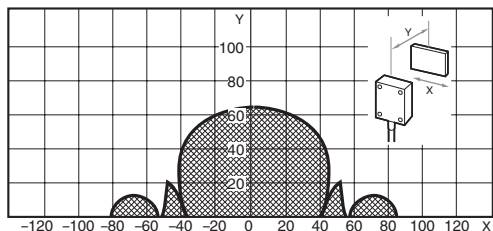
V600-D23P71 & V600-H07



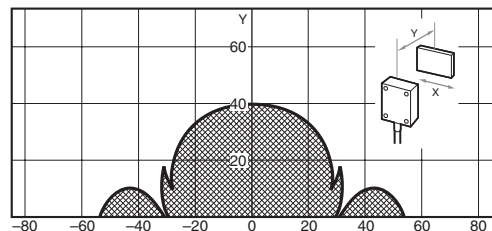
V600-D23P71 & V600-H11



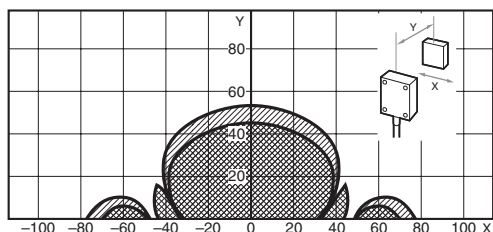
V600-D23P72 & V600-H07



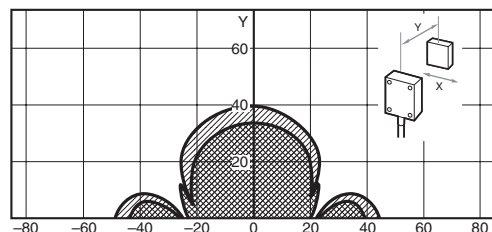
V600-D23P72 & V600-H11



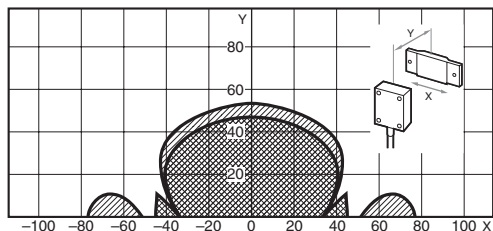
V600-D23P66N & V600-H07



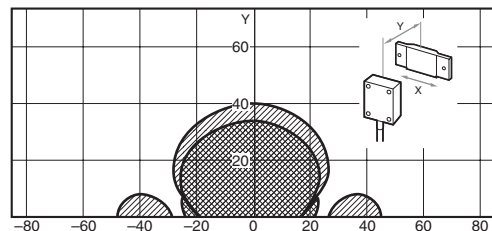
V600-D23P66N & V600-H11



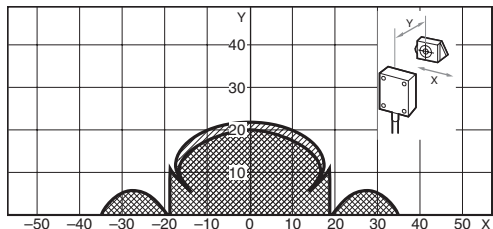
V600-D23P66SP & V600-H07



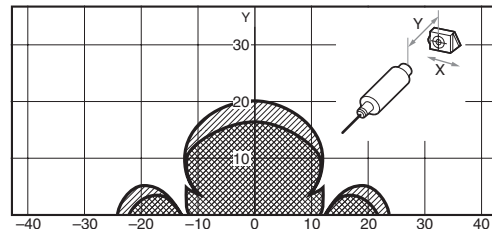
V600-D23P66SP & V600-H11



V600-D23P61 & V600-H11

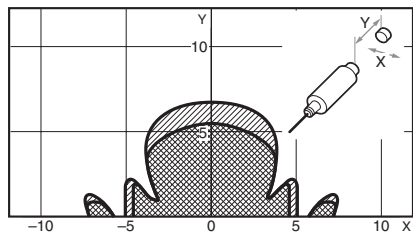


V600-D23P61 & V600-H51

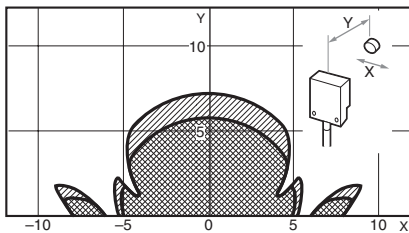


 Read range (in transmission distance priority mode)
  Write range (in transmission distance or transmission time priority mode)
 Read range (in transmission time priority mode)

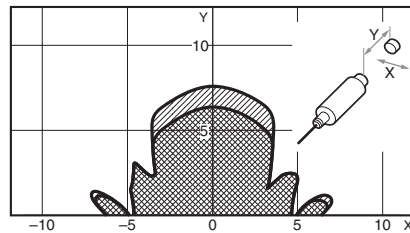
**V600-D23P53 & V600-HS51
+V600-HA51**



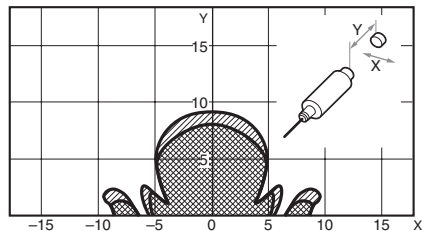
**V600-D23P53 & V600-HS61
+V600-HA51**



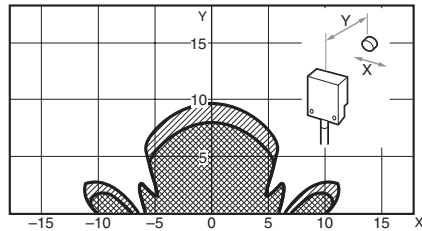
V600-D23P53 & V600-H52



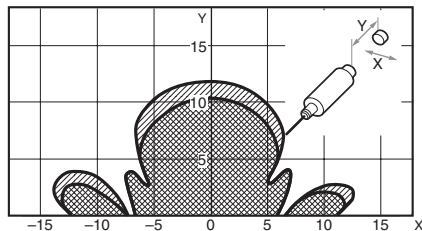
**V600-D23P54 & V600-HS51
+V600-HA51**



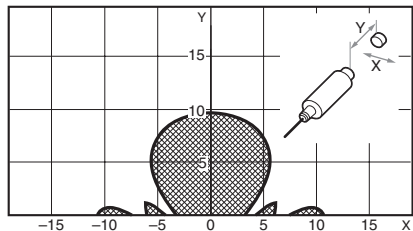
**V600-D23P54 & V600-HS61
+V600-HA51**



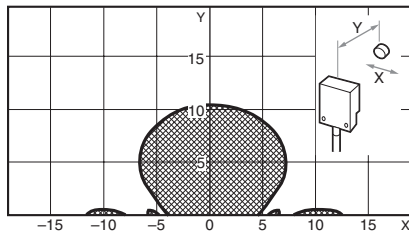
V600-D23P54 & V600-H52



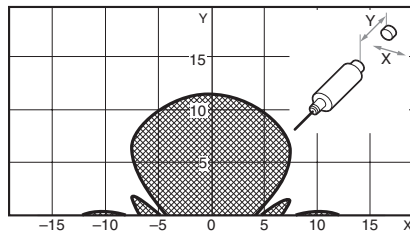
**V600-D23P55 & V600-HS51
+V600-HA51**



**V600-D23P55 & V600-HS61
+V600-HA51**



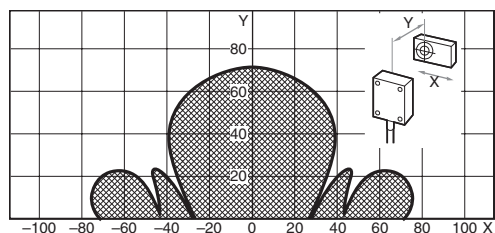
V600-D23P55 & V600-H52



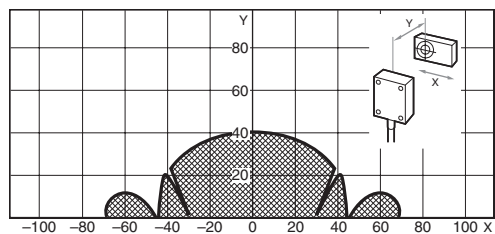
 Read range (in transmission distance priority mode)
  Write range (in transmission distance or transmission time priority mode)

Built-in-Battery DCs

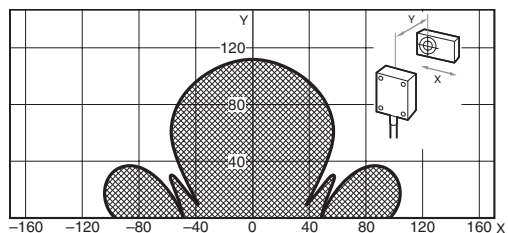
V600-D8KR12 & V600-H07



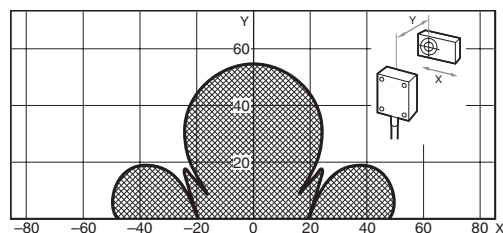
V600-D8KR13 & V600-H07



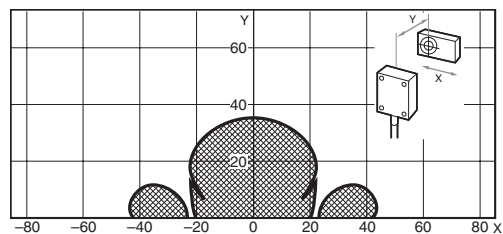
V600-D8KR04 & V600-H07



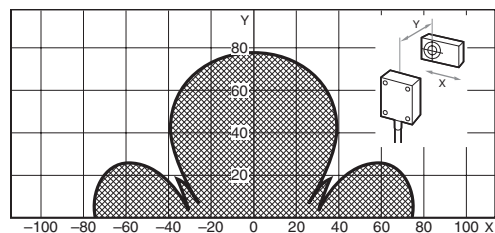
V600-D8KR12 & V600-H11



V600-D8KR13 & V600-H11

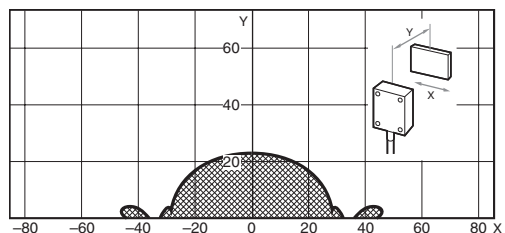



V600-D8KR04 & V600-H11



Replaceable-Battery DCs

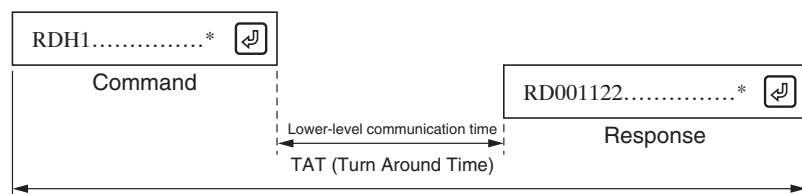
V600-D2KR15 & V600-H11



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

■ Transmission Time

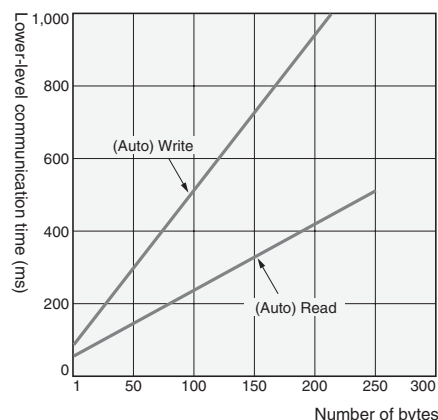
- The transmission time does not depend on the model of R/W Head or Data Carrier, although transmission times differ between Data Carriers with and without batteries.
- The turn around time (TAT) is the total time required from the issuance of a command from the host device (for example, a host computer)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

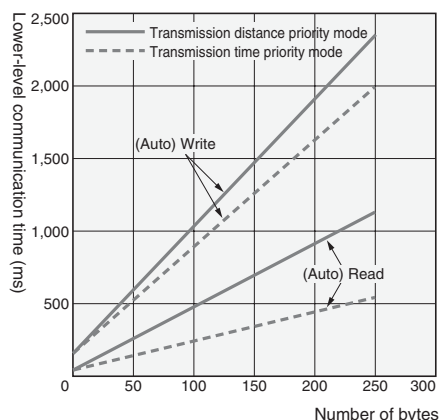


Calculation (Reference)

	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.)

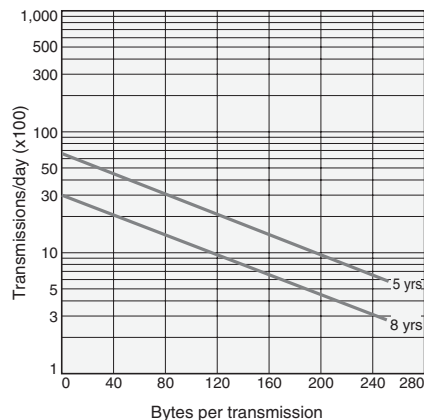
With Parallel-interface Controllers (V600-CA8A-V2/CA9A-V2) the mode is fixed to transmission distance priority.

Battery Life

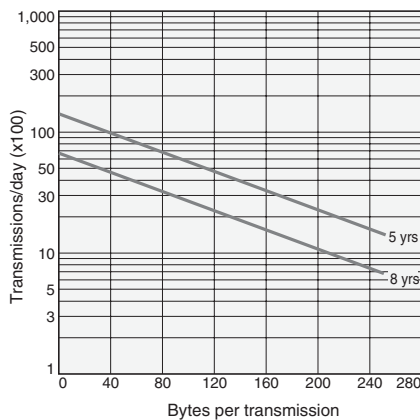
The Data Carrier has a built-in lithium battery.

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

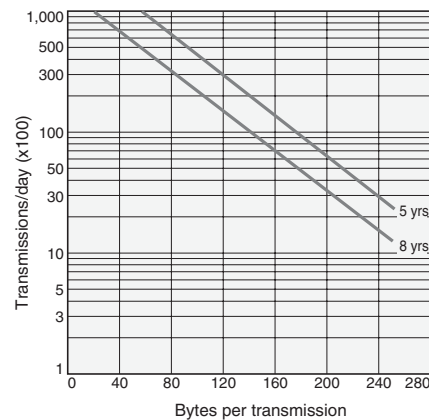
V600-D8KR12 (Typical Example)



V600-D8KR13 (Typical Example)



V600-D8KR04 (Typical Example)

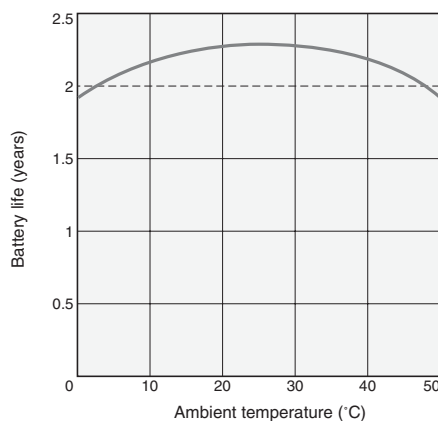


Temperature and Battery Life

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.

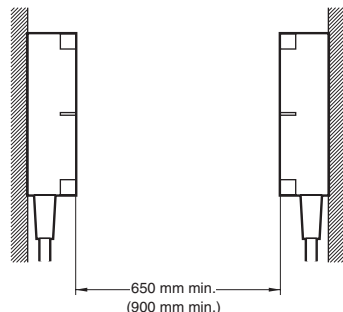
Mutual Interference

Mutual Interference Between R/W Heads

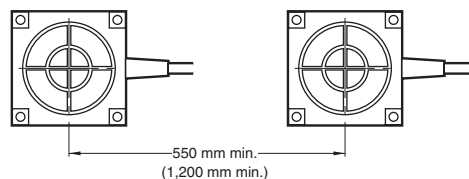
When using more than one set of R/W Heads, mutual interference between the Heads can be avoided by mounting the Heads at the specified distance as shown below.

V600-H07

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

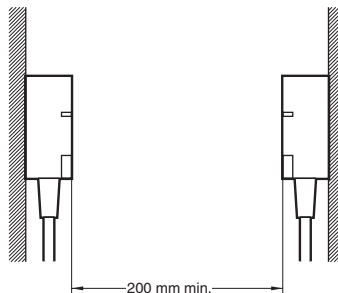


- Side-by-side
RD/WT command: 550 mm min.
Auto command: 1,200 mm min.

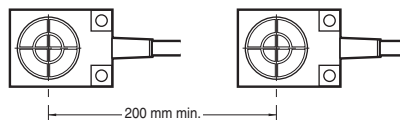


V600-H11

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

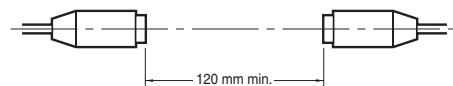


- Side-by-side
RD/WT command: 200 mm min.
Auto command: 200 mm min.

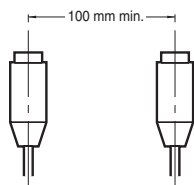


V600-H51

- Facing: 120 mm min.

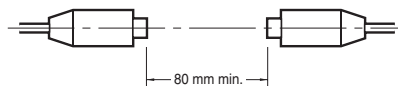


- Side-by-side: 100 mm min.

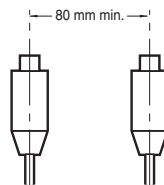


V600-H52

- Facing: 80 mm min.

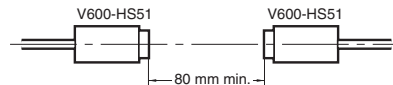


- Side-by-side: 80 mm min.

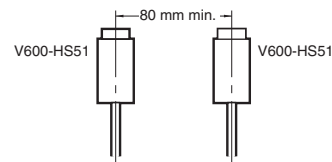


V600-HS51

- Facing: 80 mm min.

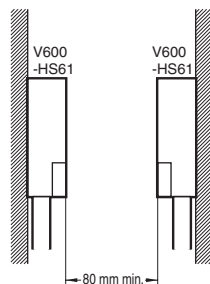


- Side-by-side: 80 mm min.

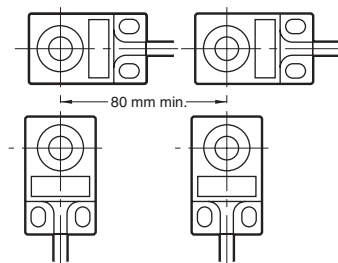


V600-HS61

- Facing: 80 mm min.



- Side-by-side: 80 mm min.



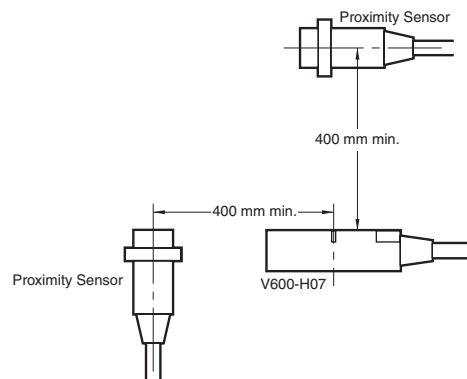
Note: If the two R/W Heads are not transmitting simultaneously (i.e., independent read/write), mutual interference will not occur. Therefore, the restriction on the distance between the Heads will not be applicable. The commands will be received by the R/W Heads and transmission will oscillate between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

Mutual Interference Between Proximity Sensors

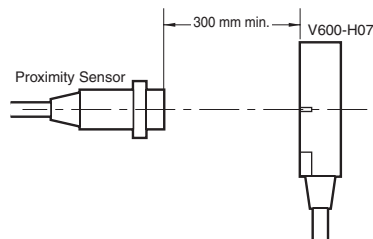
The V600-series Units use electromagnetic coupling (frequency: 530 kHz). When a V600 Unit is wired close to R/W Heads, Proximity Switches, and Sensors that have an oscillating frequency between 400 and 600 kHz, the Proximity Sensor may malfunction, so be sure to install the Units according to the distance 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.

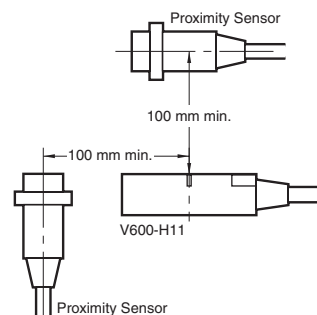


- Facing: 300 mm min.

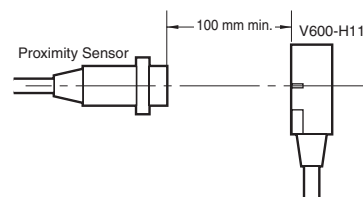


V600-H11

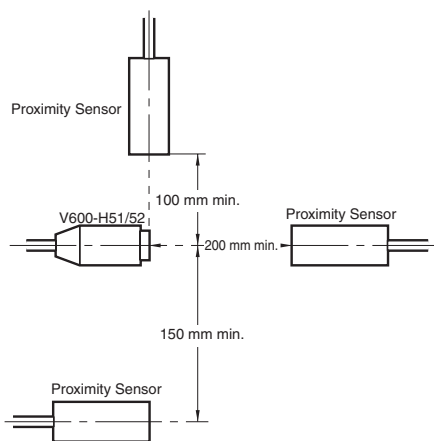
- Vertical: 100 mm min.



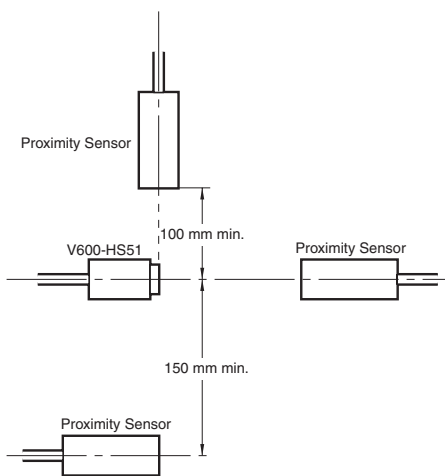
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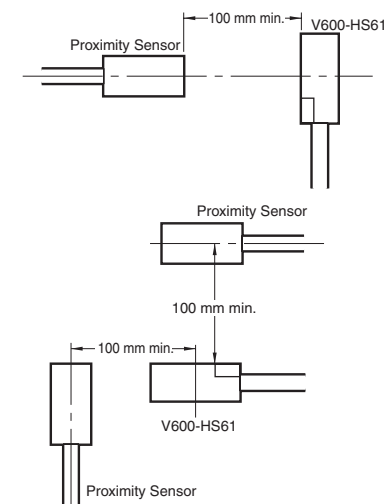
V600-H51/H52



V600-HS51



V600-HS61



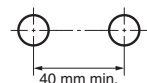
Mutual Interference Between Data Carriers

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



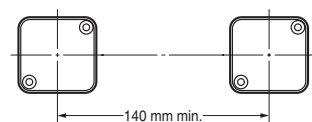
V600-D23P55

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

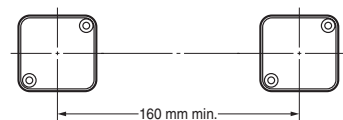


V600-D23P66N

R/W Head: V600-H11



R/W Head: V600-H07

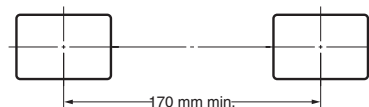


V600-D23P72

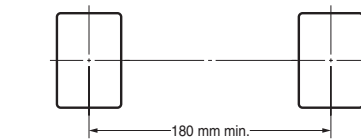
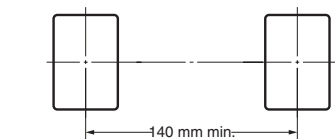
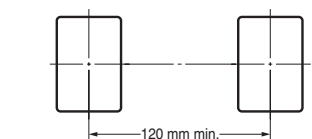
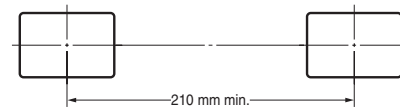
R/W Head: V600-H51



R/W Head: V600-H11

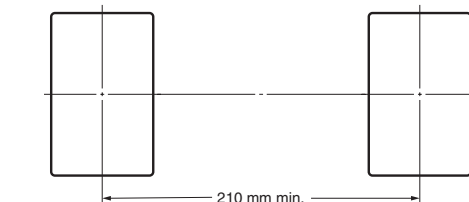


R/W Head: V600-H07



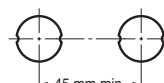
V600-D23P66SP

R/W Head: V600-H07



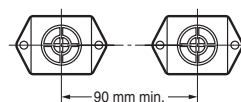
V600-D23P54

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



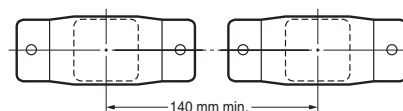
V600-D23P61

R/W Head: V600-H11/-H51

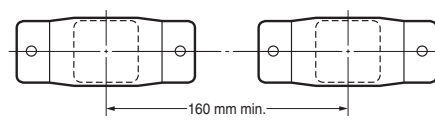


V600-D23P66SP

R/W Head: V600-H11

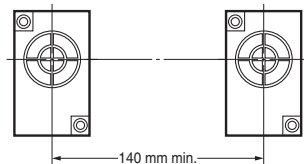
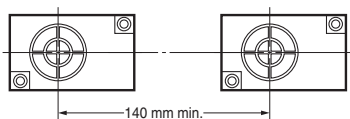


R/W Head: 600-H07

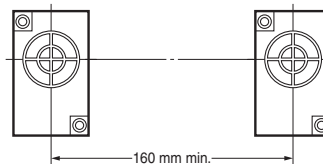
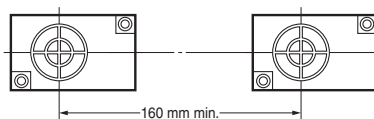


V600-D8KR12

R/W Head: V600-H11

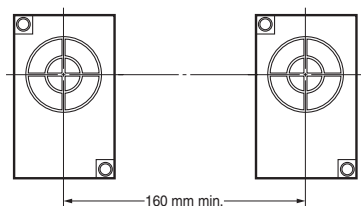
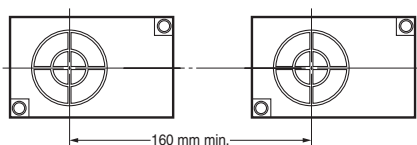


R/W Head: V600-H07

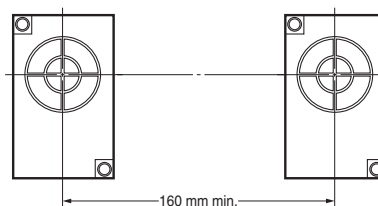
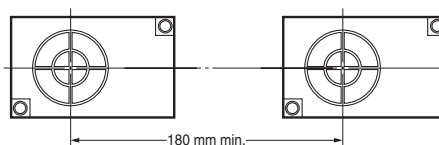


V600-D8KR13

R/W Head: V600-H11

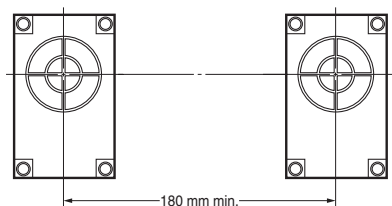
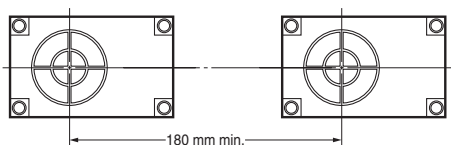


R/W Head: V600-H07

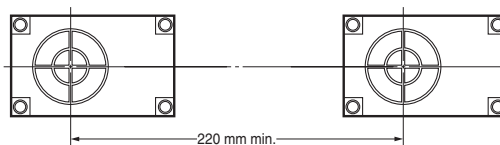


V600-D8KR04

R/W Head: V600-H11

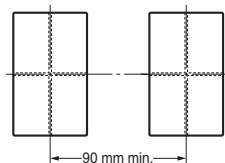
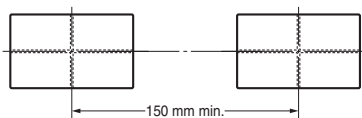


R/W Head: V600-H07



V600-D2KR16

R/W Head: V600-H11



Data Carriers

Built-in-Battery DCs

Technical drawing of the front and side views of a rectangular case. The front view shows a central circular feature with a crosshair, two mounting holes (4.5-dia.), and dimensions: total width 65, total height 40, mounting hole diameter 5, distance from top edge to mounting hole center 55 ± 0.2 , distance from left edge to mounting hole center 27, distance from bottom edge to mounting hole center 30 ± 0.2 , and distance from right edge to mounting hole center 10. The side view shows a total thickness of 15 and a central cutout width of 8. The case is made of ABS resin and the filler is epoxy resin.

Technical drawing of a rectangular plate with the following dimensions and features:

- Overall width: 86
- Distance from left edge to center of mounting hole: 31
- Distance from right edge to center of mounting hole: 5
- Overall height: 54
- Distance from top edge to center of mounting hole: 44 ± 0.2
- Distance from bottom edge to center of mounting hole: 76 ± 0.2
- Four, 4.5-dia. mounting holes
- Case: ABS resin
- Filler: Epoxy resin

Battery-less DCs

Two, 3.5-dia. mounting holes

Mounting Hole Dimensions

4-R4 25±0.2 4-R3

34 32 25±0.2

Two, 3.5-dia.

Two, 6-dia.

3.5±0.1

25±0.2

2-M3

32 34

Case: PPS resin

Technical drawing of the mounting plate showing top and side views with dimensions and labels.

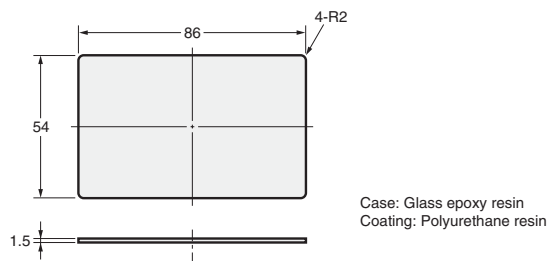
Top View Dimensions:

- Overall width: 34
- Overall height: 36.5
- Inner rectangular area: 34 (width) x 34 (height)
- Four rounded corners: 4-R6
- Two mounting holes: Two, 5.5-dia. mounting holes
- Mounting Hole Dimensions: 2-M5, 80±0.2 (center-to-center distance)

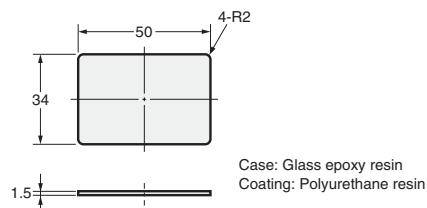
Side View Dimensions:

- Overall thickness: 1.3
- Top flange thickness: 6.5
- Bottom flange thickness: 2.5 max.
- Central rectangular area: 80±0.2 (width) x 95 (length)
- Coating: PFA resin

V600-D23P71

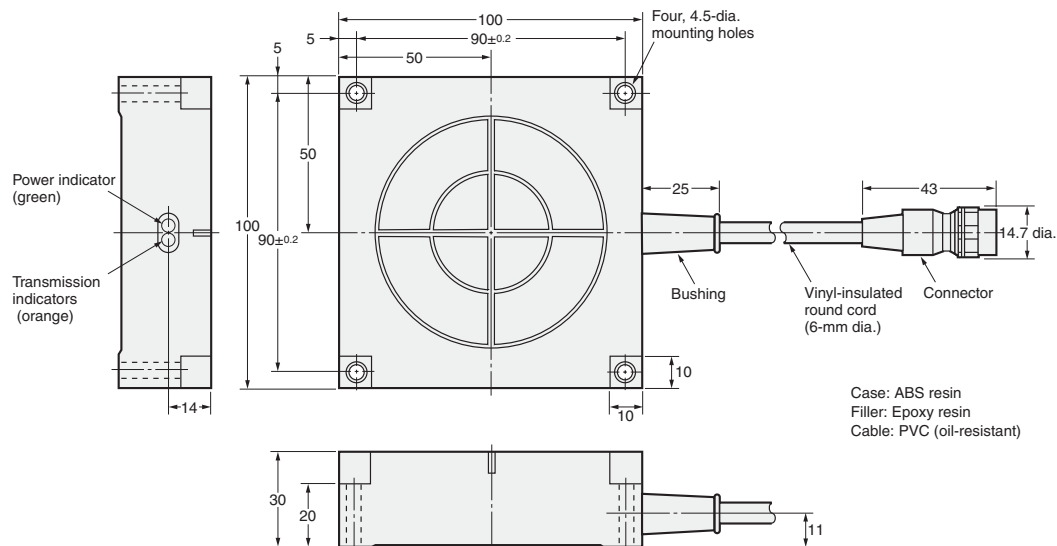


V600-D23P72

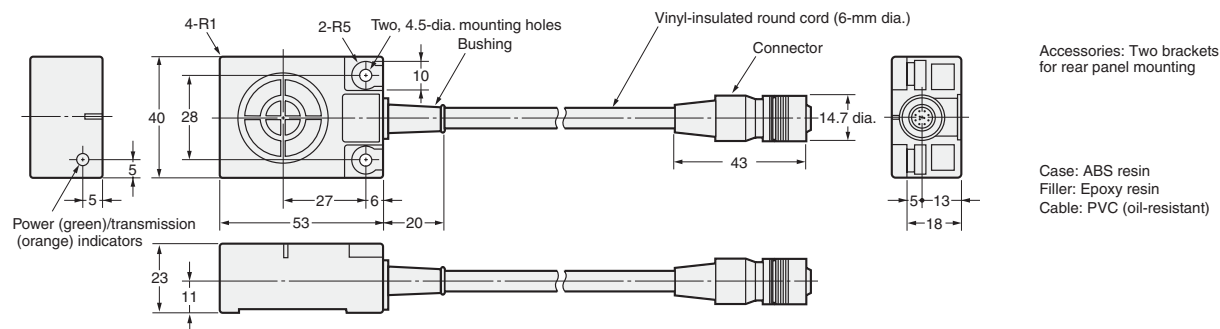


R/W Heads

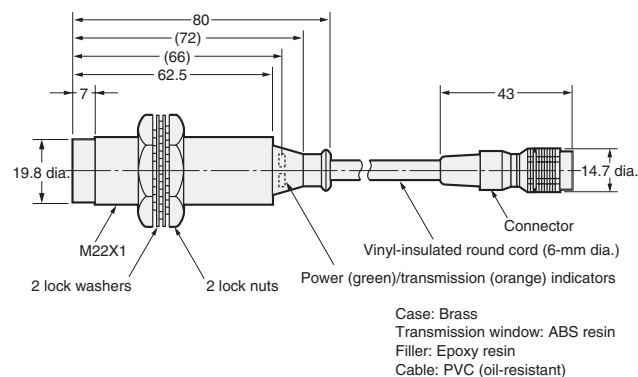
V600-H07



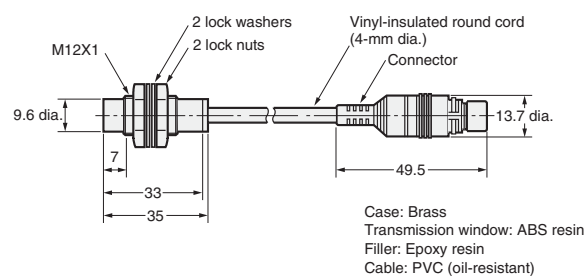
V600-H11



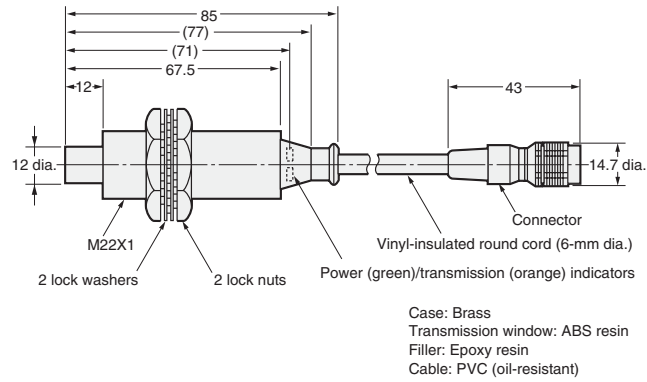
V600-H51



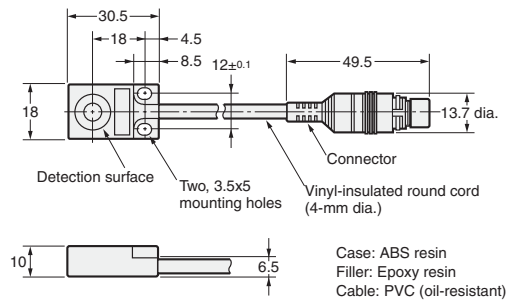
V600-HS51 (Sensor Section)



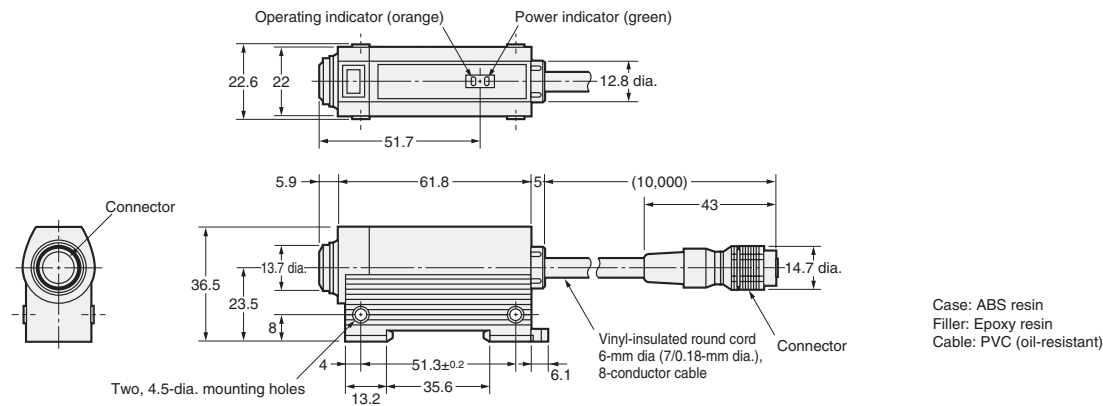
V600-H52



V600-HS61 (Sensor Section)

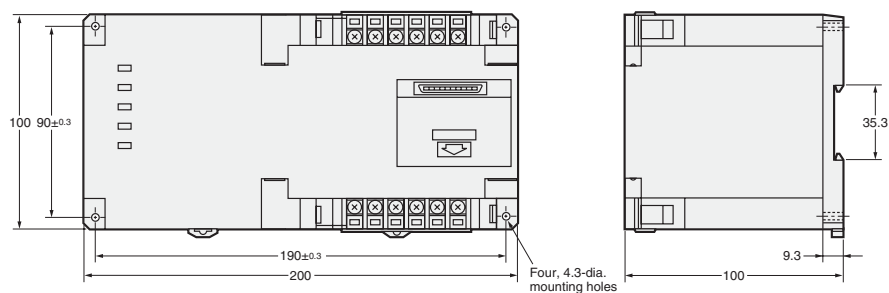


V600-HA51 (Amplifier Section)

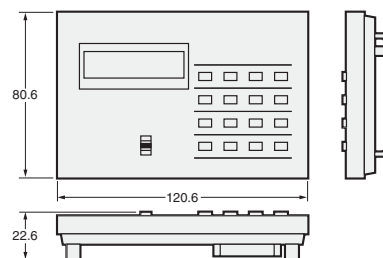


ID Controllers

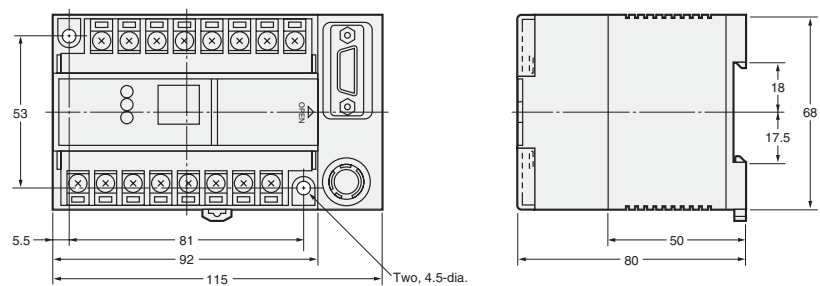
V600-CA□A-□ (Multi-purpose)



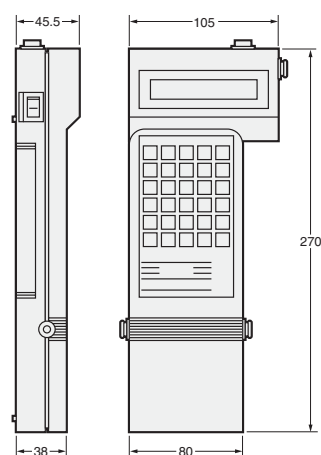
V600-P01 Monitor Unit (For use with V600-CA□A-□)



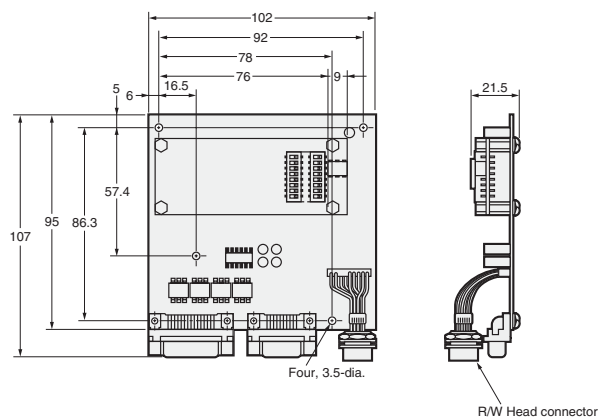
V600-CD1D-V3 (Compact)



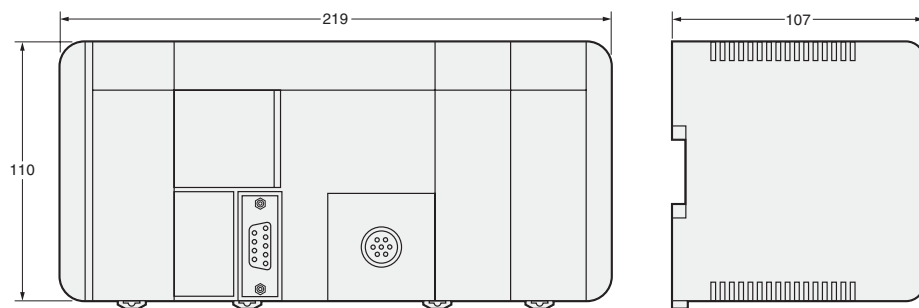
V600-CB-US Handheld ID Controller



V600-CM1D (Board-Mounted)

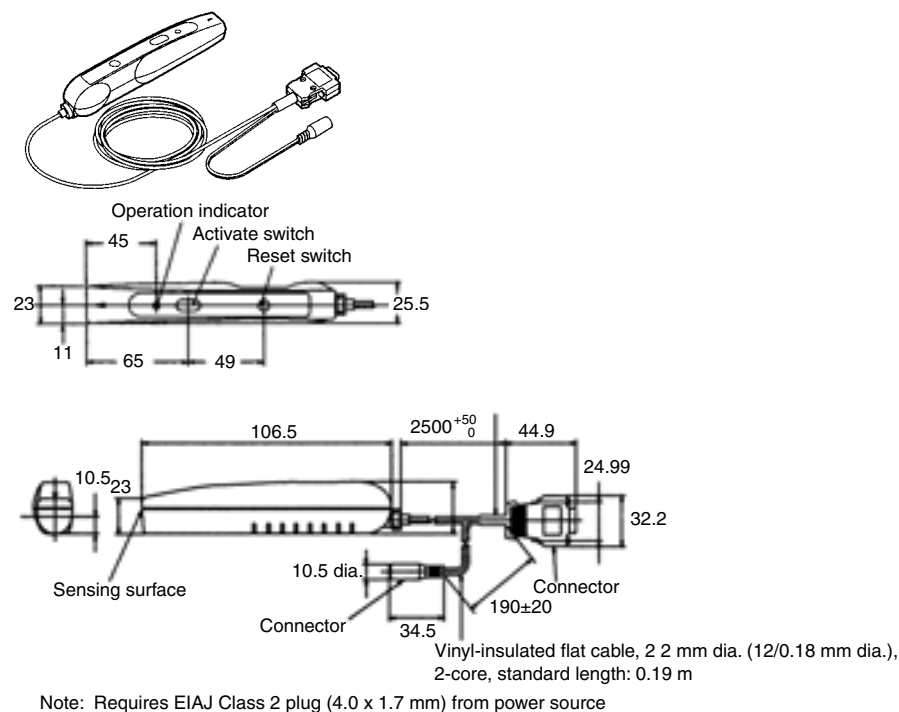


IDSC-C1D□-A (Stand-alone)



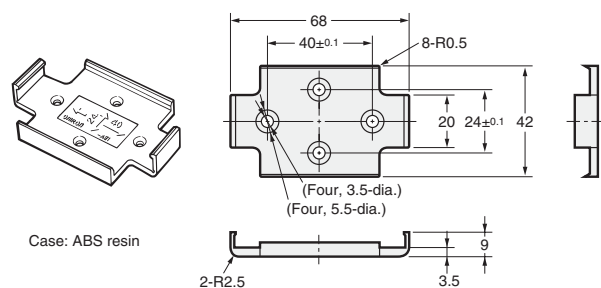
Accessories

V600-CH1D Handheld Reader/Writer

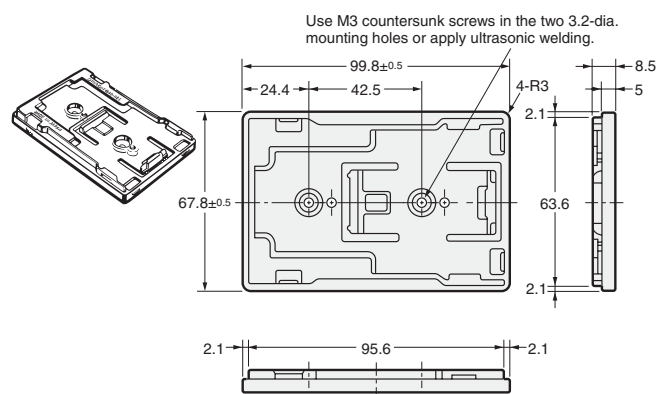


Holder

V600-A81 for V600-D2KR16 Data Carriers

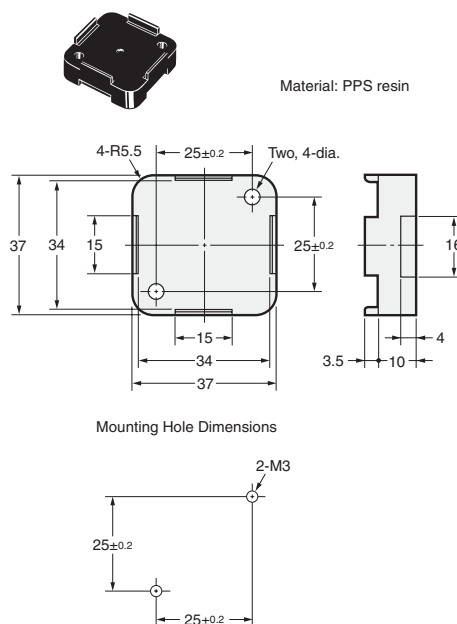


V600-A84 for V600-D23P71/-D23P72 Data Carriers



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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V600 Handheld Reader/Writer

V600-CH1D

Combines the Functionality of a Read/Write Head with an ID Controller in a Single, Compact, Lightweight Reader/Writer

- Connects directly to a personal computer or PLC via RS-232C
- Protective construction of the main unit is IP63 (IEC standard) for outdoor applications
- Compatible with V600-series Data Carriers connected to existing systems
- Reads and writes Data Carrier data
- Special commands allow the Reader/Writer to read and write data within the Data Carrier across several regions at once
- Data transmissions are activated by using commands from the main unit or by using a switch on the Reader/Writer



Caution

This data sheet contains only information required for selecting the Reader/Writer, not for actual operation. Be sure to read the relevant operation manuals carefully before attempting to operate any of the equipment described here.

Ordering Information

Item	Part number
Handheld Reader/Writer	V600-CH1D
5 VDC AC adapter	V600-A20

Specifications

■ GENERAL

Power supply voltage		5 VDC from AC adapter
Permissible power supply voltage		5 VDC \pm 5%
Current consumption		200 mA max. (See Note 1.)
Insulation resistance		50 M Ω 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 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 ² (approx. 20G), 3 times each in 3 directions
Ambient temperature	Operating	-10 to 55°C (14 to 131°F) with no icing
	Storage	-25 to 65°C (-13 to 149°F) with no icing
Ambient operating humidity		35% to 85% (with no condensation)
Ambient atmosphere		No corrosive gasses
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 connector and cable)

Note: 1. This figure is for idling or stand-by.

The inrush current must be 250 mA maximum.

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

■ CHARACTERISTICS

Diagnostic functions	Checks for CPU errors, memory errors, and transmission errors.
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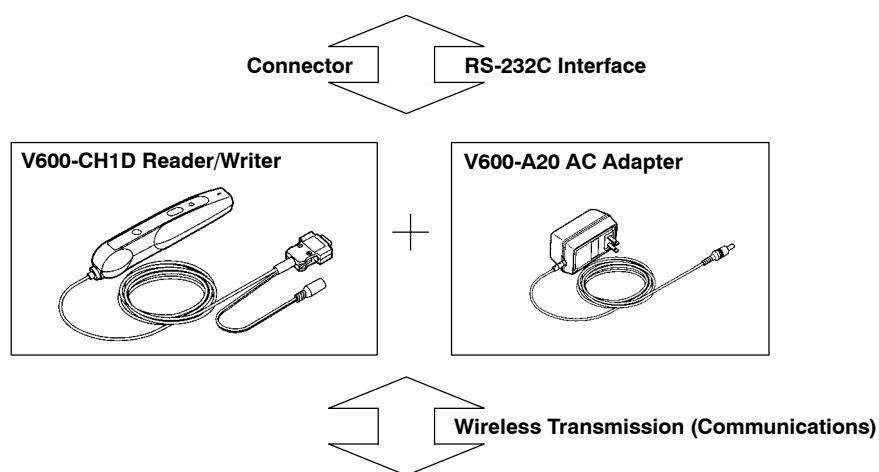
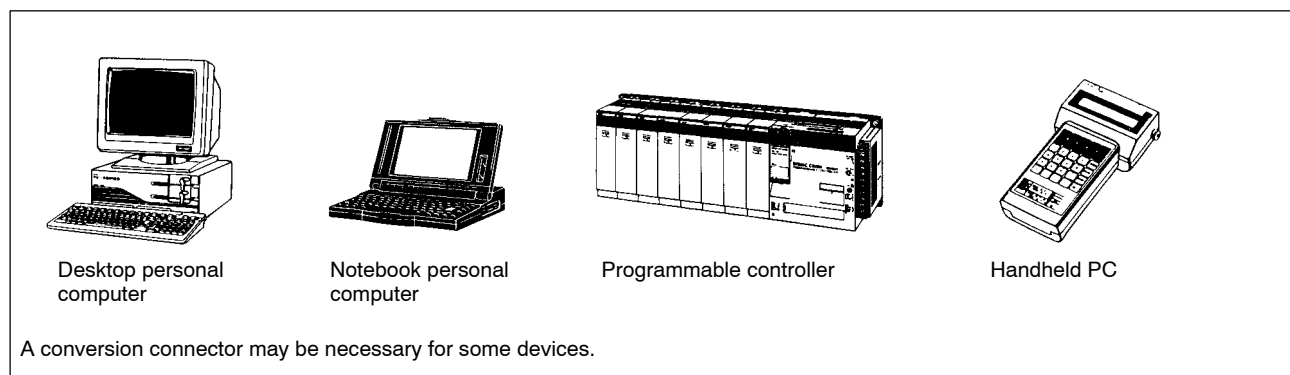
■ HOST COMMUNICATIONS INTERFACE

Connectors	9-pin D-sub connector
Standard	RS-232C (CMOS Serial Interface available upon request)
Transmission connection	1:1
Communications method	2-wire, half duplex
Synchronization method	Start-stop (stop bits: 1 or 2)
Baud rate	2400/4800/9600/19200 bps (See Note.)
Transmission code	ASCII (7-bit) or 8-bit JIS code
Transmission control protocol	1:1
Error detection	Vertical parity (even, odd, none)

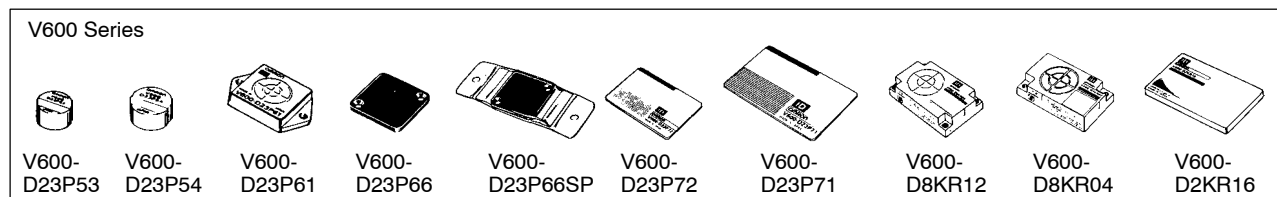
Note: The baud rate is to be set according to the setting command issued from the host unit.

System Configuration

■ HOSTS

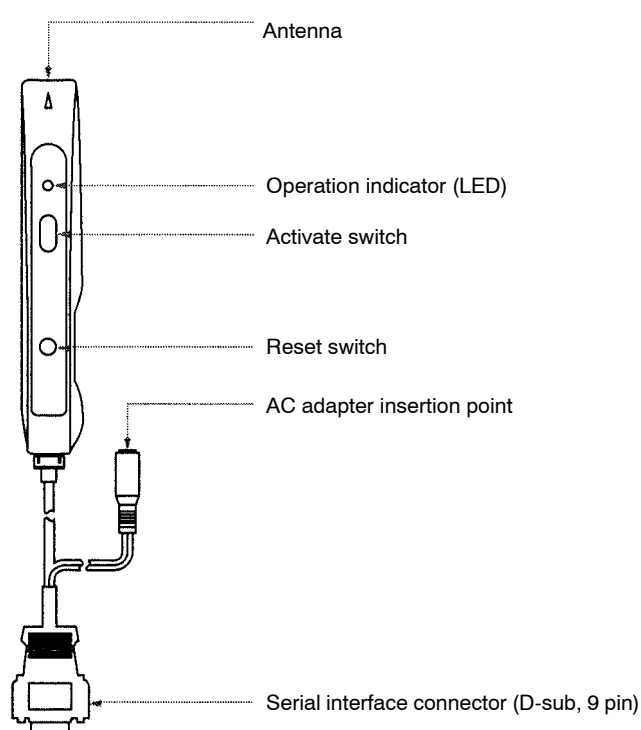


■ DATA CARRIERS

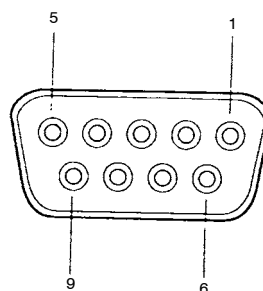


Nomenclature

■ V600-CH1D HANDHELD READER/WRITER



9-Pin D-Sub Connector (Female)



Connector Pin Layout

Pin no.	Abbrev.	Description	Wire color
1			
2	SD	Send data	Brown
3	RD	Receive data	Red
4			
5	SG	Signal ground	Blue
6	RS	Request to send	Gray
7	CS	Clear to send	Orange
8	CS	Clear to send	Orange
9			

Specifications

■ TRANSMISSION DISTANCES (RECOMMENDED COMBINATIONS)

Transmission with the currently available V600-series Data Carriers is possible.

Data carrier (dimensions: mm)		V600-CH1D Handheld Reader/Writer
EE-PROM	V600-D23P53 (Dia. 8 × 5)	0 to 2.5 mm
	V600-D23P54 (Dia. 12 × 6)	0 to 4 mm
	V600-D23P61 (36 × 24 × 6)	0 to 11 mm
	V600-D23P66 (34 × 34 × 3.5)	0 to 17 mm
	V600-D23P66SP (95 × 36.5 × 6.5)	0 to 12 mm
	V600-D23P71 (86 × 54 × 1.5)	0 to 25 mm
	V600-D23P72 (50 × 34 × 1.5)	0 to 23 mm
S-RAM	V600-D8KR12 (65 × 40 × 15)	0 to 25 mm
	V600-D2KR16 (65 × 40 × 5)	0 to 10 mm
	V600-D8KR04 (86 × 54 × 20)	0 to 35 mm

Note: 1. Data Carrier Installation Conditions:

V600-D23P53/P54: Embedded in iron.

V600-D23P61: Metal (iron) on the back surface of the Data Carrier.

V600-D23P66/P66SP/P71/P72: No metal on the back surface of the Data Carrier.

V600-D8KR12/R04: Metal (iron) on the back surface of the Data Carrier.

V600-D2KR16: Data Carrier installed on a bracket (V600-A81) and attached to a metal (aluminium) plate.

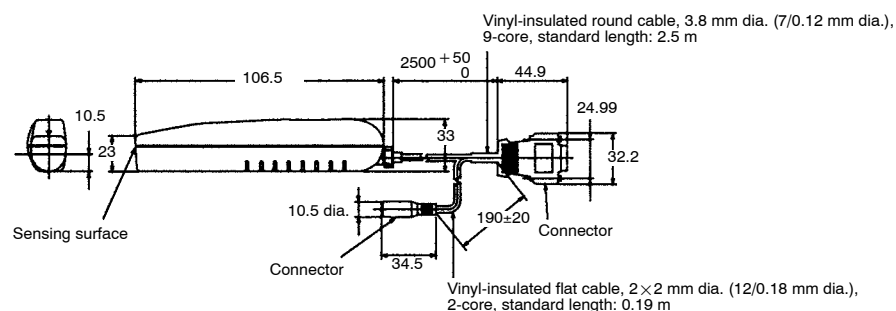
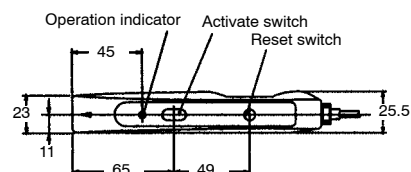
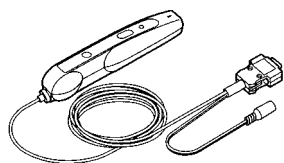
2. When there is no metal around the Data Carrier or on the back surface, then the specified transmission distances apply.

3. When using the V600-D23P66 at temperatures lower than -10°C, transmission may not be possible at the specified distance. It would then be necessary to move the Reader/Writer away from the Data Carrier.

Dimensions

Unit: mm (inch)

■ V600-CH1D HANDHELD READER/WRITER



Note: Requires EIAJ Class 2 plug (4.0×1.7mm) from power source

Precautions

■ AVOID DAMAGE TO THE V600-CH1D

- Never use submersed in water or in a high water-pressure environment.
- Do not place excessive strain on cables by pulling on them.
- Do not expose the end of the main unit to shock.
- Never push the activate switch with your nail or a metal object.

■ COMMUNICATIONS

In order to use the Handheld Reader/Writer, it will be necessary to create a communications program on the main unit.

Terms and Conditions

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WARRANTY OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

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APPLICATION CONSIDERATIONS

SUITABILITY FOR USE OMRON shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the product in the customer's application or use of the product.

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use which apply to the product. This information by itself is not sufficient for a complete determination of the suitability of the product in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list

of all possible uses of this product, nor is it intended to imply that the uses listed may be suitable for this product:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

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DISCLAIMERS

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

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Intelligent Flag I/II V600-HA

Innovative RFID Electronic Flags to Replace Mechanical Flag and Kanban Systems

- Doesn't need a program and can be used like a sensor.
- Advanced line construction at minimal cost.
- Saves space.
- Precise installation not required (Transmission distance: 100 mm max.).
- A verification function provided on multi-functional type.
- Addition of 16-bit models to the series responds to applications from Kanban to quality control.
- Equipped with a wiring reduction mode and communications parity check function (16-bit models).
- Both NPN and PNP output available.
- FCC certified.



Ordering Information/Specifications

■ Amplifier

Item	Type Model	Read-only (8-bit)		Multi-functional (8-bit)		Read-only (16-bit)
		V600-HAR91	V600-HAR81	V600-HAM91	V600-HAM81	V600-HAR92
Power supply		24 VDC $\pm 10\%$, ripple (p-p): 10%				
Current consumption		130 mA max.				
Input		Transistor output or contact output Short-circuit current: 3 mA (typical) (IN terminal and 0-V short-circuit) OFF voltage: 15 to 30 VDC ON voltage: 0 to 5 VDC Input impedance: 8.2 k Ω Applied voltage: 30 VDC max.				Transistor output OFF voltage: 15 to 30 VDC Input impedance: 8.2 k Ω Short-circuit current: 3 mA (typical) (for 0-V short-circuit of INHIBIT/TRG) ON voltage: 0 to 5 VDC Applied voltage: 30 VDC max.
Output		NPN open collector output, 20 mA max. at 30 VDC, residual voltage: 2 V max.	PNP open collector output, 20 mA max. at 30 VDC, residual voltage: 2 V max.	NPN open collector output, 20 mA max. at 30 VDC, residual voltage: 2 V max.	PNP open collector output, 20 mA max. at 30 VDC, residual voltage: 2 V max.	NPN open collector output, 20 mA max. at 30 VDC, residual voltage: 2 V max.
Diagnostic functions		Checks for CPU errors and transmission errors				
Insulation resistance		50 M Ω max. (at 500 VDC) between cable terminals and case				
Dielectric strength		500 VAC, 50/60 Hz for 1 min between cable terminals and case (leakage current: 1 mA max.)				

Item	Type Model	Read-only (8-bit)		Multi-functional (8-bit)		Read-only (16-bit)
		V600-HAR91	V600-HAR81	V600-HAM91	V600-HAM81	V600-HAR92
Vibration resistance		Destruction: 10 to 150 Hz, 0.3-mm double amplitude, with 4 sweeps of 8 min each in 3 directions				Destruction: 10 to 150 Hz, 1.5-mm double amplitude, with 4 sweeps of 8 min each in 3 directions
Shock resistance		Destruction: 294 m/s ² , 3 times each in 6 directions				
Ambient temperature		-10 to 55°C (with no icing)				
Ambient humidity		35% to 85% (with no condensation)				
Storage temperature		-25 to 65°C				
Degree of protection		IEC60529: IP40				
Ground		Ground to 100 Ω or less.				
Material		ABS resin (case)				
Cable length		Standard, 0.5 m with a dedicated connector (See note.)				
Weight		Approx. 170 g				Approx. 180 g

Note: The connector is not waterproof. If there is a possibility that the connector may be exposed to water, keep it inside the control box. Be sure to use the connector together with the separately sold interface cable.

■ Functions

V600-HAR91/-HAR81 (Read-only type)

Reads the 8-bit data (1 byte) of the set address and outputs to the 8 data output lines.

V600-HAM91/-HAM81 (Multi-functional type)

The amplifier has the following three basic functions.

Read

Reads the 8-bit (1 byte) data of the set address and outputs to the 8 data output lines.

Write

Writes on the set address the 8-bit (1 byte) data designated via the 8 data input lines.

Verify

Reads the 8-bit data (1 byte) of the set address, compares with the 8-bit (1 byte) data input via the 8 verification data input lines, and outputs the verification result.

V600-HAR92 (Read-only type)





Reads the 16-bit data (2 bytes) of the set address and outputs to the 16 data output lines.

■ Interface Cable

Amplifier	Cable length	Interface Cable
V600-HAR91/81 (Connector: 20 pin)	2 m	V600-A60R
	5 m	V600-A61R
	10 m	V600-A62R
V600-HAM91/81 V600-HAR92 (Connector: 26 pin)	2 m	V600-A60M
	5 m	V600-A61M
	10 m	V600-A62M

Note: The interface cable connector is not waterproof. If there is a possibility that the connector may be exposed to water, keep it inside the control box. The maximum cable length is 10 m.

■ Sensor

Item	Model Shape	V600-HS51	V600-HS61	V600-HS63	V600-HS67
					
Transmission frequency	530 kHz				
Ambient temperature	-10 to 60°C			-10 to 70°C	
Storage temperature	-25 to 75°C				
Ambient humidity	35% to 95%				
Insulation resistance	50 MΩ (at 500 VDC) between cable terminal and case				
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between cable terminal and case (leakage current: 1 mA max.)				
Degree of protection	IEC60529: IP67				
Vibration resistance	Destruction: 10 to 2,000 Hz, 3-mm double amplitude, with 2 sweeps of 15 min each in 3 directions			Destruction: 10 to 500 Hz, 2-mm double amplitude, with 3 sweeps of 11 min each in 3 directions	
Shock resistance	Destruction: 981 m/s², 3 times each in 3 directions (18 times total)			Destruction: 490 m/s², 3 times each in 3 directions (18 times total)	
Cable length	2 m (fixed)				
Wireless transmission error direction	16-bit CRC (Cyclic Redundancy Check) in both directions				
Indicator	---			Power: green	
Weight	Approx. 70 g			Approx. 190 g	Approx. 540 g

■ Transmission Distance Specifications

Recommended Combinations

Data Carrier		Amplifier Sensor	V600-HAR91/-HAR81/-HAM91/-HAM81/-HAR92			
			V600-HS51	V600-HS61	V600-HS63	V600-HS67
Memory EEPROM (Battery-less type)	V600-D23P53	0.5 to 3.0 mm	0.5 to 3.0 mm	---	---	---
	V600-D23P54	0.5 to 5.0 mm	0.5 to 5.5 mm	---	---	---
	V600-D23P55	0.5 to 7.0 mm	0.5 to 7.0 mm	0.5 to 9.5 mm	---	---
	V600-D23P61	0.5 to 8.0 mm	0.5 to 9.0 mm	2 to 16 mm	---	---
	V600-D23P66N	---	---	5 to 30 mm	5 to 35 mm	---
	V600-D23P66SP	---	---	5 to 25 mm	5 to 30 mm	---
	V600-D23P71	---	---	5 to 35 mm	10 to 70 mm	---
	V600-D23P72	---	0.5 to 18 mm	5 to 35 mm	10 to 50 mm	---
Memory SRAM (Built-in-battery type)	V600-D8KR12	5 to 15 mm	5 to 18 mm	5 to 45 mm	10 to 60 mm	---
	V600-D8KR13	---	---	10 to 30 mm	10 to 40 mm	---
	V600-D8KR04	---	---	10 to 65 mm	10 to 100 mm	---
	V600-D2KR16	---	---	2 to 15 mm	---	---

Note: 1. The specifications take fluctuations in ambient temperature and slight differences between products into account.

2. The read distance and write distance are the same.

3. Sensor Installation Conditions

• V600-HS51: When flush-mounted in iron

Axial offset from the Data Carrier: ±2.0 mm

- V600-HS61: When surface-mounted on metal (ferrous)
Axial offset from the Data Carrier: ±2.0 mm
- V600-HS63: When surface-mounted on metal (ferrous)
Axial offset from the Data Carrier: ±10.0 mm
- V600-HS67: When surface-mounted on metal (ferrous)
Axial offset from the Data Carrier: ±10.0 mm

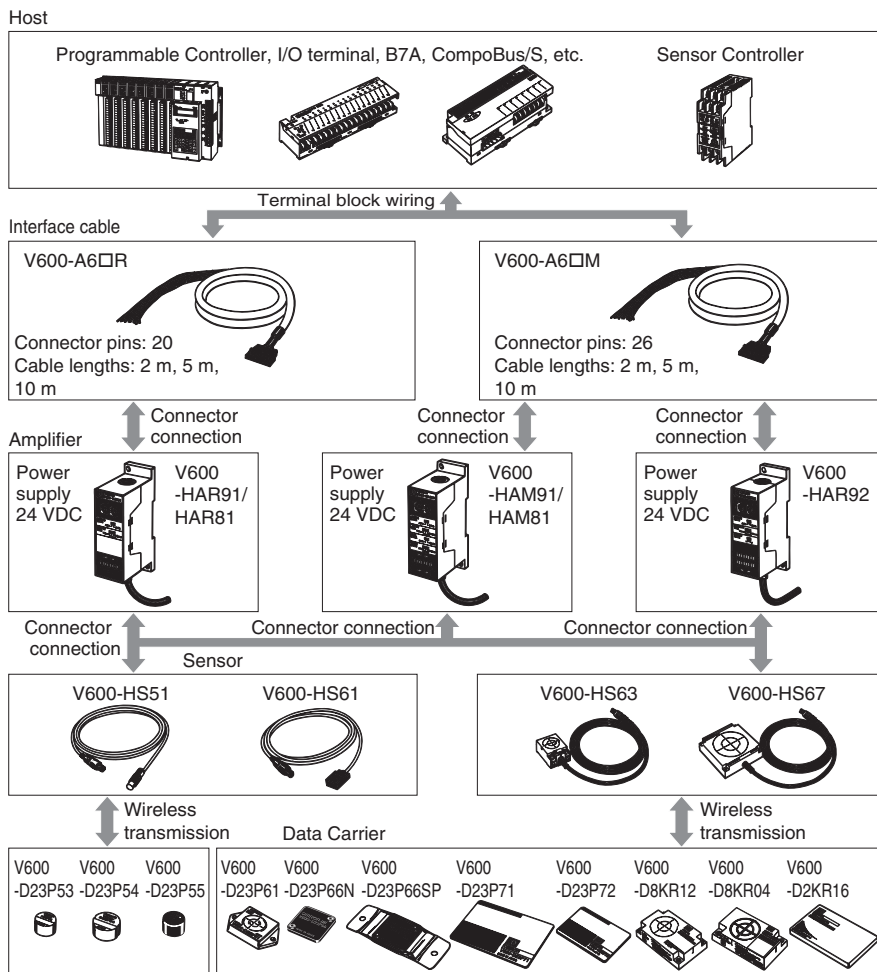
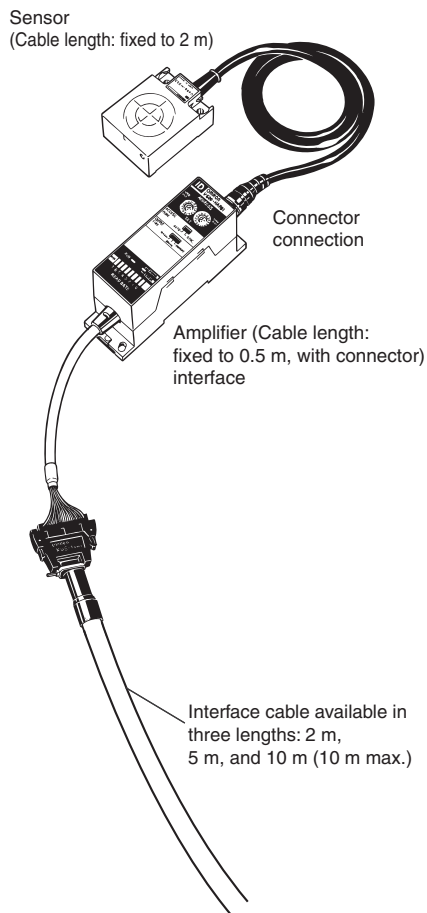
4. Data Carrier Installation Conditions

- V600-D23P53/-P54: When flush-mounted in iron
- V600-D23P55/-P66N/-P66SP/-P71/-P72: When surface-mounted on resin (no metal on the backside)
- V600-D23P61: When surface-mounted on metal (ferrous)
- V600-D8KR12/-13/-04: When surface-mounted on metal (ferrous)
- V600-D2KR16: When the Data Carrier attached to the holder is mounted on a metal (ferrous) surface

5. The transmission distance specified in the specifications is also applicable when the Data Carrier is mounted on non-metallic surfaces.

6. The Data Carrier is stationary.

System Configuration

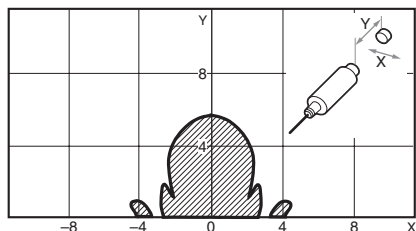


Characteristic Data (Typical)

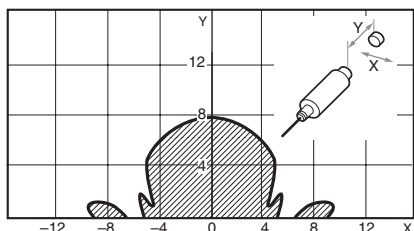
■ Transmission Range

Combinations with the V600-HS51 Sensor

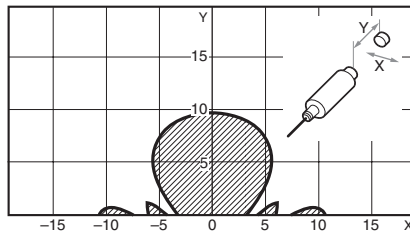
V600-HS51 & V600-D23P53



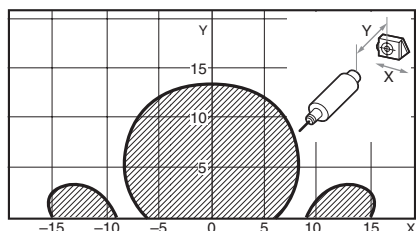
V600-HS51 & V600-D23P54



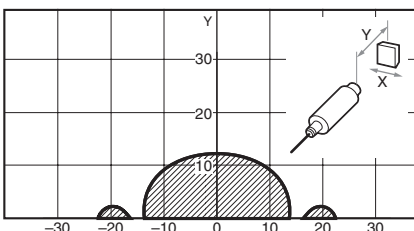
V600-HS51 & V600-D23P55



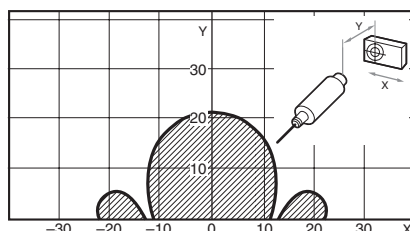
V600-HS51 & V600-D23P61



V600-HS51 & V600-D23P66N

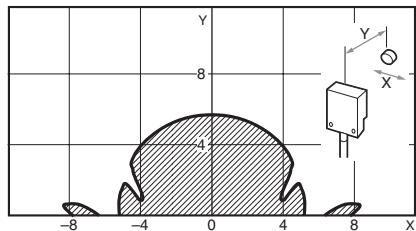


V600-HS51 & V600-D8KR12

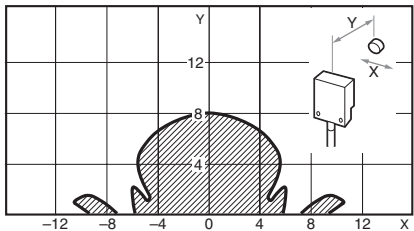


Combinations with the V600-HS61 Sensor

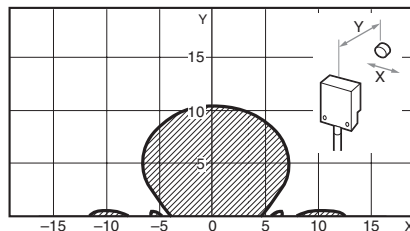
V600-HS61 & V600-D23P53



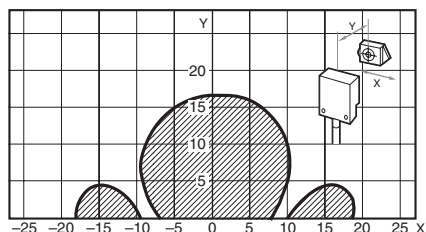
V600-HS61 & V600-D23P54



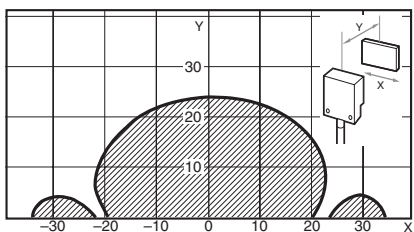
V600-HS61 & V600-D23P55



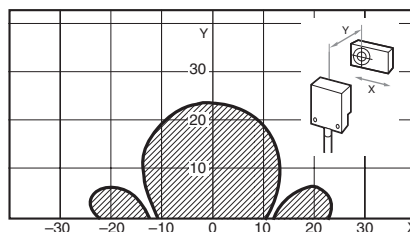
V600-HS61 & V600-D23P61



V600-HS61 & V600-D23P72

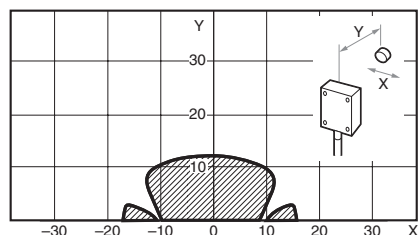


V600-HS61 & V600-D8KR12

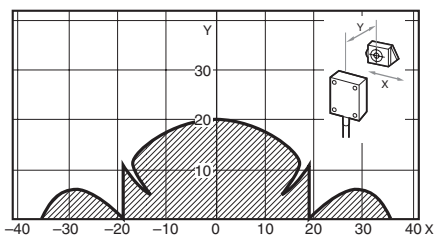


Combinations with the V600-HS63 Sensor

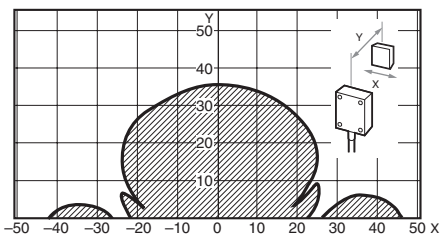
V600-HS63 & V600-D23P55



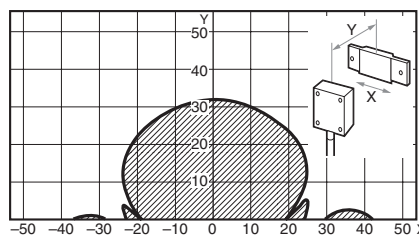
V600-HS63 & V600-D23P61



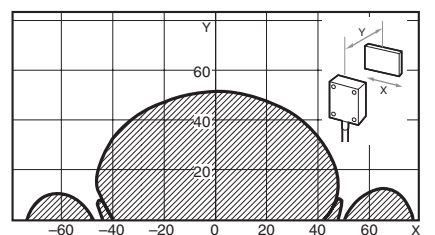
V600-HS63 & V600-D23P66N



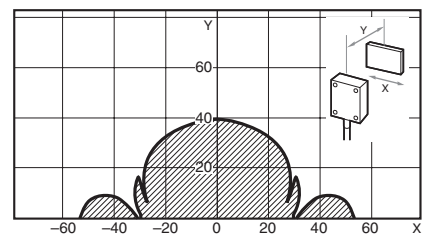
V600-HS63 & V600-D23P66SP



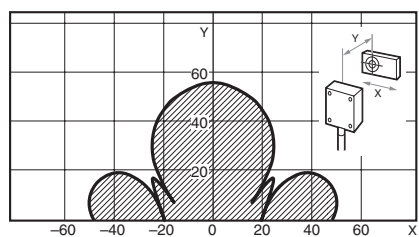
V600-HS63 & V600-D23P71



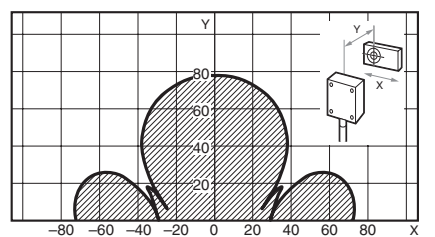
V600-HS63 & V600-D23P72



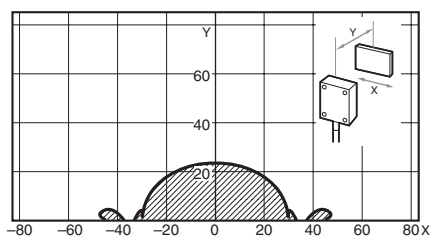
V600-HS63 & V600-D8KR12



V600-HS63 & V600-D8KR04

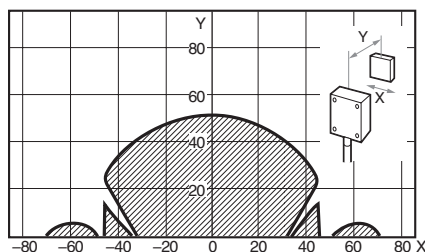


V600-HS63 & V600-D2KR16

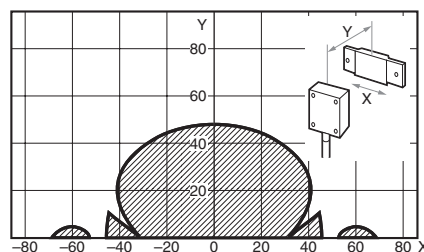


Combinations with the V600-HS67 Sensor

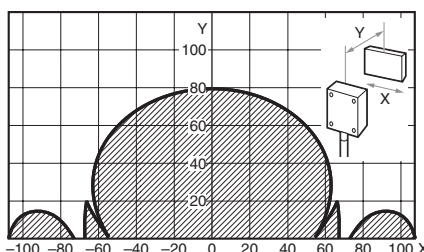
V600-HS67 & V600-D23P66N



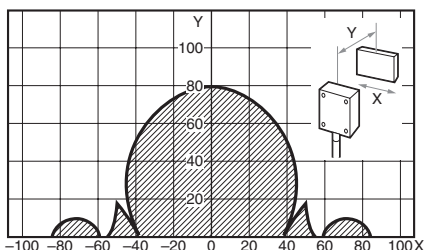
V600-HS67 & V600-D23P66SP



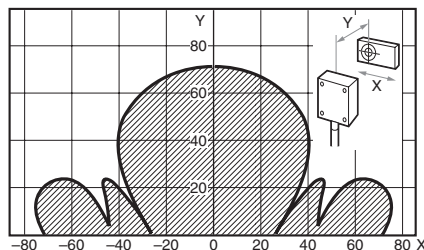
V600-HS67 & V600-D23P71



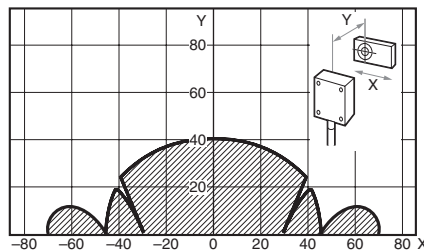
V600-HS67 & V600-D23P72



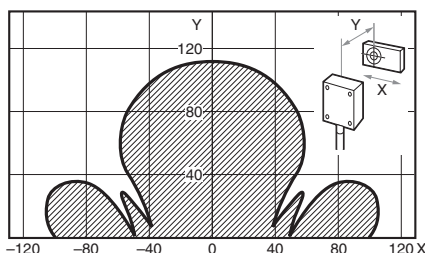
V600-HS67 & V600-D8KR12



V600-HS67 & V600-D8KR13



V600-HS67 & V600-D8KR04



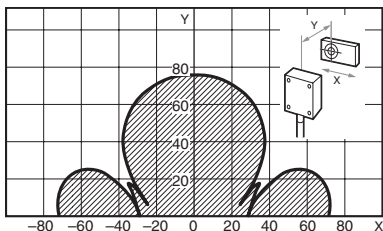
Transmission Time

The transmission time refers to the time required for communications between the Sensor and the Data Carrier. It is used for calculating the travel speed of the auto command.

$$\text{DC speed (conveyor speed)} = \frac{\text{Distance travelled in the transmission range}}{\text{Transmission time}}$$

Model		V600-HAR91/-HAR81/-HAM91/-HAM81			V600-HAR92
		Read	Write		Read
Mode type		DATA READ mode, VERIFY READ mode	BYTE mode	BIT SET mode, BIT CLEAR mode	DATA READ mode
Data Carrier type	EEPROM	75 ms	138 ms	150 ms	77 ms
	SRAM	60 ms	95 ms	107 ms	62 ms

Example: Combinations with the V600-HAR91, V600-HS63, and V600-D8KR04 Sensors.



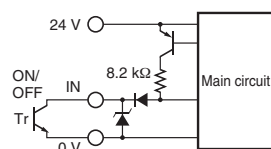
$$\text{DC speed (conveyor speed)} = \frac{75 \text{ (mm)}}{60 \text{ (ms)}} = \frac{75 \times 10^{-3} \text{ (m)}}{60 \times 10^{-3} \times 1/60 \text{ (min)}} = 75 \text{ (m/min)}$$

- Note:**
1. The DC speed varies depending on transmission distance Y and the axial offset. It is recommended that you refer to the transmission range graphs and use the product where the range is the largest.
 2. This calculation is intended as a guideline only. Perform a test with the actual product prior to use.
 3. This equation does not include transmission error processing.

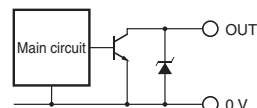
Circuit Configuration

V600-HAR91 V600-HAM91

Input Circuit

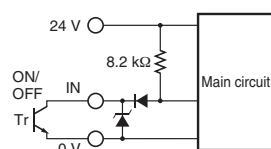


Output Circuit

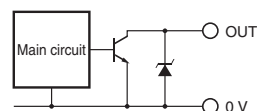


V600-HAR92

Input Circuit

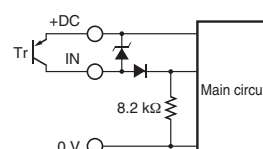


Output Circuit

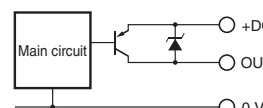


V600-HAR81 V600-HAM81

Input Circuit



Output Circuit



Precautions

■ Cautions

Caution
Be sure to house the V600-HA□91/-HA□81/-HA□92 together with their connectors and cable in control boxes when using them and do not expose them to water, oil, dust, metal powder, corrosive gas, or organic solvent, otherwise they may malfunction, suffer damage, or burn.

Caution
The connectors of the V600-HA□91/-HA□81/-HA□92 can be mounted to metal plates, provided that there is an insulation plate with a thickness of 1.5 mm minimum between each of the connectors and metal plates.

Input/Output

The Data Input and Data Output lines are set to "1" when the transistor turns ON and to "0" when it turns OFF.

Do not use a solid-state output with the following ratings with the V600-HAM91/-HAM81, otherwise an external input error may result.

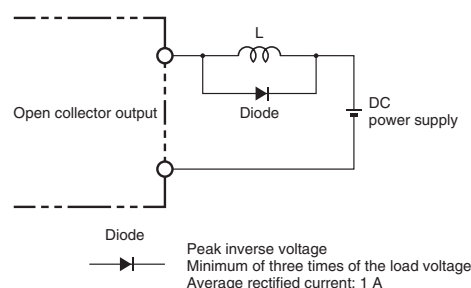
1. Maximum switching current: 1 A min.
2. Minimum switching current: 10 mA min.
3. Response time (ON to OFF): 3 ms min.

The following OMRON products cannot be connected to this product.

- CVM1-OD219, C20H, C28H, C40H, or C60H Programmable Controllers
- Sensor Controllers other than from the S3D2 Series

When using a contact output, pay careful attention to chattering and to the minimum switching current. Also note that the minimum switching current may be specified for some solid-state outputs.

When connecting an inductive load or an electrical device that tends to generate noise to the output, connect a diode in parallel with the load. Connect the cathode side of the diode to the positive side of the power source.



Power Supply Voltage

Do not impose any voltage exceeding the rated voltage range. Doing so, or applying alternating current (100 VAC) may cause the product to explode or burn.

Load Short-circuiting

Do not short-circuit the load connected to the product or connect to the power supply. Doing so may cause the product to explode or burn.

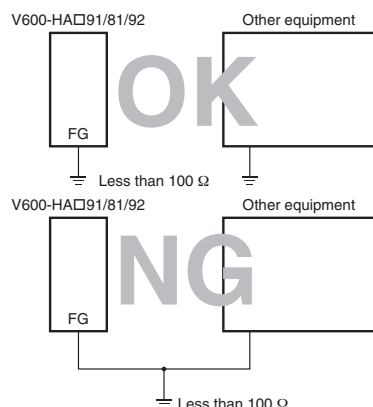
Wiring

Avoid wiring mistakes such as incorrect polarity in the power supply. Wiring mistakes may cause the product to explode or burn.

Correct Use

Grounding

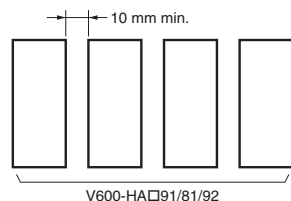
The FG line is provided for grounding to the earth. When using the Amplifier in an environment where it is exposed to large amounts of noise or if the V600-HA□91/-HA□81/-HA□92 Amplifier malfunctions, provide a Class-3 ground (ground resistance of 100 Ω or less). Note that sharing the grounding wire with other equipment or grounding to the beam of a building will adversely affect the grounding effect.



Mounting

Amplifier Spacing

When installing V600-HA□91/V600-HA□81/V600-HA□92 Amplifiers in a row, provide a minimum space of 10 mm between Amplifiers in order to prevent them from being affected by the heat produced by each Amplifier.



When housing the Amplifiers in a box, provide a fan or ventilation opening for radiating the heat.

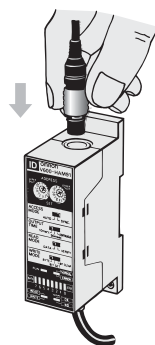
When wiring power cables, which carry large current such as motor drive cables, near the V600-HA□91/81/92 Amplifiers, conduct necessary tests to make sure that the installation conditions are fully satisfied.

I/O Interface Requirements

1. The TRG input must be 10 ms min.
2. The INHIBIT input must be 20 ms min.
3. Minimum of 5 ms is required as the transfer time of the Read/Write Selection Input (W/R).
4. The read data output must be read after the Normal End Output is set to ON.

Connecting the Sensor

Hold the black part of the connector, line up the notch and push it in until it clicks.



Compatibility with the SRAM Memory Type Data Carrier

1. If the Data Carrier is stationary in the transmission area for a long time when using the V600-HA□91/81 in the AUTO mode, or when using the V600-HAR92, it will drastically reduce the battery life. Therefore, stop the oscillation in the sensor either by turning off the power of the V600-HA□91/81/92 Amplifier or by setting the Inhibit input to ON.
2. Use a Data Carrier that has the oscillation frequency of 530 kHz. Note that the following models manufactured before February 1991 cannot be used.
 - V600-D2KR01
 - V600-D2KR02

Precautions When Using the AUTO Mode

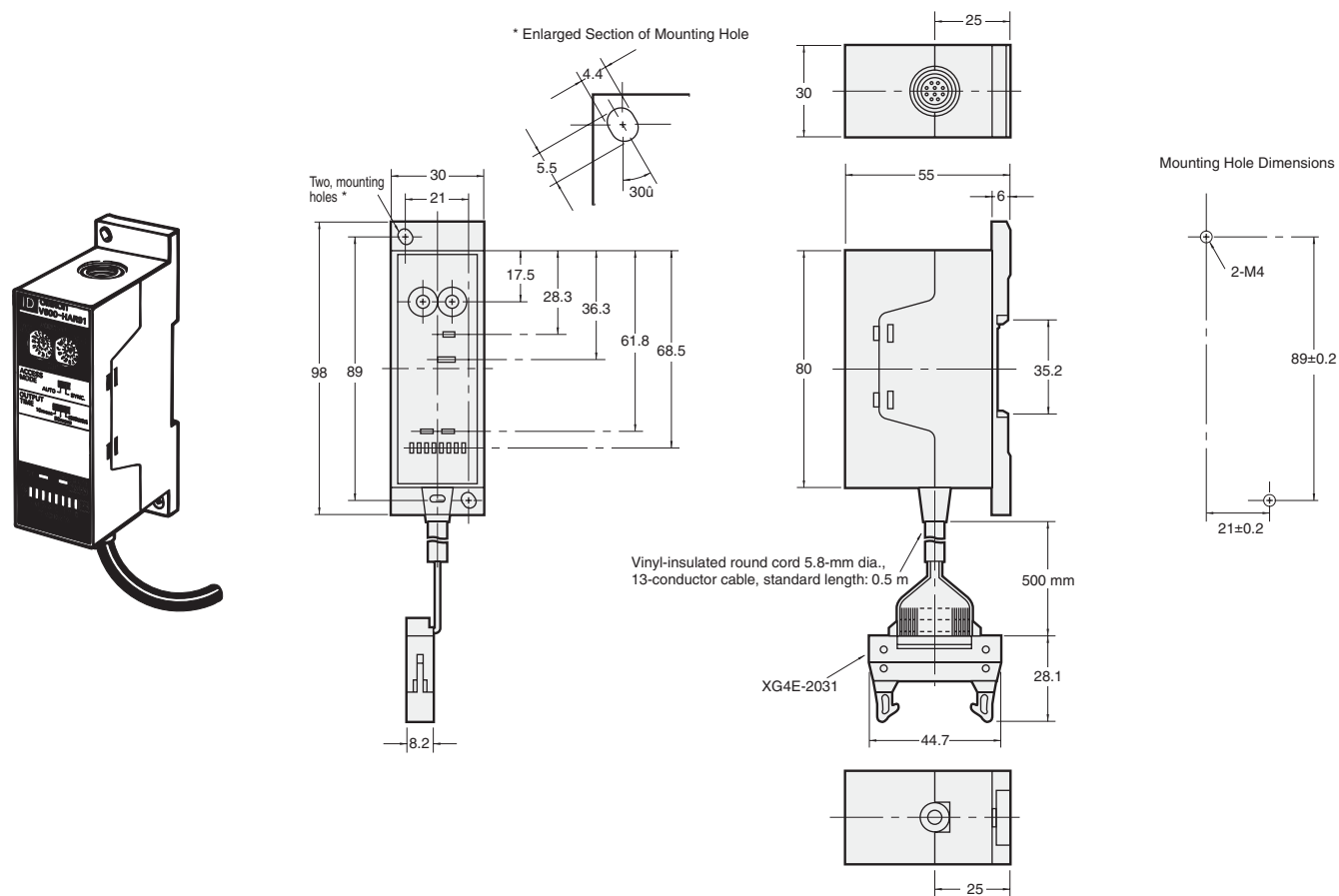
If transmitting to the Data Carrier while it is traveling under the AUTO mode, conduct tests to make sure that the travel speed and installation conditions are fully satisfied.

Dimensions

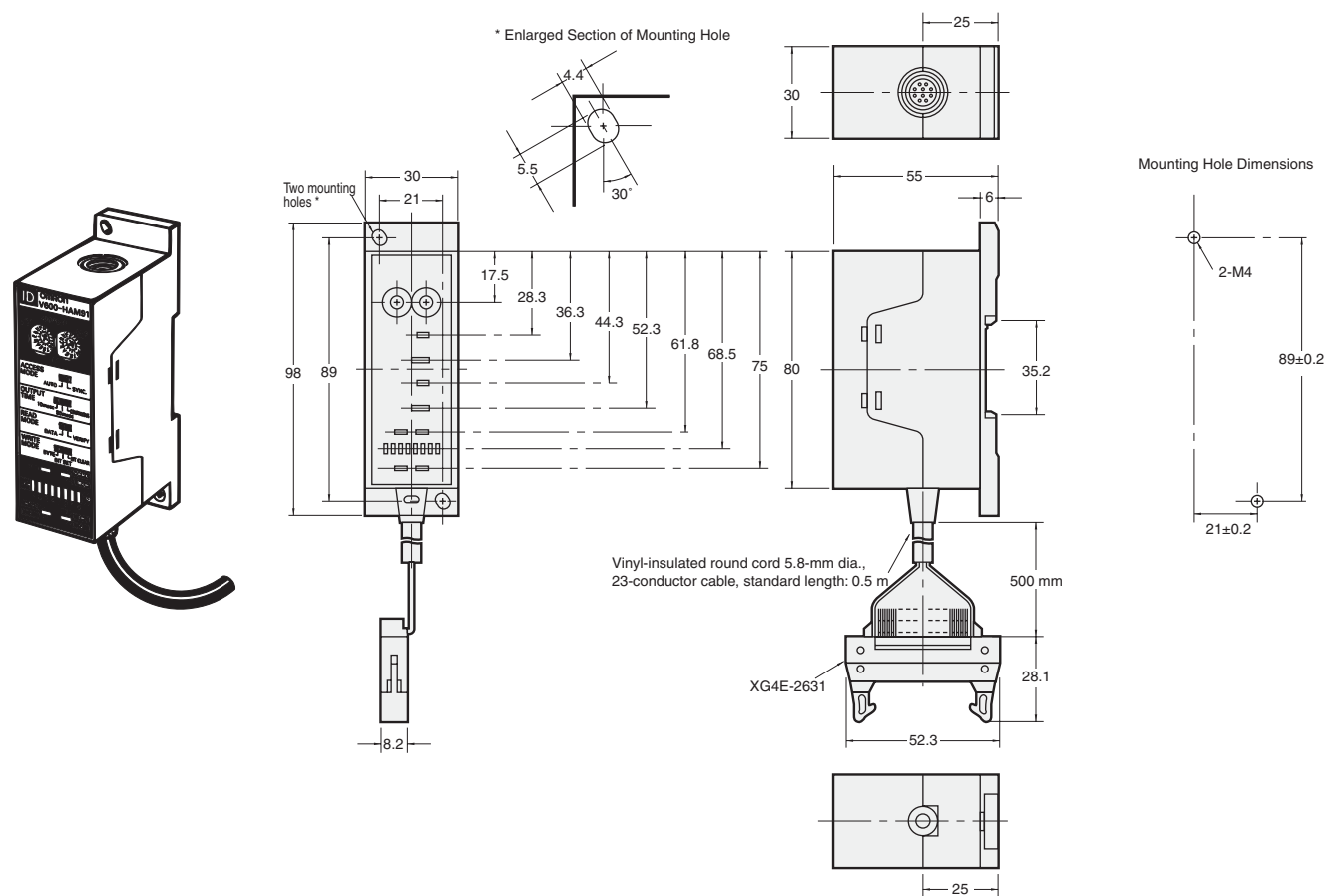
Note: All units are in millimeters unless otherwise indicated.

Amplifier

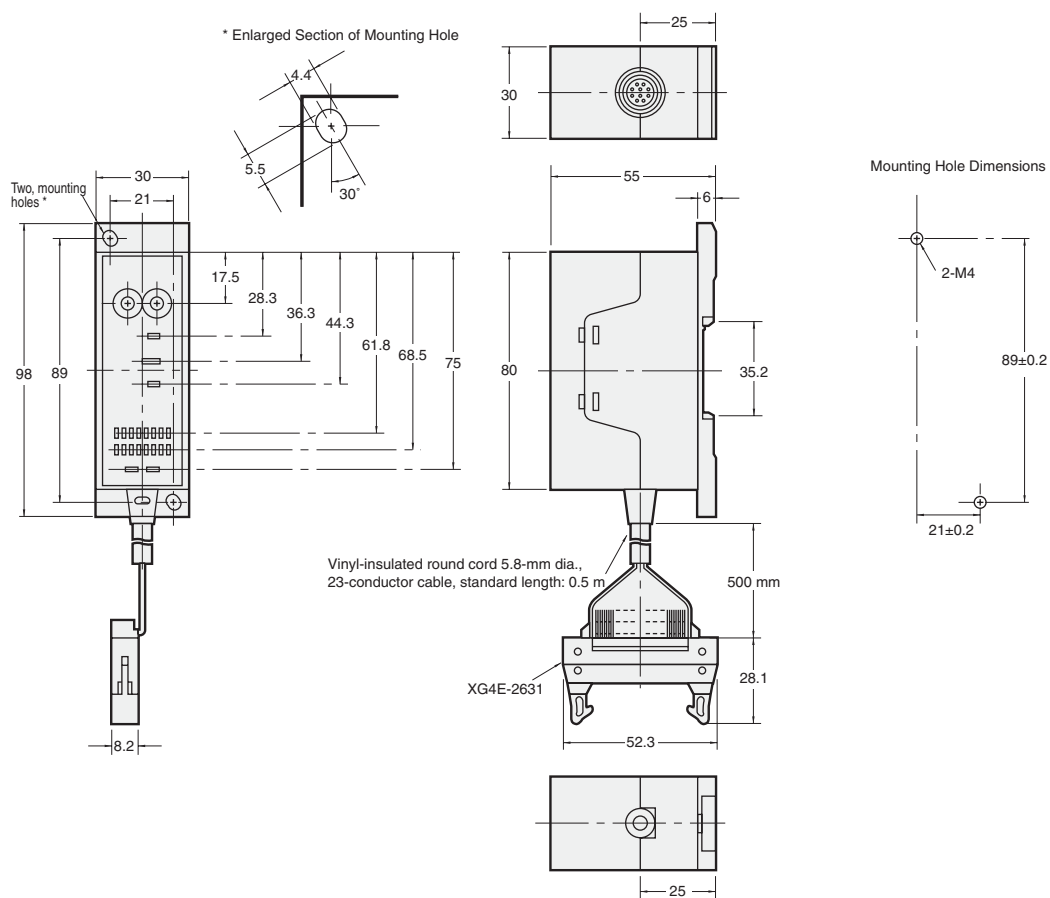
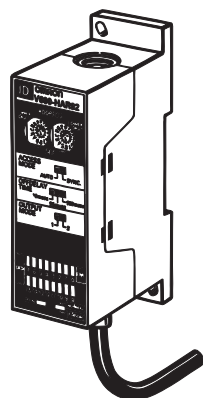
V600-HAR91/-HAR81



V600-HAM91/-HAM81

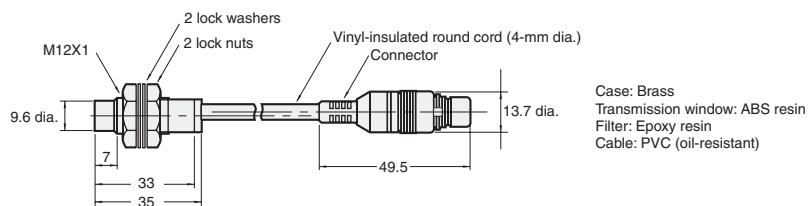


V600-HAR92

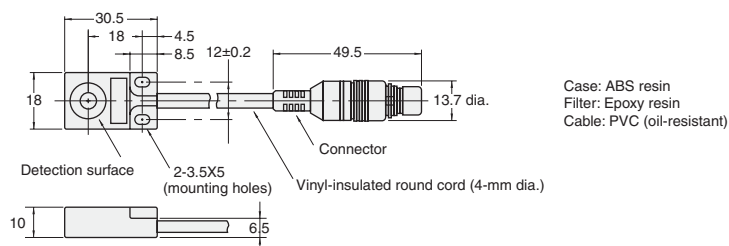
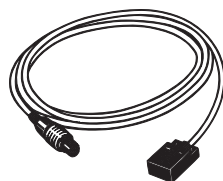


Sensor

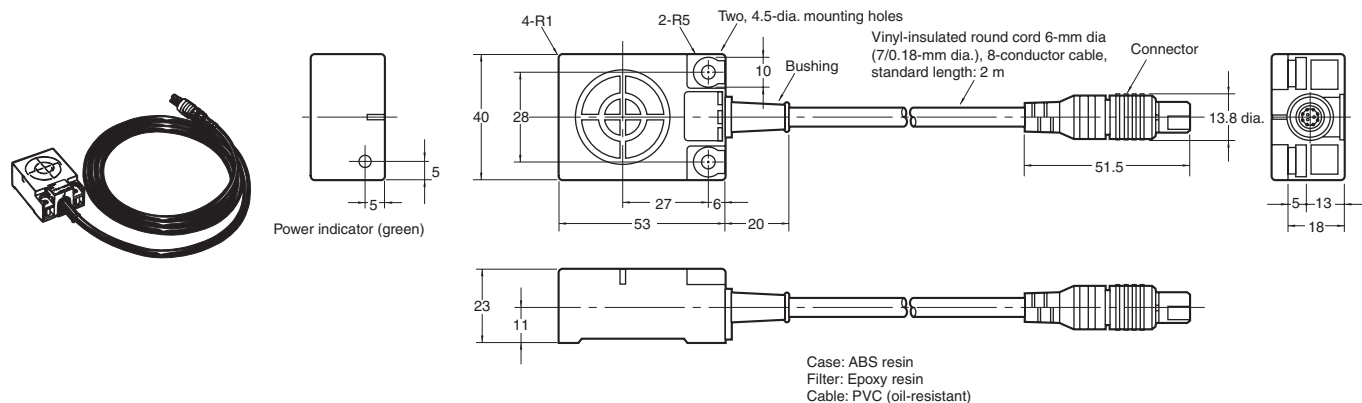
V600-HS51



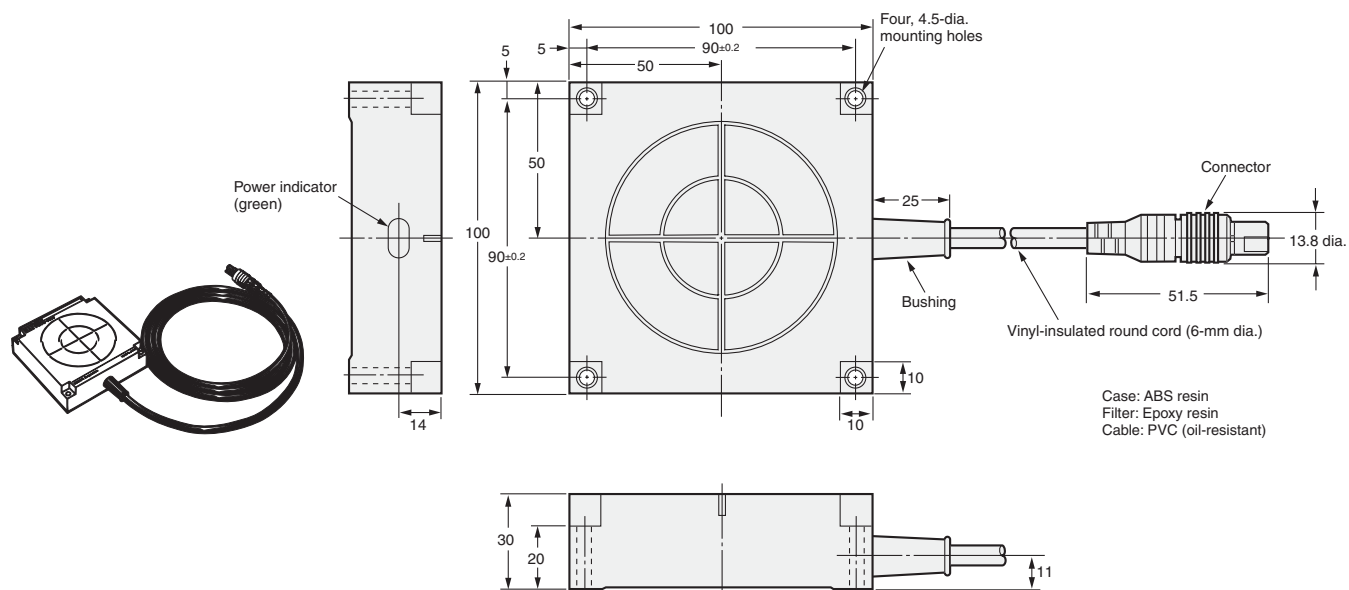
V600-HS61



V600-HS63

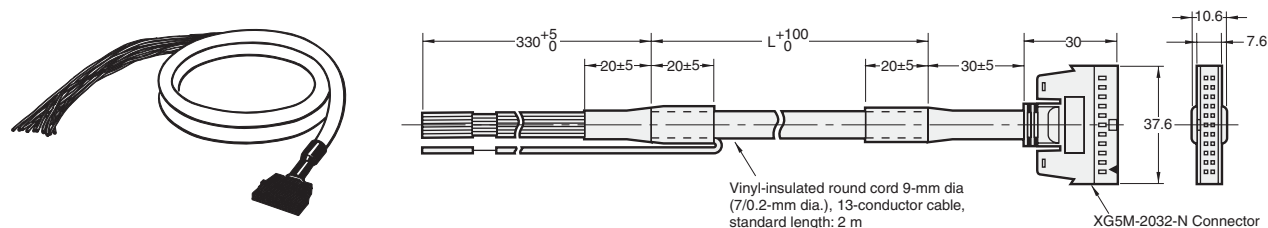


V600-HS67

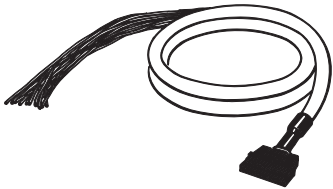


Interface Cable

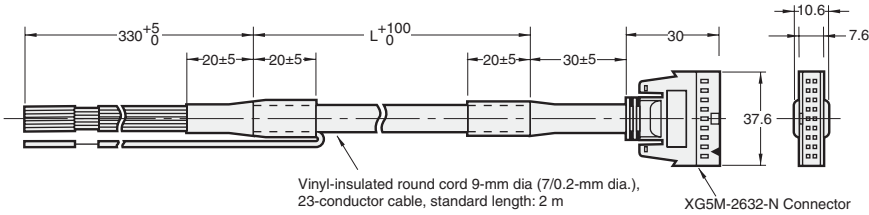
V600-A6□R (for V600-HAR91/-HAR81))



V600-A6□M (for V600-HAM91/-HAM81/-HAR92)



Model	L (m)
V600-A60R/60M	2
V600-A61R/61M	5
V600-A62R/62M	10



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- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
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ALL DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters into inches, divide by 25.4

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Intelligent Flag II

V600-HAM42-DRT

Employs Innovative Electronic ID Flags to Replace Mechanical Flags and Offers DeviceNet Compatibility

- Conforms to DeviceNet standards.
- Uses the same main functions (Read, Write, Bit Set, Bit Clear, etc.) as those of the V600-HA Intelligent Flag Series.
- Responds flexibly to applications with data reading up to 24 bits.
- Allows data to be written in units of up to 16 bits.







CE

Ordering Information/Specifications

■ Amplifier

Item	V600-HAM42-DRT
Communications power supply voltage	11 to 25 VDC (provided from communications connector)
Internal circuit power supply voltage	18 to 26.4 VDC
Internal current consumption	Communications power supply: 40 mA max. Internal circuit power supply: 150 mA max.
Noise immunity	Internal circuit power supply normal: ± 600 V Internal circuit power supply common: $\pm 1,500$ V
Dielectric strength	50/60 Hz at 500 VAC for 1 minute; leakage current 10 mA max.
Vibration resistance	10 to 55 Hz, 1.5-mm double amplitude, with 4 sweeps of 8 min each in 3 directions
Shock resistance	294 m/s ² , 3 times each in 3 directions (18 times total)
Ambient temperature	0 to 55°C (with no icing)
Ambient humidity	35% to 85% RH (with no condensation)
Storage temperature	-25 to 65°C
Degree of protection	IEC 60529: IP20 (panel mounted)
Mounting method	DIN track or direct mounting using accessory fittings (M4 screws)
Weight	Approx. 150 g

■ Sensor

Item	Model Shape	V600-HS51	V600-HS61	V600-HS63	V600-HS67
					
Oscillation frequency	530 kHz				
Ambient temperature	-10 to 60°C			-10 to 70°C	
Storage temperature	-25 to 75°C				
Ambient humidity	35% to 95%				
Insulation resistance	50 MΩ (at 500 V DC) between cable terminal and case				
Dielectric strength	1,000 V AC, 50/50 Hz for 1 min between cable terminal and cable (leakage current 1 mA max.)				
Degree of protection	IEC 60529: IP67				
Vibration resistance	10 to 2,000 Hz, 3-mm double amplitude, with 2 sweeps of 15 min each in 3 directions			10 to 500 Hz, 2-mm double amplitude, with 3 sweeps of 11 min each in 3 directions	
Shock resistance	981 m/s ² , 3 times each in 3 directions (18 times total)			490 m/s ² , 3 times each in 3 directions (18 times total)	
Cable length	2 m (fixed)				
Wireless transmission error direction	16-bit CRC (Cyclic Redundancy Check) in both directions				
Indicator	---			Power: green	
Weight	Approx. 70 g			Approx. 190 g	Approx. 540 g

■ Performance

Number of Master words		Input: 2; output: 2 (total: 4 words)
Number of sensor connections		1 channel
Applicable sensors		V600-HS51, V600-HS61, V600-HS53, V600-HS67
Read	DATA READ mode	Read 24 bits of data from the set address
Write	BYTE mode	Write 8-bit or 16-bit data from the set address
	BIT SET mode	Set (write "1") only the data for the bits that are set (with "1") at the set address
	BIT CLEAR mode	Clear (write "0") only the data for the bits that are set (with "1") at the set address

■ Transmission Distance Specifications

Amplifier Sensor		V600-HAM42-DRT			
		V600-HS51	V600-HS61	V600-HS63	V600-HS67
Memory EEP-ROM Type Data Carrier	V600-D23P53	0.5 to 3.0 mm	0.5 to 3.0 mm	---	---
	V600-D23P54	0.5 to 5.0 mm	0.5 to 5.5 mm	---	---
	V600-D23P55	0.5 to 7.0 mm	0.5 to 7.0 mm	---	---
	V600-D23P61	0.5 to 8.0 mm	0.5 to 9.0 mm	2 to 16 mm	---
	V600-D23P66N	---	---	5 to 30 mm	5 to 35 mm
	V600-D23P66SP	---	---	5 to 25 mm	5 to 30 mm
	V600-D23P71	---	---	5 to 35 mm	10 to 65 mm
	V600-D23P72	---	0.5 to 18 mm	5 to 35 mm	10 to 45 mm
Memory S-RAM Type Data Carrier	V600-D8KR12	5 to 15 mm	5 to 18 mm	5 to 45 mm	10 to 50 mm
	V600-D2KR16	---	---	2 to 15 mm	---
	V600-D8KR04	---	---	10 to 65 mm	10 to 90 mm

Note: 1. Sensor installation conditions

- V600-HS51: When flush-mounted in iron
Axial offset from the Data Carrier: ± 2.0 mm
- V600-HS61: When surface-mounted on metal (ferrous)
Axial offset from the Data Carrier: ± 2.0 mm
- V600-HS63: When surface-mounted on metal (ferrous)
Axial offset from the Data Carrier: ± 10.0 mm
- V600-HS67: When surface-mounted on metal (ferrous)
Axial offset from the Data Carrier: ± 10.0 mm

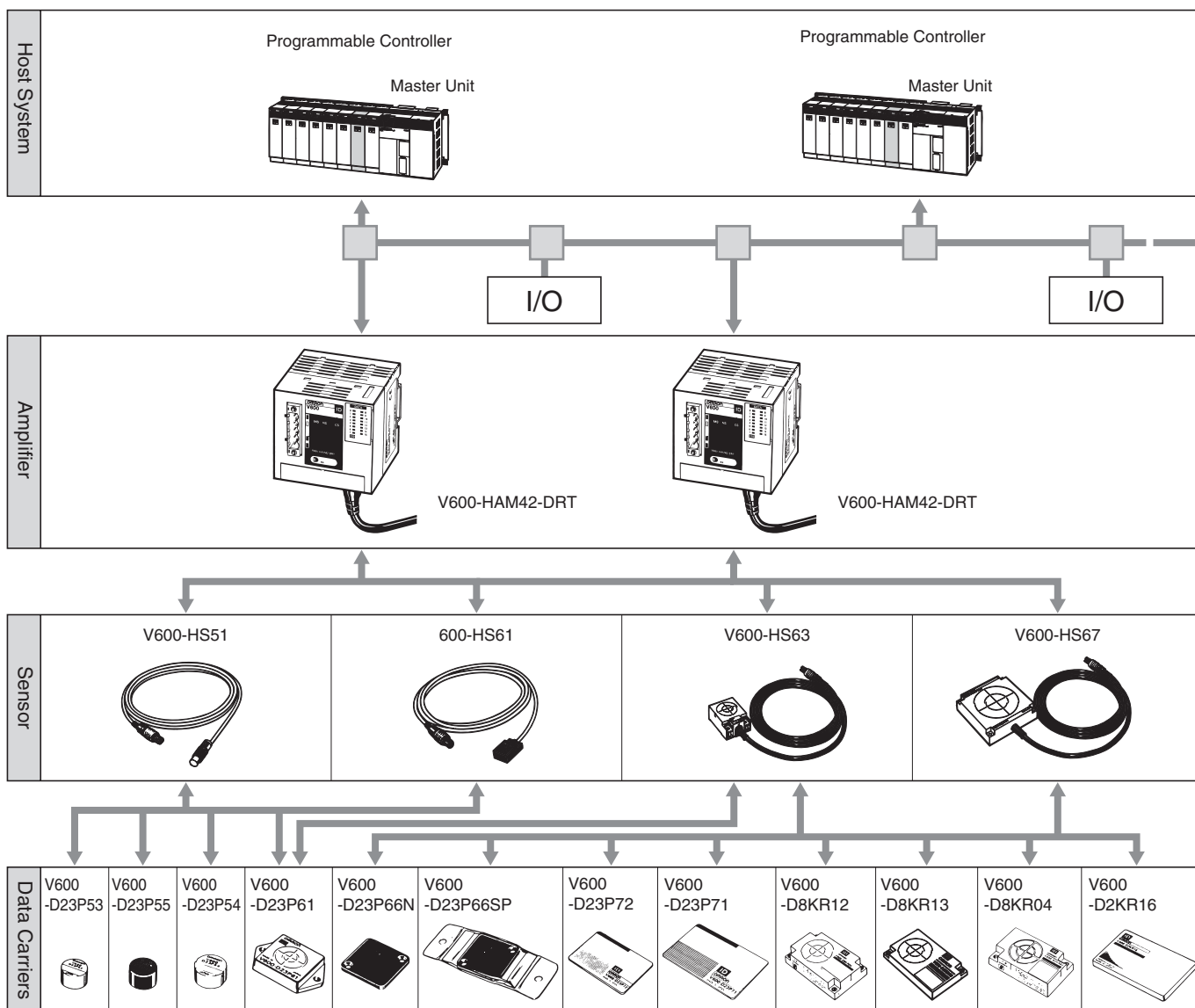
2. Data Carrier installation conditions

- V600-D23P53/-P54: When flush-mounted in iron
- V600-D23P55: When flush-mounted in iron, the transmission distance decreases greatly.
- V600-D23P66N/-P66SP/-P71/-P72: When surface-mounted on resin (no metal on the backside)
- V600-D23P61: When surface-mounted on metal (ferrous)
- V600-D8KR12/04: When surface-mounted on metal (ferrous)
- V600-D2KR16: When the Data Carrier attached to the holder is mounted on metal (ferrous)

3. The transmission distance specified in the specifications is also applicable when the Data Carrier is mounted on non-metallic surfaces.

4. The Data Carrier is stationary.

System Configuration



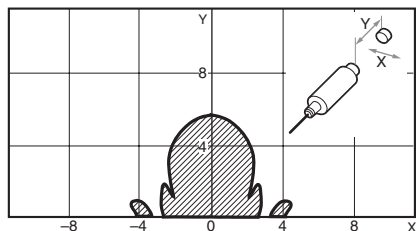
Characteristic Data (Typical)

■ Transmission Range

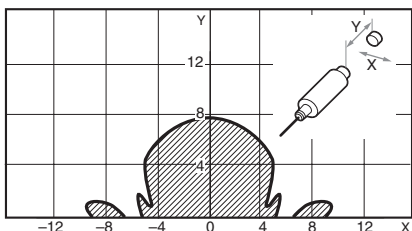
Note: All units are in millimeters unless otherwise indicated.

Combinations with the V600-HS51 Sensor

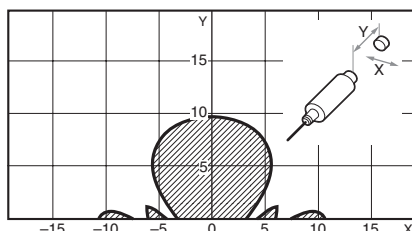
V600-HS51 & V600-D23P53



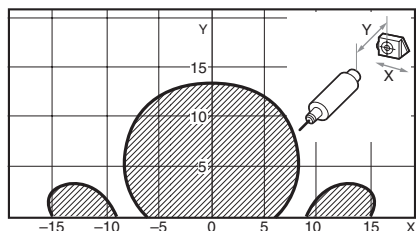
V600-HS51 & V600-D23P54



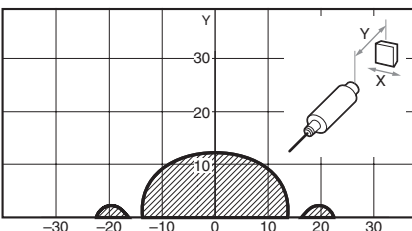
V600-HS51 & V600-D23P55



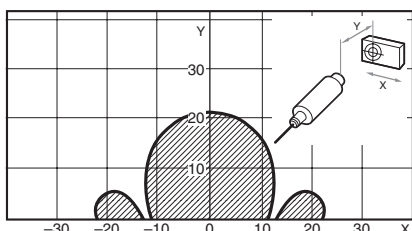
V600-HS51 & V600-D23P61



V600-HS51 & V600-D23P66N

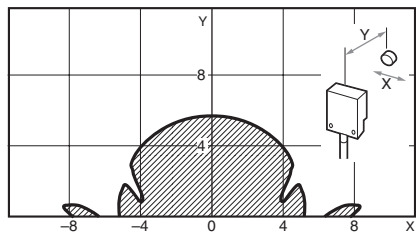


V600-HS51 & V600-D8KR12

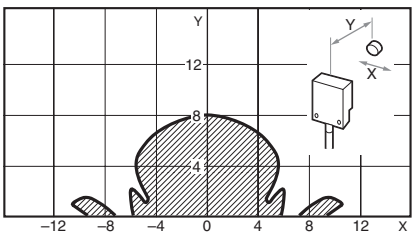


Combinations with the V600-HS61 Sensor

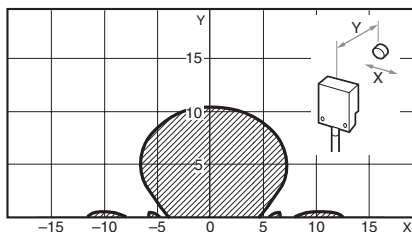
V600-HS61 & V600-D23P53



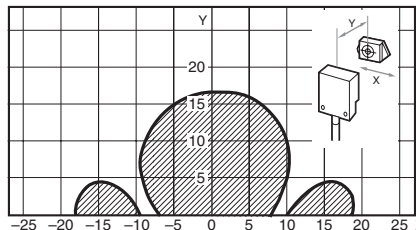
V600-HS61 & V600-D23P54



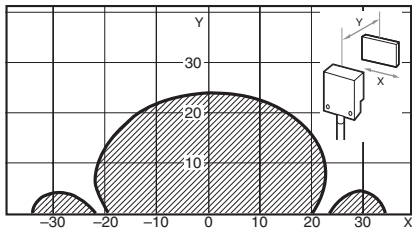
V600-HS61 & V600-D23P55



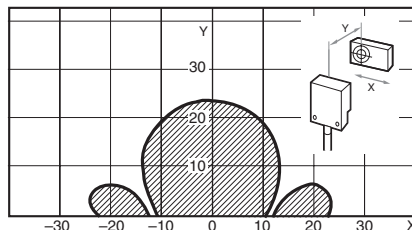
V600-HS61 & V600-D23P61



V600-HS61 & V600-D23P72

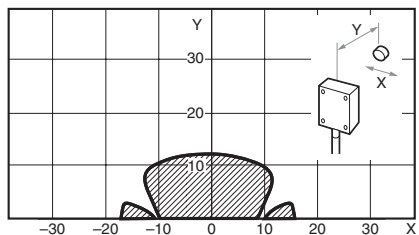


V600-HS61 & V600-D8KR12

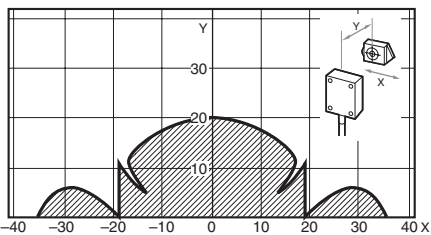


Combinations with the V600-HS63 Sensor

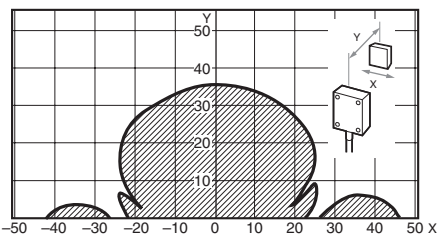
V600-HS63 & V600-D23P55



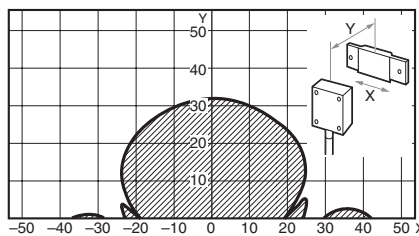
V600-HS63 & V600-D23P61



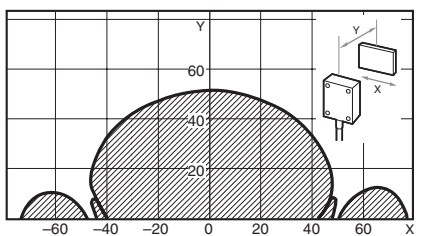
V600-HS63 & V600-D23P66N



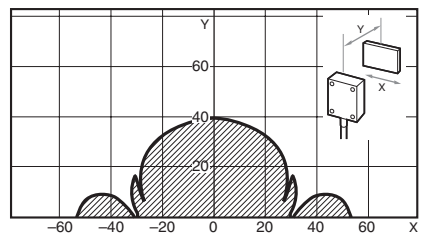
V600-HS63 & V600-D23P66SP



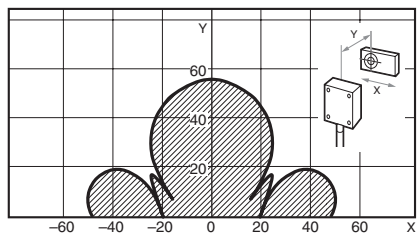
V600-HS63 & V600-D23P71



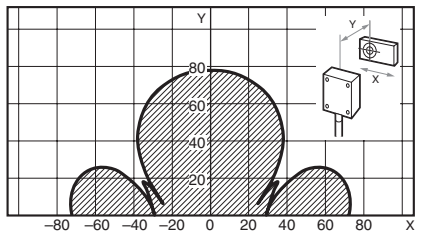
V600-HS63 & V600-D23P72



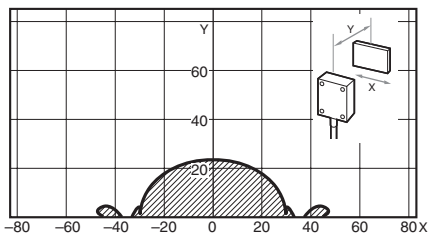
V600-HS63 & V600-D8KR12



V600-HS63 & V600-D8KR04

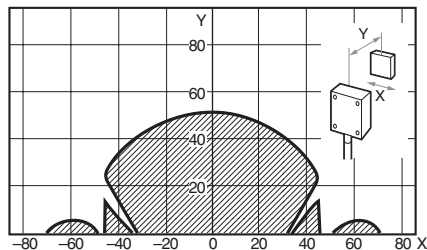


V600-HS63 & V600-D2KR16

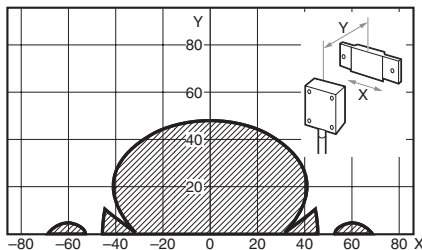


Combinations with the V600-HS67 Sensor

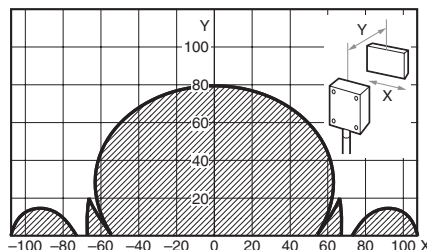
V600-HS67 & V600-D23P66N



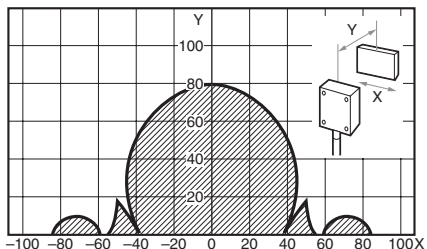
V600-HS67 & V600-D23P66SP



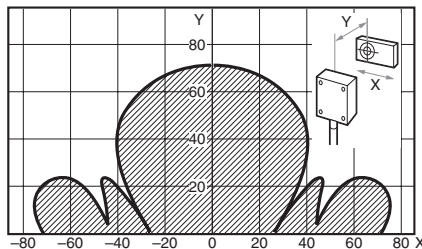
V600-HS67 & V600-D23P71



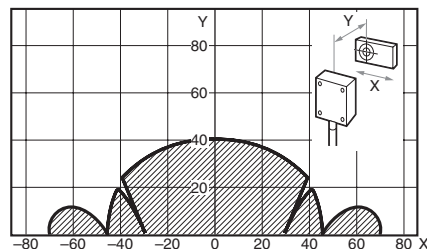
V600-HS67 & V600-D23P72



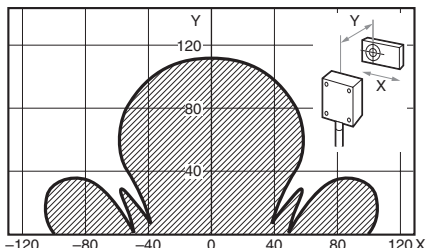
V600-HS67 & V600-D8KR12



V600-HS67 & V600-D8KR13



V600-HS67 & V600-D8KR04



Transmission Time

The transmission time is the time required for transmission between the Sensor and the Data Carrier.

Model		V600-HAM42-DRT		
		Read	Write	
		DATA READ mode	BYTE mode	BIT SET mode, BIT CLEAR mode
Data Carrier type	Battery-less type	79 ms	140 ms	152 ms
	Built-in battery type	64 ms	97 ms	109 ms

Battery-less type: V600-D23P53, V600-D23P55, V600-D23P54, V600-D23P61, V600-D23P66N, V600-D23P66SP, V600-D23P72, V600-D23P71

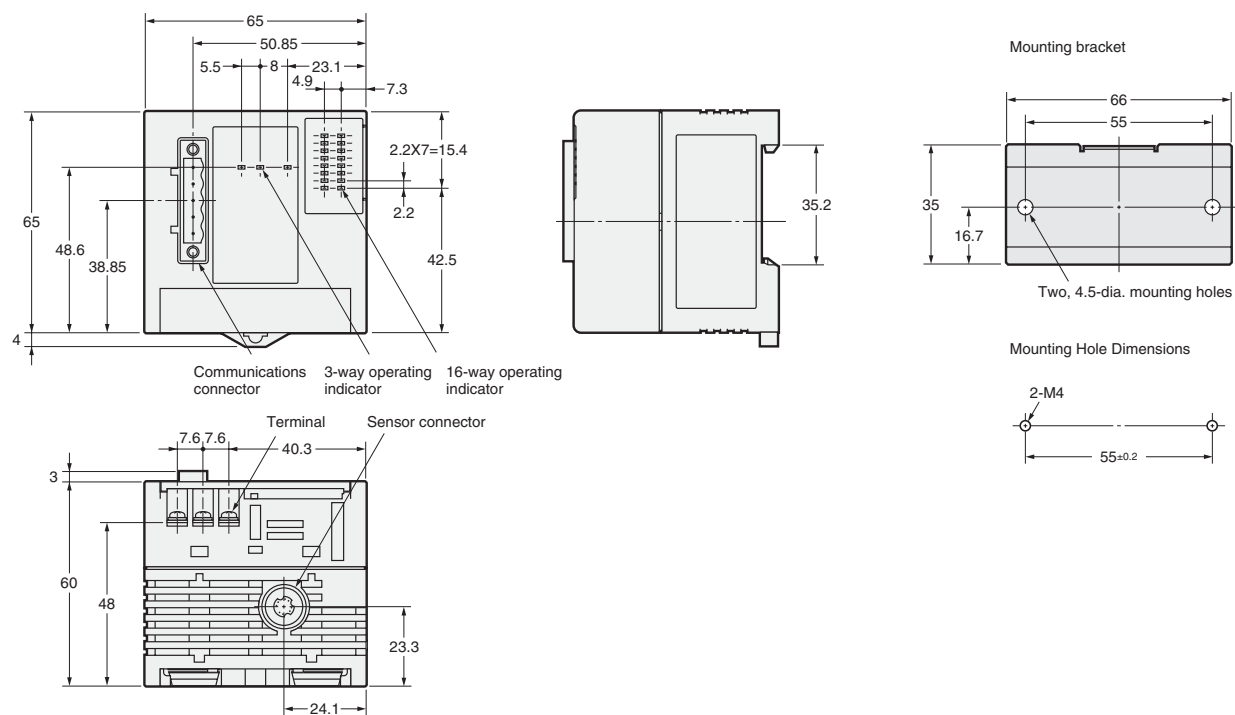
Built-in battery type: V600-D8KR12, V600-D8KR13, V600-D8KR04, V600-D2KR16

Dimensions

Note: All units are in millimeters unless otherwise indicated.

Amplifier

V600-HAM42-DRT



Sensor

- V600-HS51
- V600-HS61
- V600-HS63
- V600-HS67

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- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines and equipment that could present a risk to life or property.

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Electromagnetic Inductive RFID System

V670

High-Speed, Long-Life, Battery-less RFID System

- High-speed communications requiring only 14 ms to read or write 128 bytes of data.
- Long-life battery-free tags to read and write data 1,000 million times.
- Versatile functions, such as auto repeat, repeat input trigger, and tag specification.
- Self-execution mode for data processing with no host controller intervention.







Note: The V670 conforms to the FCC Rules and EU Directives, allowing it to be used in a wide variety of countries. In other countries, it may be subject to radio regulations and EMC restrictions. Contact your Omron representative for details.



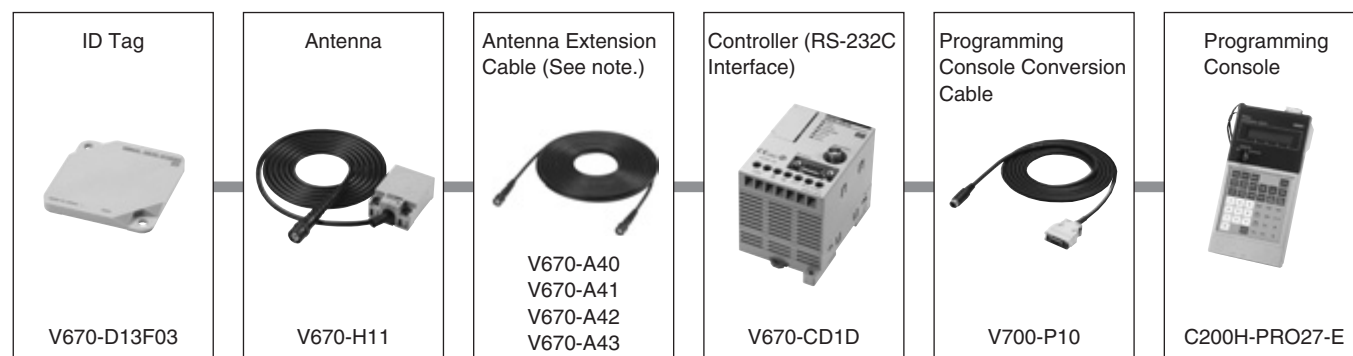
CE

Ordering Information

■ List of Models

Item		Description		Model
ID Tag		40 × 40 × 4.5 mm	128 bytes	V670-D13F03
Antenna		40 × 53 × 23 mm	2-m cable	V670-H11
Controller		90 × 66 × 75 mm	RS-232C interface operating at 24 VDC with a single antenna connector	V670-CD1D
Antenna Extension Cables		3 m	Material: Polyvinyl chloride Connectors are not watertight.	V670-A40
		10 m		V670-A41
		18 m		V670-A42
		28 m		V670-A43
Programming Console			Operation monitor, set value display, communications, test communications, and error log functions.	C200H-PRO27-E
Programming Console Conversion Cable		2 m	Connects the V670-CD1D and C200H-PRO27-E.	V700-P10

System Configuration



Note: When extending the antenna cable, do not use any cable other than the Antenna Extension Cables from OMRON.

Specifications

■ ID Tags

Item	V670-D13F03
Memory capacity	128 bytes
Memory type	FeRAM
Memory life	Number of accesses: 1,000 million times (See note.)
Data storage time	10 years (after the data is written or read)
Ambient temperature	Operating: -10 to 70°C
Ambient temperature	Storage: -10 to 70°C
Ambient humidity	Operating: 35% to 85%
Degree of protection	IEC60529 IP67
Vibration resistance	10 to 2,000 Hz, 1.5-mm double amplitude at 150 m/s ² acceleration with 10 sweeps in X, Y, and Z directions for 15 minutes each
Shock resistance	500 m/s ² in X, Y, and Z directions 3 times each (18 times in total)
Material	Filled with ABS/Epoxy resin
Weight	Approx. 6 g

Note: The number of accesses is the total number of read or write communications.

■ Antenna

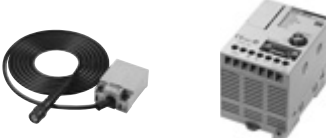

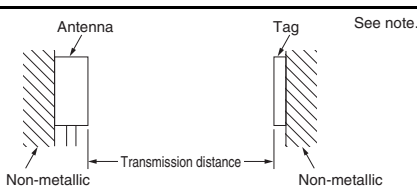
Item	V670-H11
Oscillation frequency	13.56 MHz
Ambient temperature	Operating: -10 to 70°C
Ambient humidity	Operating: 35% to 85%
Ambient temperature	Storage: -25 to 85°C
Ambient humidity	Storage: 35% to 85%
Insulation resistance	20 MΩ min. (at 1,000 VDC) between the terminals and case
Dielectric strength	1,000 VAC for 1 minute between the terminals and case with a current leakage of 1 mA
Degree of protection	IEC60529 IP67
Vibration resistance	10 to 150 Hz, 0.7-mm double amplitude at 50 m/s ² acceleration with 10 sweeps in X, Y, and Z directions for 8 minutes each
Shock resistance	150 m/s ² in X, Y, and Z directions 3 times each (18 times in total)
Material	Filled with ABS/Epoxy resin
Cable length	2 m
Weight	Approx. 160 g

Note: The connector is not watertight.

■ Controller

Item	V670-CD1D
Host interface type	RS-232C
Number of connectable antennas	1
Power supply voltage	24 VDC $\pm 10\%$
Power consumption	7 W max.
Ambient temperature	Operating: 0 to 55°C (with no icing)
Ambient humidity	Operating: 35% to 85% (with no condensation)
Ambient temperature	Storage: -20 to 75°C (with no icing)
Ambient humidity	Storage: 35% to 85% (with no condensation)
Insulation resistance	20 M Ω min. (at 1,000 VDC) 1. Between ground terminal and both power supply terminals 2. Between both power supply terminals and both output terminals 3. Between both power supply terminals and case 4. Between both output terminals and ground terminal 5. Between both output terminals and case 6. Between ground terminal and case
Dielectric strength	1,000 VAC for 1 minute in all the above combinations with a maximum leakage current of 5 mA
Degree of protection	Panel mounted
Vibration resistance	10 to 150 Hz, 0.2-mm double amplitude at 15 m/s ² acceleration with 10 sweeps in X, Y, and Z directions for 8 minutes each.
Shock resistance	150 m/s ² in X, Y, and Z directions 3 times each (18 times in total)
Ground	Ground at a resistance of less than 100 Ω
Material	PC/ASA resin
Weight	Approx. 270 g

■ Transmission Distance Specifications

Antenna/Controller	ID Tag	Transmission distance (mm)		Measurement conditions	
		Without Extension Cable	With Extension Cable		
<div>V670-H11 + V670-CD1D</div> <div></div>	<div>V670-D13F03</div> <div></div>	5.0 to 23.0 (axial offset: ±1)	A40 (3 m)	5.0 to 21.5	<div></div>
			A41 (10 m)	5.0 to 21.0	
			A42 (18 m)	5.0 to 20.5	
			A43 (28 m)	5.0 to 20.0	

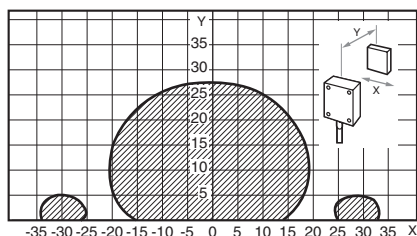
Note: 1. When the background object of the antenna is metal, the communications area is almost the same. If the tag is attached on metal without a gap, no communications will be possible. For details, refer to the *V670 User's Manual* (Z148-E1).

2. The transmission distance is reduced if an Extension Cable is used. Also, the transmission distance varies with the type of Extension Cable.

Characteristic Data (Typical)

Transmission Range

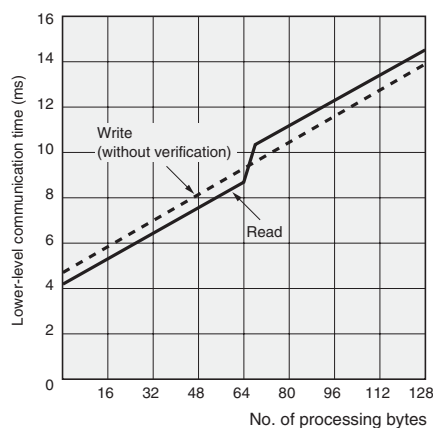
Combination of V670-H11 and V670-D13F03



Note: The above data applies only if an Extension Cable is not used.

Transmission Time (Reference)

Communications time is a period required for communications between the antenna and ID Tag.



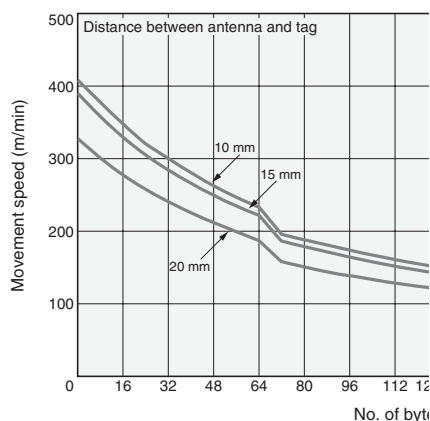
Operation	No. of bytes	Calculation formula
Read	1 to 64 bytes	$T = 0.07 \times N + 4.22$
	65 to 128 bytes	$T = 0.07 \times N + 5.64$
Write	1 to 128 bytes	$T = 0.07 \times N + 4.72$

Note: N: Number of bytes
T: Communications time (ms)

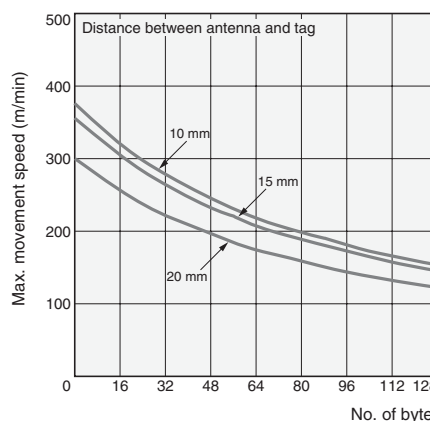
Movement Speed (Reference)

Tag movement speed must be a maximum of 50% of the maximum movement speed according to the number of processing bytes to ensure the reliability of communications. Conduct proper on-site tests to determine the tag movement speed. (The following data applies only if an Extension Cable is not used.)

Read



Write



Precautions

Standard Conformity

The V670 conforms to the following standards.

FCC Rules (Federal Communications Commission)

This Product Complies with Part 15 Subpart C of the FCC Rules.
FCC ID: E4E6CYCIDV6700101

EC Declaration of Conformity

Hereby, OMRON Corporation declares that this RFID System, V670-H11 Antenna, and V670-CD1D Controller are in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC, and satisfy tests for the appropriate requirements on the following relevant standards.

Radio: EN 300 330 V1.2.1 (May 1999)

EMC: EN 301 489-3 (EN 301 489-1)

Safety: EN 61010-1: 1993+A2

Countries of intended use:

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom

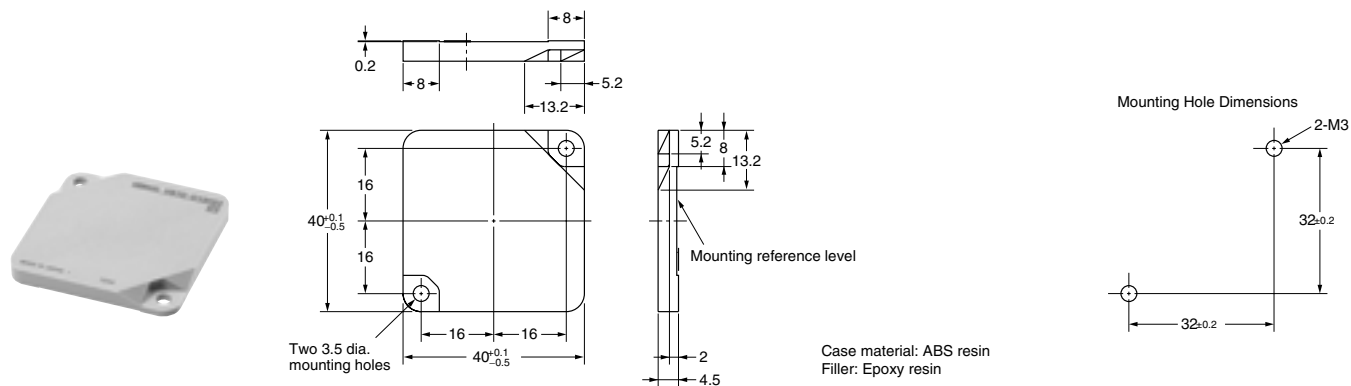


Dimensions

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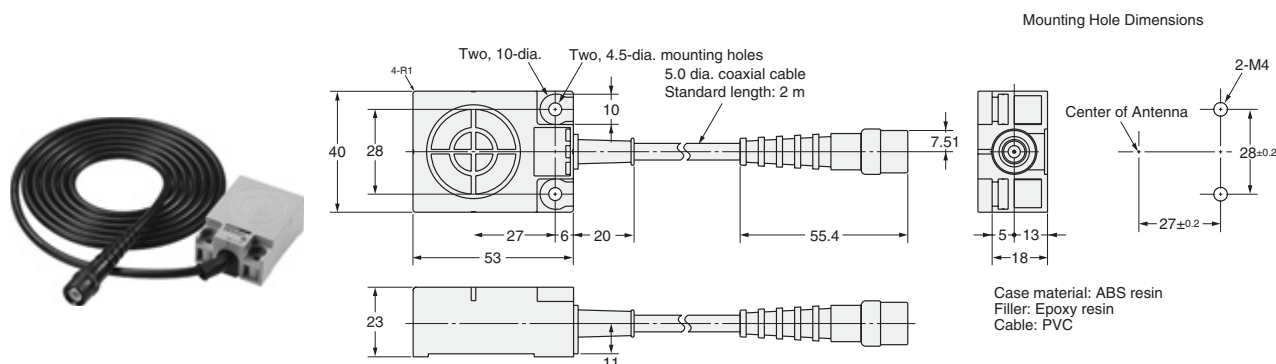
ID Tag

V670-D13F03



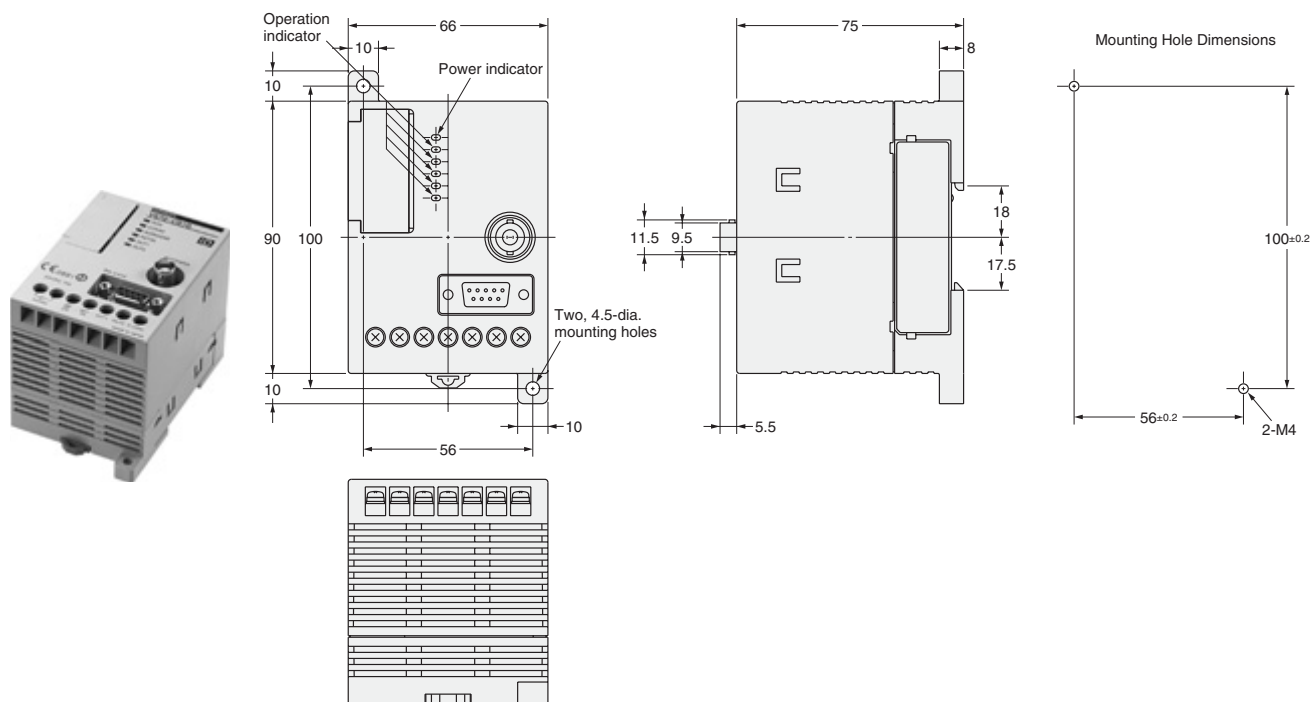
Antenna

V670-H11



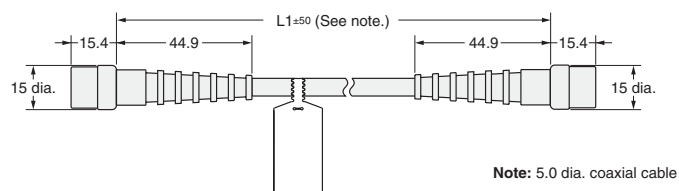
Controller

V670-CD1D



Extension Cables

V670-A40/A41/A42/A43



Model	Length
V670-A40	3 m
V670-A41	10 m
V670-A42	18 m
V670-A43	28 m

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

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Electromagnetic Inductive RFID System

V700






V700 System Offers Enhanced Functionality and High-Performance to Revolutionize Product and Distribution Management in the Production Environment












- A long transmission distance and a wide transmission range allow position displacement and axial offset of ID Tags to be handled easily.
- Reading and writing are possible with several ID Tags in the Antenna's transmission range for use in a wider range of new applications.
- Easy-to-use, reasonably-priced ID Tags mean low-cost systems, even in applications using a large number of Tags.
- A Compact Reader/Writer, the V700-HMD11(-1), is now available.
- The lineup includes an ID Link Unit that is compatible with multi-drop connections and RS-485 interfaces.
- The V700-HMD11-1 Compact Reader/Writer can be connected directly to the ID Link Unit or to an Omron PLC, without an AC Adapter.



Ordering Information



■ List of Models

Item	Description		Model	
ID Tag	20 dia. × 2.7 mm	Coin-shaped 128 bytes (with user area of 112 bytes)		V700-D13P31
	3.9 dia. × 25 mm	Stick-shaped 256 bytes (with user area of 240 bytes)		V700-D23P41
ID Tag Holder	Special holder for the V700-D13P31 (There is no ID Tag provided with the product.)			V700-A80
Antenna	250 × 200 × 35 mm	100-mm cable		V700-H01 (Standard Antenna)
	650 × 200 × 35 mm	100-mm cable		V700-H02 (Wide-field Antenna)



Item	Description		Model	
Controller	90 × 65 × 75 mm	RS-232C interface 24 VDC, 1 channel for Antenna connection		V700-CD1D-V3
		RS-485 interface Maximum number of Controllers that can be connected: 31 24 VDC, 1 channel for Antenna connection		V700-CD2D-V3
Antenna Cable	2 m	Material: Vinyl chloride The connector is not waterproof.		V700-A40
	3 m			V700-A41
	5 m			V700-A42
	10 m			V700-A43
	20 m			V700-A44
	30 m			V700-A45
Compact Reader/Writer	40 × 53 × 23 mm	RS-232C interface 5 VDC supplied via AC Adapter 2-m cable		V700-HMD11
		RS-232C interface 5 VDC supplied via AC Adapter for V700-L12 and CPM2C PLCs		V700-HMD11-1
		1-m cable 2-m cable 4-m cable		
Compact Flash Type Reader/Writer	52 × 59 × 12 mm	Compact Flash Type 2 PDA interface; 3.3 VDC from internal battery		V705-HMF01
PCB Type Reader/Writer Modules	80 × 80 × 5 mm	C-MOS interface		V700-HMC71
	40 × 44 × 10 mm	C-MOS interface		V700-HMC73
ID Link Unit	110 × 65 × 64 mm	RS-232C and RS-485 interface Unit for multiple connections		V700-L12
Programming Console		Equipped with the following functions: Execution status monitor, set value display, transmission execution, transmission test, noise measurement, reading error contents		C200H-PRO27-E
Programming Console Connecting Cable	2 m	Cable for connecting the V700-CD□D-V□ and C200H-PRO27-E		V700-P10

Specifications



■ ID Tags

Item	Model	
	V700-D13P31 	V700-D23P41 
Memory capacity	112 bytes (user area)	240 bytes (user area)
Memory type	EEPROM	
Data backup time	10 years after data written	
Data writing times	100,000 times per address	
Ambient operating temperature (during transmission)	-20 to 70°C (with no icing)	-25 to 70°C (with no icing)
Ambient operating temperature (not during transmission)	-40 to 110°C (with no icing). Heat resistance: Constant high temperature: 180°C for 200 hours Thermal cycle: 25°C/180°C, 30 minutes, 200 cycles	-40 to 110°C (with no icing)
Ambient storage temperature	-40 to 110°C (with no icing)	
Ambient operating humidity	No restrictions	35% to 95% (with no condensation)
Degree of protection	IEC60529: IP68	IEC60529: IP67
Vibration resistance	10 to 2,000 Hz, 0.75-mm single amplitude, 150-m/s ² acceleration with 10 sweeps of 15 min each in X, Y, and Z directions	
Shock resistance	500-m/s ² acceleration 3 times each in X, Y, Z directions (18 times total)	
Material	PPS resin	Case: PBT resin; Filling: Epoxy resin
Weight	Approx. 2 g	Approx. 1 g


■ Controllers

Item	Model	
	V700-CD1D-V3 	V700-CD2D-V3 
Host interface	RS-232C	RS-485 (Up to 31 Controllers can be connected.)
Number of connectable Antennas	1	
Power supply voltage	24 VDC +10%/-15%	
Power consumption	20 W max.	
Insulation resistance	20 MΩ min. (at 100 VDC) between the power supply terminals and ground terminal, power supply terminals and I/O terminals, power supply terminals and case, I/O terminals and ground terminal, I/O terminals and case, and ground terminal and case	
Dielectric strength	500 VAC (50/60 Hz, 1 minute) between the above terminals (leakage current: 10 mA max.)	
Vibration resistance	10 to 150 Hz, 0.30-mm double amplitude with 4 sweeps of 8 min each in X, Y, and Z directions	
Shock resistance	200-m/s ² acceleration for 3 times each in X, Y, and Z directions (18 times in total)	
Ambient operating temperature	-10 to 55°C (with no icing)	
Ambient operating humidity	35% to 85% (with no condensation)	
Ambient storage temperature	-25 to 65°C (with no icing)	
Ambient storage humidity	35% to 95% (with no condensation)	
Degree of protection	IEC60529: IP30 (panel mounted)	
Ground	Ground at a resistance of less than 100 Ω. If grounding is not performed properly, transmission specifications may be adversely affected by the surrounding environment.	
Weight	Approx. 290 g	


■ Antennas

Item	Model	
	 V700-H01	 V700-H02
Oscillation frequency	125 kHz	
Insulation resistance	20 MΩ min. (at 500 VDC) between the cable terminals and the case	
Dielectric strength	1,000 VAC (50/60 Hz, 1 minute) between the cable terminals and the case (leakage current: 1 mA max.)	
Vibration resistance	10 to 150 Hz, 1.50-mm double amplitude with 2 sweeps of 8 min each in X, Y, and Z directions	
Shock resistance	300-m/s ² acceleration for 3 times each in X, Y, and Z directions (18 times in total)	
Ambient operating temperature	-20 to 55°C (with no icing)	
Ambient storage temperature	-35 to 65°C (with no icing)	
Ambient operating humidity	35% to 85% (with no condensation)	
Ambient storage humidity	35% to 95% (with no condensation)	
Degree of protection	IEC60529: IP40 (except connector)	
Material	Case: PC/ASA resin; Rear panel: Phenol resin; PVC (The connector is not resistant to water or oil.)	
Cable length	Maximum connection distance: 50.1 m using extension cable.	
Weight	Approx. 800 g	Approx. 1,760 g


■ Compact Reader/Writers

Item	Model	
	 V700-HDM11	 V700-HMD11-1 (requires V700-L12)
Host interface	RS-232C	
Power consumption	5 VDC ±5% (supplied via V600-A20 AC Adapter) Oscillating: 200 mA max.; Not oscillating: 25 mA max.	5 VDC ±5% (supplied via connector) 250 mA max.
Insulation resistance	50 MΩ min. (at 500 VDC) between the cable terminals and the case	
Dielectric strength	1,000 VAC (50/60 Hz, 1 minute) between the cable terminals and the case (leakage current: 1 mA max.)	
Vibration resistance	10 to 150 Hz, 1.50-mm double amplitude with 4 sweeps of 8 min each in X, Y, and Z directions	
Shock resistance	300-m/s ² acceleration for 3 times each in X, Y, and Z directions (18 times in total)	
Ambient operating temperature	-10 to 55°C (with no icing)	
Ambient operating humidity	25% to 85% (with no condensation)	
Ambient storage temperature	-25 to 65°C (with no icing)	
Ambient storage humidity	25% to 95% (with no condensation)	
Degree of protection	IEC60529: IP67 The connector is not resistant to water or oil.	
Material	Case: ABS resin; Filling: Epoxy resin; Cable: PVC (oil-resistant)	
Cable length	2 m (RS-232C signal lines can be extended up to a total length of 15 m.)	1, 2, 4 m
Weight	Approx. 210 g	Approx. 210 g (2 m)

■ ID Link Unit

Item	V700-L12 
Host interface	RS-232C or RS-485 (special 1:N protocol)
Number of connectable Antennas	1
Power supply voltage	24 VDC +10%/–15%
Power consumption	10 W max.
Insulation resistance	50 MΩ min. (at 500 VDC) between the power supply terminals and the ground terminal
Dielectric strength	1,000 VAC (50/60 Hz, 1 minute) between the power supply terminals and the ground terminal (leakage current: 5 mA max.)
Vibration resistance	10 to 150 Hz, 0.20-mm double amplitude, 15-m/s ² acceleration with 10 sweeps of 8 min each in X, Y, and Z directions
Shock resistance	150-m/s ² acceleration for 3 times each in X, Y, and Z directions (18 times in total)
Ambient operating temperature	0 to 40°C (with no icing)
Ambient operating humidity	35% to 85% (with no condensation)
Ambient storage temperature	–15 to 50°C (with no icing)
Ambient storage humidity	35% to 85% (with no condensation)
Degree of protection	IEC60529: IP20
Ground	Ground at a resistance of less than 100 Ω. If grounding is not performed properly, transmission specifications may be adversely affected by the surrounding environment.
Weight	Approx. 185 g

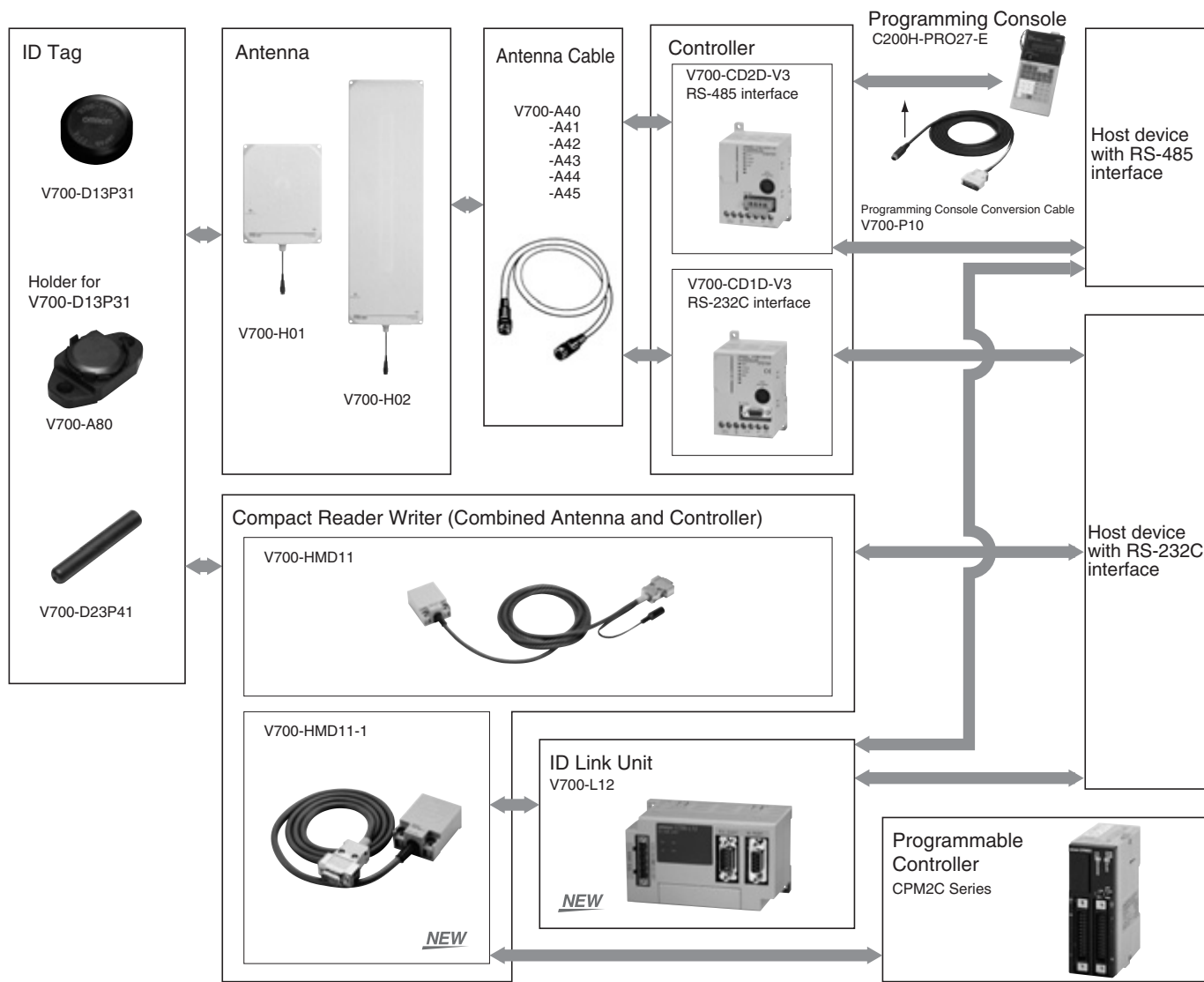
■ ID Tag Holder (for V700-D13P31 Coin-Shaped ID Tag)

Item	V700-A80 
Ambient storage temperature	Conforms to the specifications for the V700-D13P31 Coin-shaped ID Tag.
Ambient operating humidity	No restrictions
Material	PPS resin
Weight	Approx. 5 g

■ Communications Distance (Reference Values)

Item	ID Tag	Communications distance
Using the V700-H01/H02	V700-D13P21	0 to 250 mm
	V700-D13P31	
	V700-D23P41	
Using the V700-H01/H02	V700-D13P21	8 to 43 mm
	V700-D13P31	
	V700-D23P41	
Using the V700-H01/H02	V700-D13P21	0 to 63 mm
	V700-D13P31	
	V700-D23P41	
Using the V700-H01/H02	V700-D13P21	0 to 45 mm
	V700-D13P31	
	V700-D23P41	

System Configuration



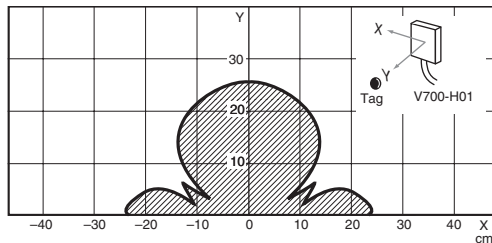
Note: The V700-CD1D-V3, V700-HMD11(-1), and V700-L12 all have different function and command structures.

Characteristic Data (Typical)

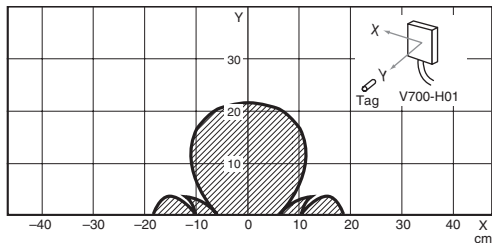
■ Transmission Range

Antenna Operation Range Graphs

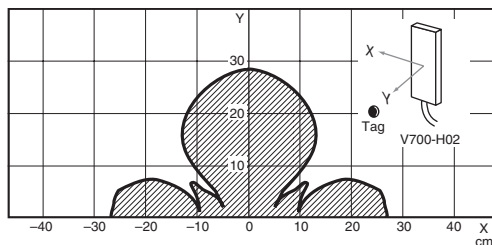
V700-H01 & V700-D13P31



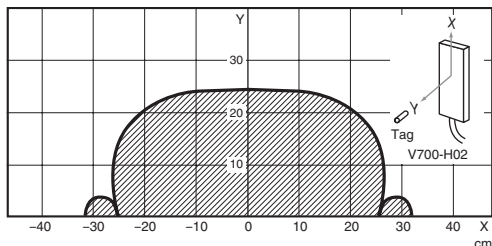
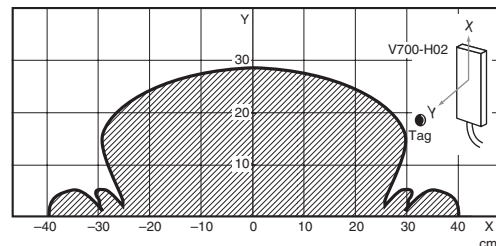
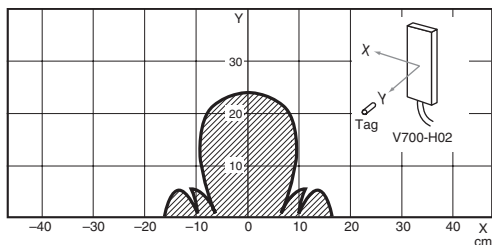
V700-H01 & V700-D23P41



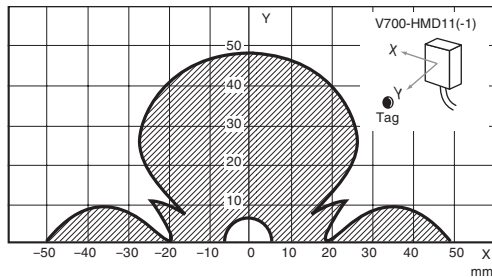
V700-H02 & V700-D13P31



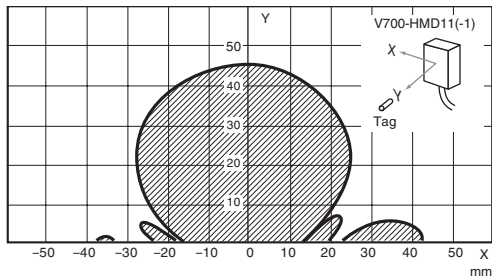
V700-H02 & V700-D23P41



V700-HMD11(-1) & V700-D13P31



V700-HMD11(-1) & V700-D23P41



■ Transmission Time

The transmission time is the time required for transmission between the Antenna and ID Tag and does not include time required for host communications.

Note: T = Transmission time (ms)
N = Number of pages (1 page = 8 bytes)

V700-CD□D-V□

Asynchronous	Write	$T = 46.7 N + 60.7$
	Read	$T = 52.8 N + 113.5$
Read-only synchronization	Read	$T = 46.7 N + 107.4$
Read-write synchronization	Write	$T = 52.8 N + 119.6$
	Read	$T = 52.8 N + 172.4$

V700-HMD11/HMD11-1

Read	$T = 48 N + 66$
Write	$T = 55 N + 120$

Precautions on Using the Product Near Noise Sources

This product makes transmissions to ID Tags using a frequency of 125 KHz. Transceivers, motors, monitoring devices, and power supplies have parts that generate electromagnetic waves (noise). These waves may interfere with transmissions to ID Tags. Before using this product near these kinds of devices, check that there is no adverse affect on transmissions.

Multiple Access with the V700-□D-V□

The transmission time when using multiple-access commands not only depends on the number of bytes, but also on the number of ID Tags in the transmission range and the combination of the ID Tags' codes. The average values for random ID codes are given below.

Functions

■ Transmission Functions

	V700-CD1D-V3 V700-CD2D-V3	V700-HMD11 V700-HMD11-1
Single access	Provided	Provided
FIFO	Provided	Provided
Multiple access	Provided	Not provided
Selective access	Provided	Not provided

Note: The V700-CD□D-V□ and V700-HMD11(-1) have different command structures.

	ID Tag	Transmission distance
Using the V700-H01/H02	V700-D13P31	0 to 250 mm
	V700-D23P41	0 to 220 mm
Using the V700-HMD11 or V700-HMD11-1	V700-D13P31	8 to 43 mm
	V700-D23P41	0 to 37 mm

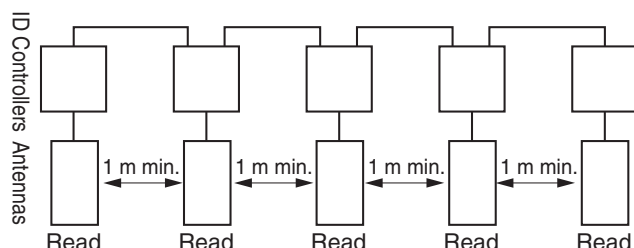
Note: The transmission distance is the same for reading and writing.

■ Mutual Interference Prevention Functions

If there is less than 15 m between Antennas, all the Antennas must be synchronized to prevent mutual interference. This can be done using either of the two methods described below.

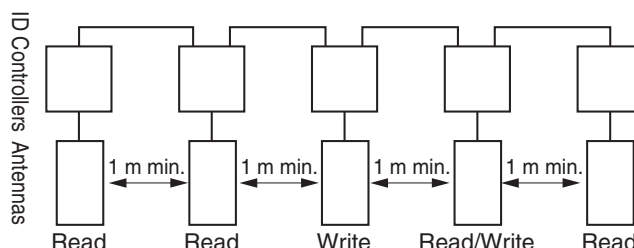
Read-Only Synchronization

If all the Antennas only use read commands, this method can be used to reduce the access time.



Read/Write Synchronization

This is the synchronization method that is usually used. It enables the synchronization of both read and write commands for several connected Antennas.



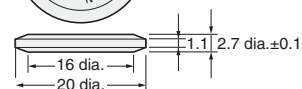
Dimensions

Note: All units are in millimeters unless otherwise indicated.

ID Tag

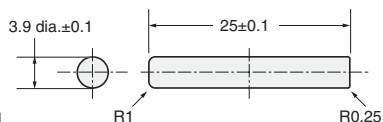
V700-D13P31

Coin-shaped ID Tag



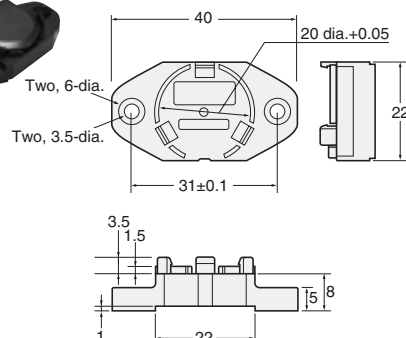
V700-D23P41

Stick-shaped ID Tag



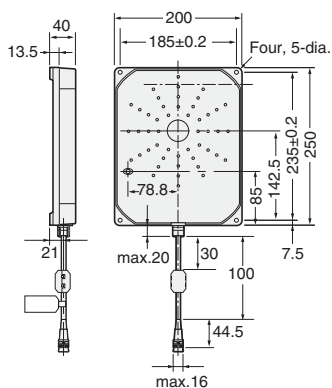
ID Tag Holder (for V700-D13P31)

V700-A80

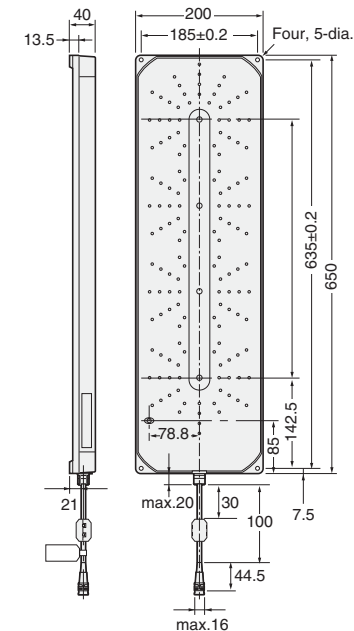


Antenna

V700-H01 Standard Antenna

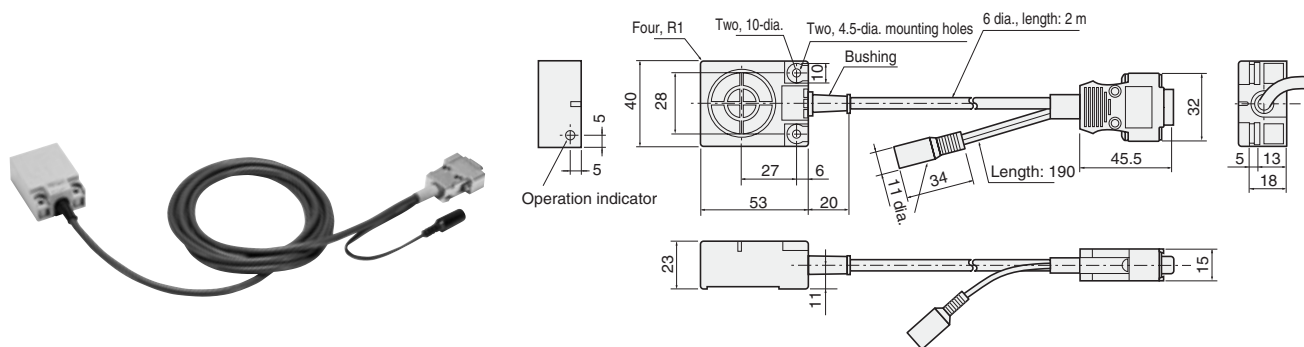


V700-H02 Wide-field Antenna

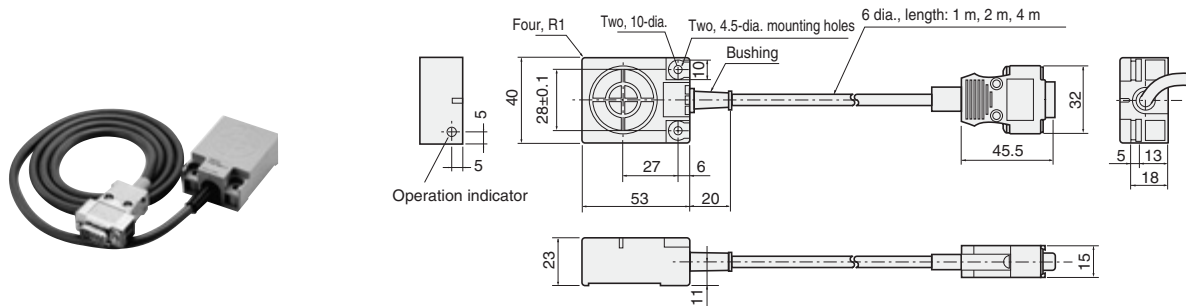


Compact Reader/Writer

V700-HMD11

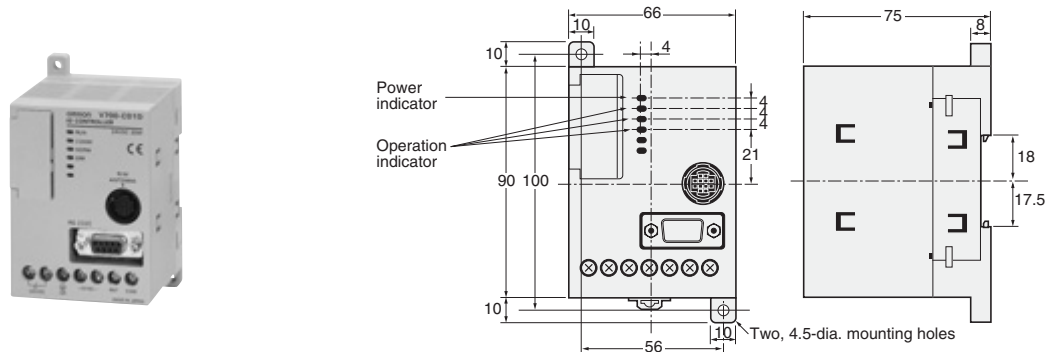


V700-HMD11-1

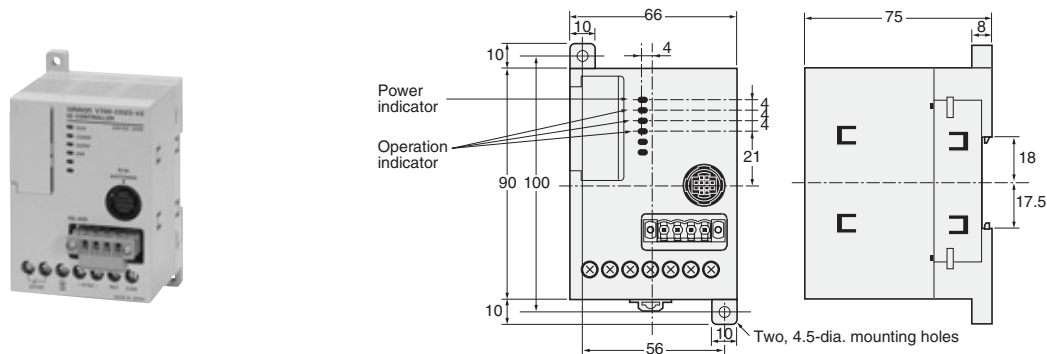


Controller

V700-CD1D-V3

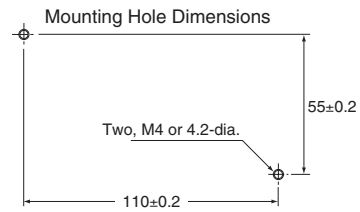
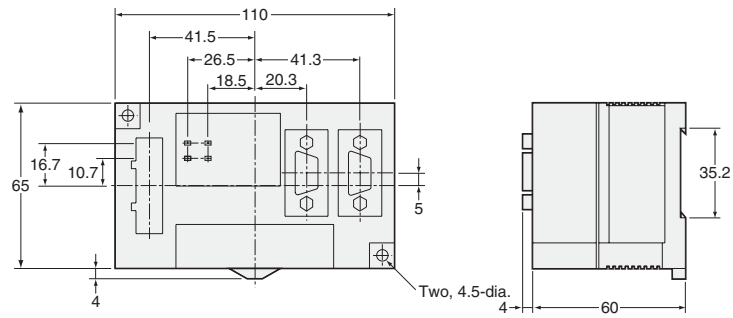


V700-CD2D-V3



ID Link Unit

V700-L12



■ CF Card-Type RFID Unit V705-HMF01

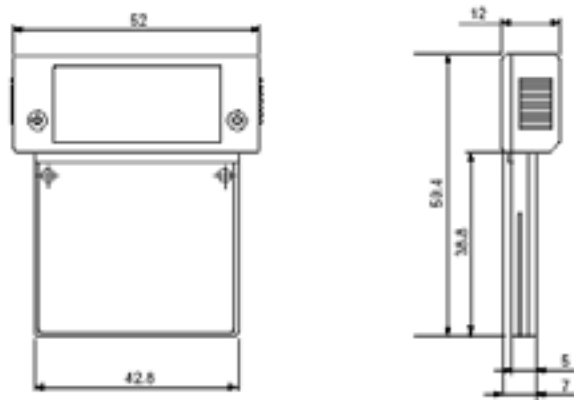
- Omron's V705-HMF01 CF Card-type RFID Unit connects to a variety of PDAs (Personal Digital Assistants) to form a handy RFID Reader/Writer system. Its compact size ensures easy portability for use virtually anywhere.
- Supports original Omron Tags (V700-D13P21/31, V700-D23P41).
- Readily available PDA interface: Compact Flash Type 2 (<http://www.compactflash.org/>).
- Highly versatile functions, such as Read/Write modes, in a compact size.
- Combining the V705-HMF01 with a PDA costs much less than most handy RFID readers.



V705-HMF01 Product Specifications

Item	Specifications
Communications frequency	125 kHz
Ambient temperature in operation	0 to 50°C (with no icing)
Weight	Approx. 25 g
Supply voltage	3.3 VDC \pm 5%
Antenna dimensions	50 (W) x 20 (H) x 13 (D) mm (the dimensions of the portion of the antenna extending from the PDA when the Unit is mounted in the PDA)
Current consumption	Approx. 90 mA (oscillating); approx. 70 mA (not oscillating)
Communications range	20 mm with V700-D13P31
Interface	Compact Flash Type 2 (9,600 bps)

Dimensions



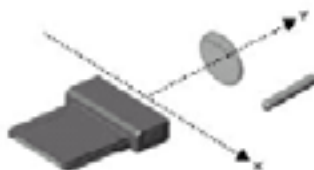
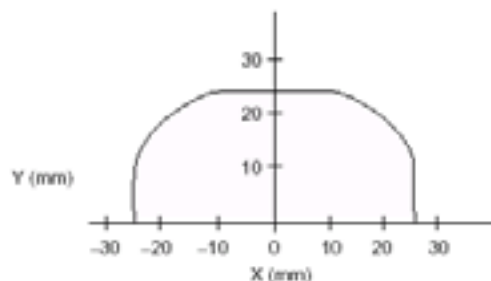
Communications Time Reference Value

Read	$T = 48 N + 66$
Write	$T = 55 N + 120$

Note: T = Transmission time (ms)
N = Number of pages (1 page = 8 bytes)

Communications Range

Tag V700-D13P31/21



■ PCB-Type Reader/Writer Modules V700-HMC7□



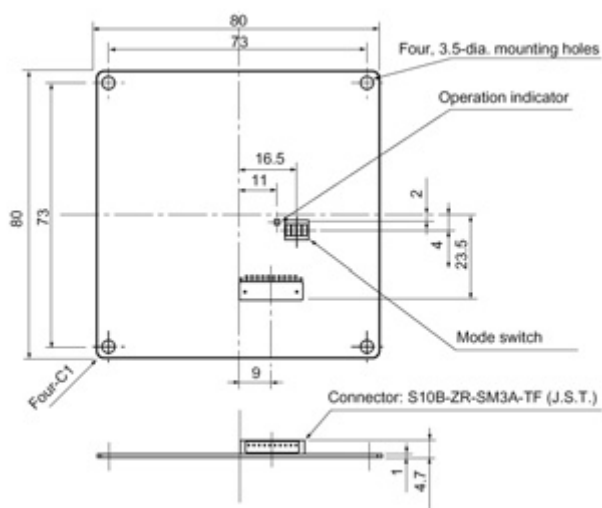
- These PCB-type Reader/Writer Modules are mounted to PCBs for incorporation into systems. A built-in C-MOS interface enables direct connection to the host CPU.
- The Modules offer industry-leading baud rate, as well as transmission distance and security specifications exceeding those of other products in the same class.

V700-HMC7□ Product Specifications

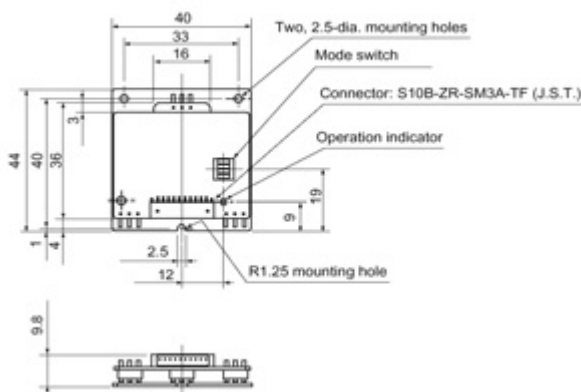
Item	V700-HMC71	V700-HMC73
Dimensions	80 x 80 x 5 mm	40 x 44 x 10 mm
Mounting	M3 screw mounting at 4 points	M2 or M2.3 screw mounting at 3 points
Supply voltage	5 VDC $\pm 10\%$	
Current consumption	180 mA max. (oscillating), 15 mA max. (not oscillating)	
Vibration resistance	Destruction: 10 to 150 Hz, 0.15-mm single amplitude at 20 m/s ² in three directions 4 times for 8 minutes	
Shock resistance	Destruction: 200 m/s ² three times each in six directions	
Ambient temperature in operation	-10 to 55°C	
Ambient temperature in storage	-25 to 65°C	
Ambient humidity in operation	25% to 85% (with no condensation)	
Communications frequency	125 kHz	
Weight	Approx. 18 g	Approx. 11 g

Dimensions

V700-HMC71

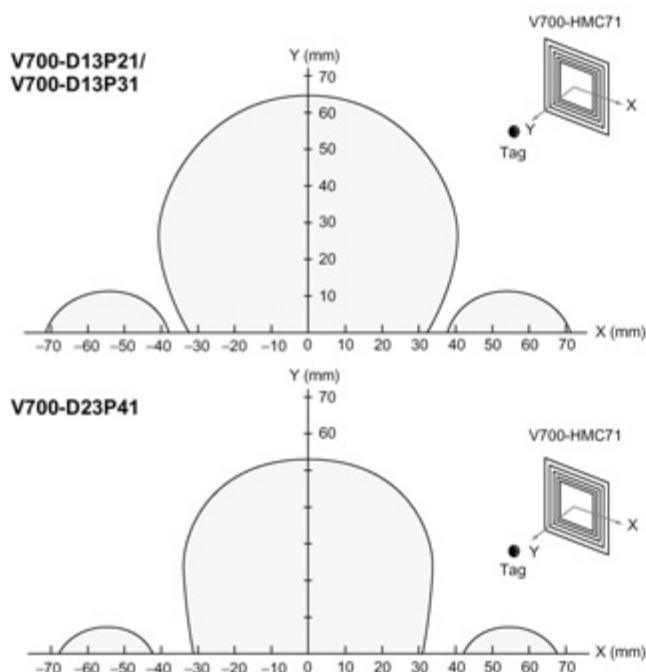


V700-HMC73

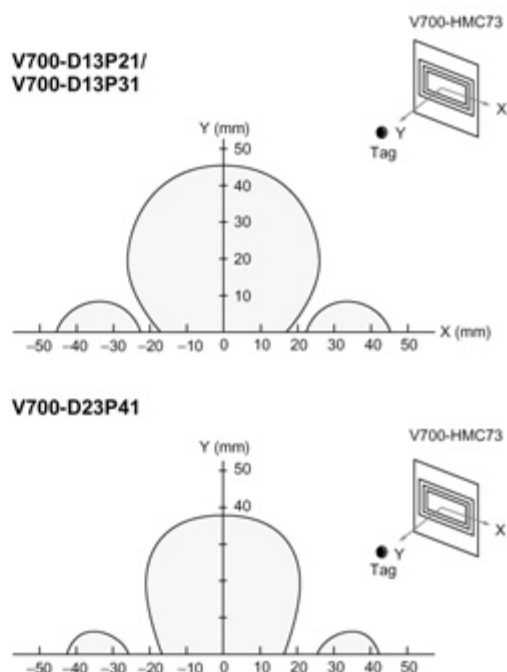


Antenna Operating Range

V700-HNMC71



V700-HNMC73



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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- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines and equipment that could present a risk to life or property.

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Electromagnetic Inductive RFID System for Semiconductor Industry V700 for Semiconductor Industry






RFID Systems Conforming to SEMI E15.1 and E99, and SECS I/II

- Antenna dimensions are based on antenna area specifications in SEMI E15.1, ensuring conformance with the standard's transmission range specification.
- Compatible with the SECS interface specified in SEMI E4, E5, and E99.
- Lineup includes ID Link Unit that enables several antennas connected via the load ports to be controlled through just one host channel.
- Uses special Tags that are cleaned in purified water.




Ordering Information

■ List of Models



Item	Specifications/Design		Model	
ID Tag	3.9 dia. × 25 mm	Special stick-shaped Tag for semiconductors 256 bytes (with user area of 240 bytes)		V700-D23P41-1
IDRW Head	44.8 × 149.8 × 73 mm	1-m cable RS-232C interface		V700-HMD13A
	40 × 53 × 23 mm	1-m cable RS-232C interface		V700-HMD11-1
		2-m cable RS-232C interface		V700-HMD11-1 2M
		4-m cable RS-232C interface		V700-HMD11-1 4M
ID Link Unit	110 × 65 × 64 mm	24 VDC RS-232C interface RS-485 interface		V700-L11
CIDRW Controller	150 × 167 × 28 mm	24 VDC RS-232C interface (Compatible with SECS I/II protocol.)		V700-L21

Specifications


■ ID Tags

Item	V700-D23P41-1 
Memory capacity	240 bytes (user area)
Memory type	EEPROM
Data backup time	10 years after data written
Data writing times	100,000 times per address
Ambient operating temperature (during transmission)	-25 to 70°C (with no icing)
Ambient operating temperature (not during transmission)	-40 to 110°C (with no icing)
Ambient storage temperature	-40 to 110°C (with no icing)
Ambient operating humidity	35% to 95% (with no condensation)
Degree of protection	IEC60529: IP67
Vibration resistance	10 to 2,000 Hz, 0.75-mm single amplitude, 150-m/s ² acceleration with 10 sweeps of 15 min each in X, Y, and Z directions
Shock resistance	500-m/s ² acceleration for 3 times each in X, Y, and Z directions (18 times in total)
Material	Case: PBT resin; Filling: Epoxy resin
Weight	Approx. 1 g
Cleaning	Cleaned with purified water. Capable of withstanding ultrasonic cleaning.


■ IDRW Head

Item	Model	
	V700-HMD13A 	V700-HMD11-1 
Host interface	RS232C (special 1-to-1 protocol)	
Power consumption	5 VDC ±5% (supplied via V700-L11 Link Unit) Oscillating: 400 mA max.	5 VDC ±5% (supplied via V700-L11 Link Unit) Oscillating: 250 mA max.
Insulation resistance	50 MΩ min. (at 500 VDC) between the cable terminals and the case	
Dielectric strength	1,000 VAC (50/60 Hz, 1 minute) between the cable terminals and the case (leakage current: 5 mA max.)	1,000 VAC (50/60 Hz, 1 minute) between the cable terminals and the case (leakage current: 1 mA max.)
Vibration resistance	10 to 150 Hz, 0.2-mm double amplitude, 10-m/s ² acceleration with 10 sweeps of 8 min each in X, Y, and Z directions	10 to 150 Hz, 1.50-mm double amplitude with 4 sweeps of 8 min each in X, Y, and Z directions
Shock resistance	150-m/s ² acceleration for 3 times each in X, Y, and Z directions (18 times in total)	300-m/s ² acceleration for 3 times each in X, Y, and Z directions (18 times in total)
Ambient operating temperature	0 to 40°C (with no icing)	-10 to 55°C (with no icing)
Ambient operating humidity	35% to 85% (with no condensation)	25% to 85% (with no condensation)
Ambient storage temperature	-15 to 50°C (with no icing)	-25 to 65°C (with no icing)
Ambient storage humidity	35% to 85% (with no condensation)	25% to 95% (with no condensation)
Degree of protection	IEC60529: IP30	IEC60529: IP67
Material	Case: Aluminum; Detecting surface: Bakelite; Cable: PVC (oil-resistant); Mounting bracket: SUS304	Case: ABS resin; Filling: Epoxy resin; Cable: PVC (oil-resistant)
Cable length	1 m (Extendable up to a total length of 4 m when using the V700-L11.)	1, 2, 4 m
Weight	Approx. 380 g	Approx. 185 g (1 m)

■ ID Link Unit

Item	V700-L11 
Host interface	RS-232C or RS-485 (Up to 31 Link Units can be connected.)
Number of connectable IDRW Heads	1
Power supply voltage	24 VDC +15%/–15%
Power consumption	10 W max.
Insulation resistance	50 MΩ min. (at 500 VDC) between the power supply terminals and the ground terminal
Dielectric strength	1,000 VAC (50/60 Hz, 1 minute) between the power supply terminals and the ground terminal (leakage current: 5 mA max.)
Vibration resistance	10 to 150 Hz, 0.20-mm double amplitude, 15-m/s ² acceleration with 10 sweeps of 8 min each in X, Y, and Z directions
Shock resistance	150-m/s ² acceleration for 3 times each in X, Y, and Z directions (18 times in total)
Ambient operating temperature	0 to 40°C (with no icing)
Ambient operating humidity	35% to 85% (with no condensation)
Ambient storage temperature	–15 to 50°C (with no icing)
Ambient storage humidity	35% to 85% (with no condensation)
Degree of protection	IEC60529: IP20
Ground	Ground at a resistance of less than 100 Ω. If grounding is not performed properly, transmission specifications may be adversely affected by the surrounding environment.
Weight	Approx. 185 g

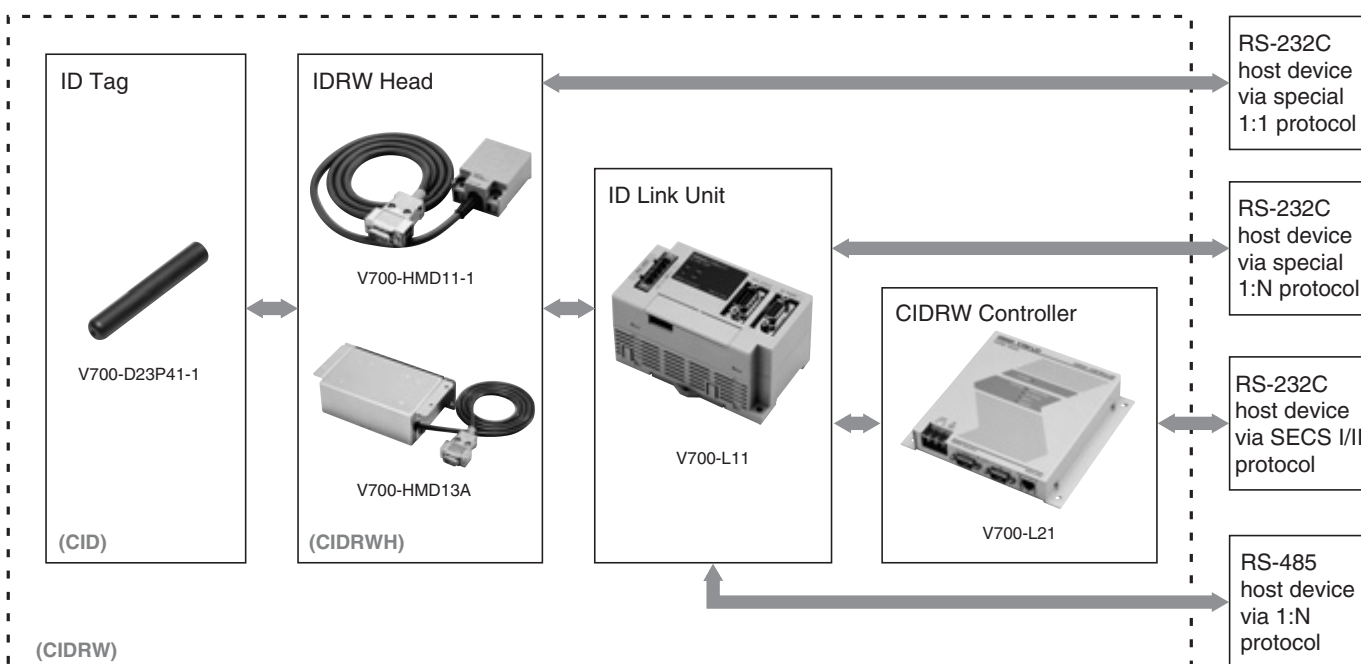
■ CIDRW Controller

Item	V700-L21 
Host interface	RS-232C
Power supply voltage	24 VDC, +10%/–15%
Power consumption	150 mW max.
Insulation resistance	50 MΩ min. (at 500 VDC) between the power supply terminals and the ground terminal
Dielectric strength	1,000 VAC (50/60 Hz, 1 minute) between the power supply terminals and the ground terminal (leakage current: 3.5 mA max.)
Vibration resistance	10 to 150 Hz, 0.20-mm double amplitude, 15-m/s ² acceleration with 10 sweeps of 8 min each in X, Y, and Z directions
Shock resistance	150-m/s ² acceleration for 3 times each in X, Y, and Z directions (18 times in total)
Ambient operating temperature	0 to 40°C (with no icing)
Ambient operating humidity	10% to 85% (with no condensation)
Ambient storage temperature	–15 to 65°C (with no icing)
Ambient storage humidity	10% to 95% (with no condensation)
Degree of protection	IEC60529: IP30
Ground	Ground at a resistance of less than 100 Ω.
Weight	Approx. 580 g

Interface Specifications

Classification Model Communications port Item	CIDRW Controller		ID Link Unit			IDRW Head
	V700-L21		V700-L11			V700-HMD11-1 V700-HMD13A
	SECS port	ID port	Host connection port	Multi- connection port	ID connection port	---
Connector	9-pin, D-sub, male, #4-40UNC		9-pin, D-sub, male, #4-40UNC	5-pin special con- nector (provided with Unit)	9-pin, D-sub, fe- male, M2.6	9-pin, D-sub, male, M2.6
Communications method	Conforms to RS-232			Conforms to RS- 485	Conforms to RS-232C	
Synchronization method	Start-stop synchronization method					
Communications control method	SEMI E4, E5 (SECS I/II)	Special OMRON 1-to-N protocol			Special OMRON 1-to-1 protocol	
Error detection method	SECS I (Check Sum)	FCS (Frame Check Sequence)			Even parity	
Baud rate (default value underlined)	1,200/2,400/ 4,800/ <u>9,600</u> / 19,200/38,400/ 57,600/115,200 bps	<u>9,600</u> /19,200/ 38,400 bps	4,800/ <u>9,600</u> /19,200/38,400 bps		<u>9,600</u> bps (fixed)	
Cable length	15 m max.			50 m max.	---	4 m max.

System Configuration



Note: 1. The terms in parentheses are the ones used in the SEMI standards.
2. The command structure depends on the system configuration.

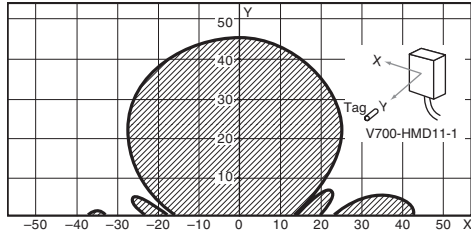
Characteristic Data (Typical)

■ Transmission Range

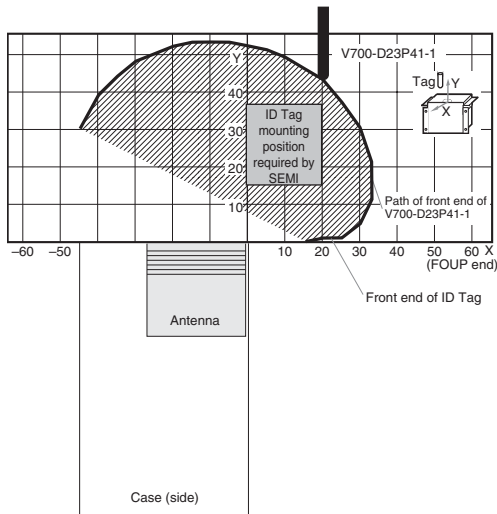
Note: All units are in millimeters unless otherwise indicated.

Antenna Operation Range Graphs

V700-HMD11-1 & V700-D23P41-1



V700-HMD13A & V700-D23P41-1



Connections

■ System Connection Example 1

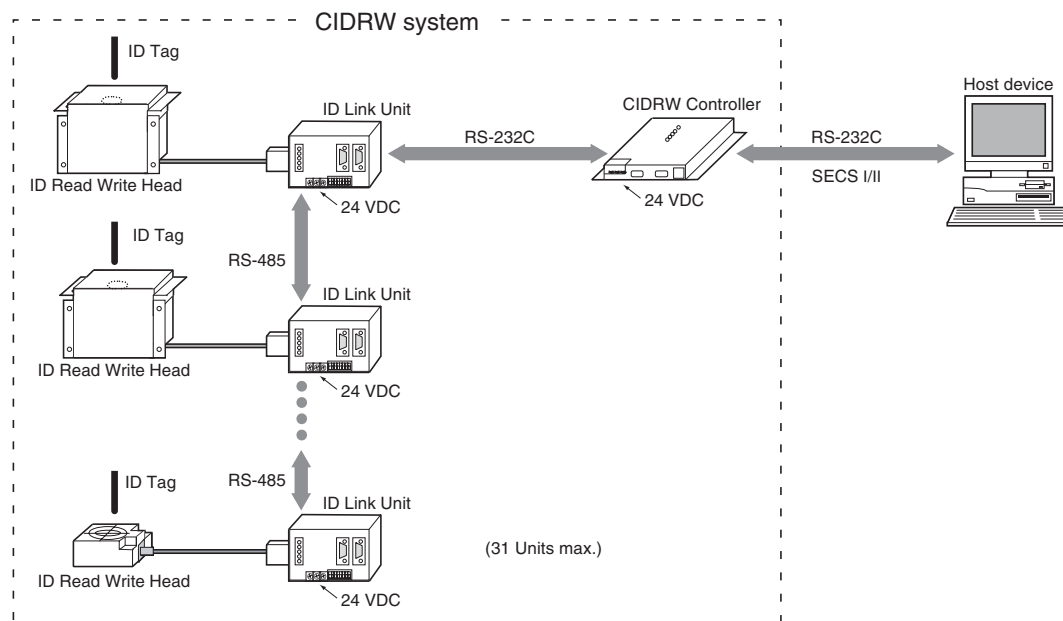
Systems with the CIDRW Controller (V700-L21)

The Carrier ID Reader/Writer (CIDRW) System is an RFID system that conforms to SEMI standards. The V700-L21 CIDRW Controller, the V700-L11 ID Link Unit, the V700-HMD13A or V700-HMD11-1 IDRW Head, and V700-D23P41-1 ID Tags can be used to create a Carrier ID Reader/Writer (CIDRW) System that conforms to the following standards:

- SEMI E99 THE CARRIER ID READER/WRITER FUNCTIONAL STANDARD
- SEMI E5 EQUIPMENT COMMUNICATION STANDARD 2 MESSAGE CONTENT (SECS II)
- SEMI E4 EQUIPMENT COMMUNICATION STANDARD 1 MESSAGE TRANSFER (SECS I)

Note: SEMI: Semiconductor Equipment and Materials International
SECS: SEMI Equipment Communications Standard

CIDRW System



For more details on the standards, refer to the standards issued by SEMI.

■ System Connection Example 2

Systems without the CIDRW Controller (V700-L21)

The IDRW Head and the ID Link Unit can be used in combination to handle a variety of installation configurations (i.e., connection configurations and power supply voltages).

Host Device Interface: RS/232C/RS-485

Installation configuration	Connection configuration of IDRW Head and ID Link Unit
1-to-1 connection (RS-232C) 5-VDC power supply	
1-to-1 connection (RS-232C/RS-485) 24-VDC power supply	
1-to-N connection (RS-232C/RS-485) 24-VDC power supply	

Note: Connection is also possible to host devices with RS-485 interfaces by changing the ID Link Unit connection.

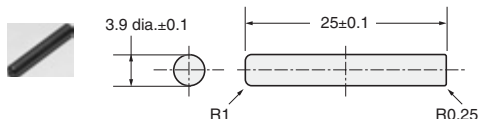
Dimensions

Note: All units are in millimeters unless otherwise indicated.

ID Tag

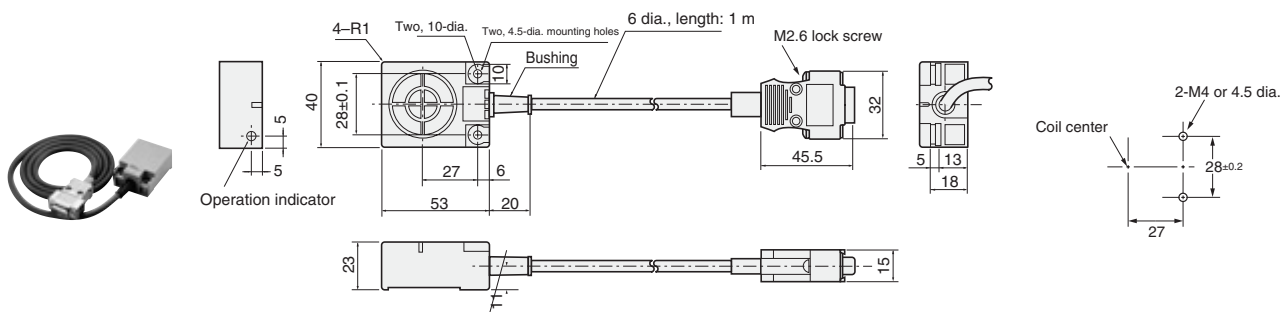
V700-D23P41-1

Stick-shaped ID Tag

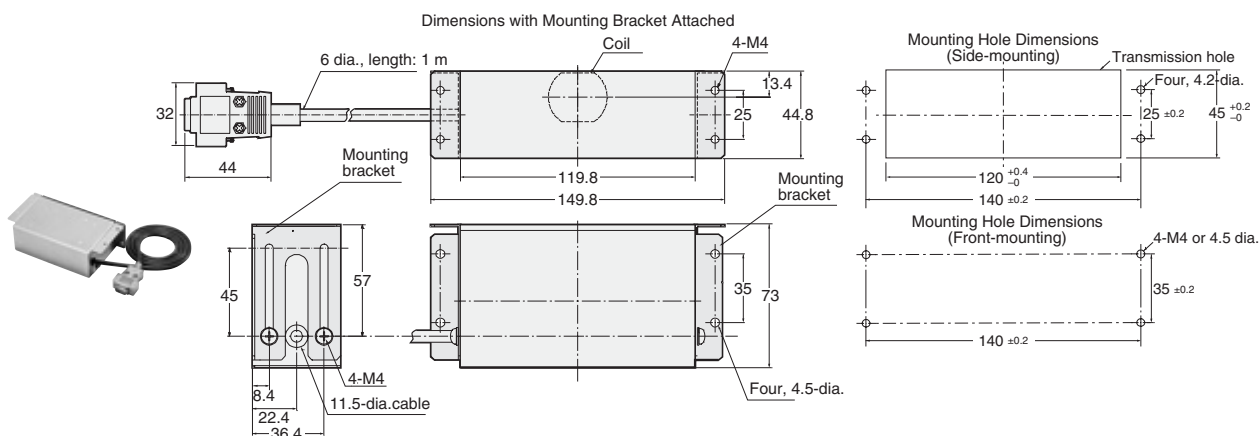


IDRW Head

V700-HMD11-1

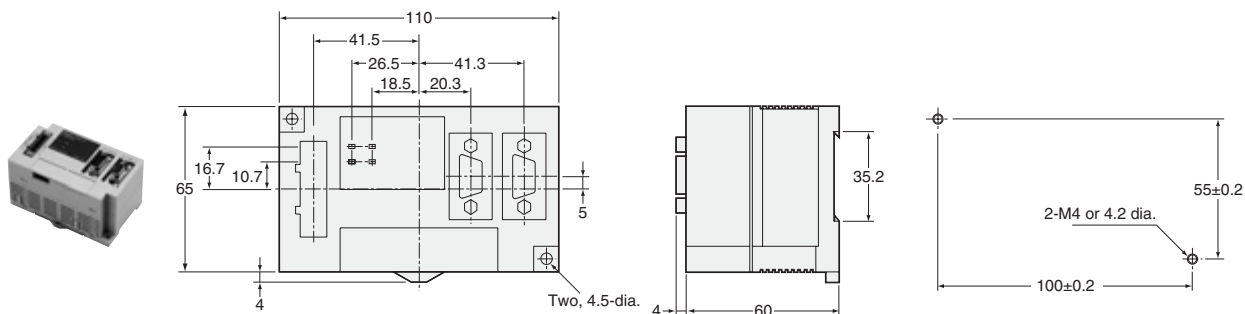


V700-HMD13A



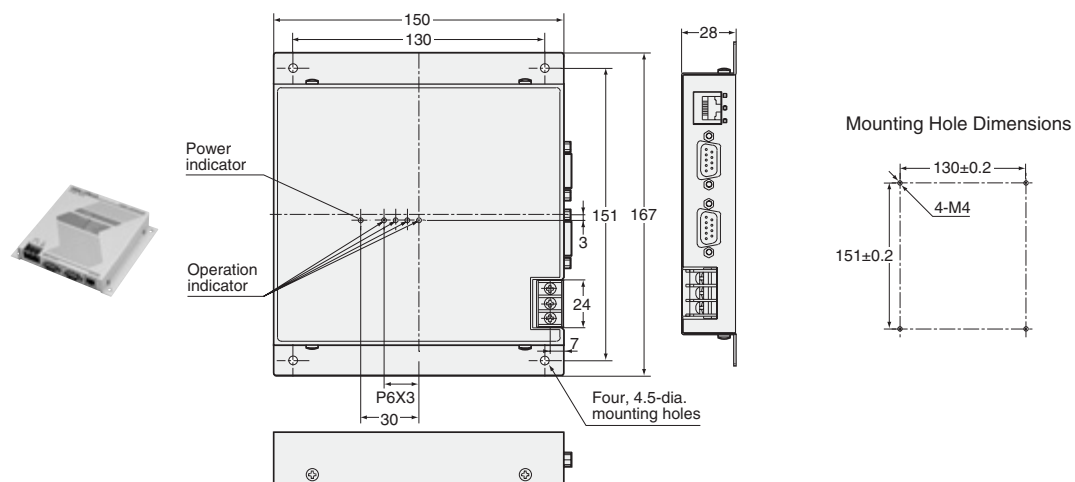
ID Link Unit

V700-L11



CIDRW Controller

V700-L21



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

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