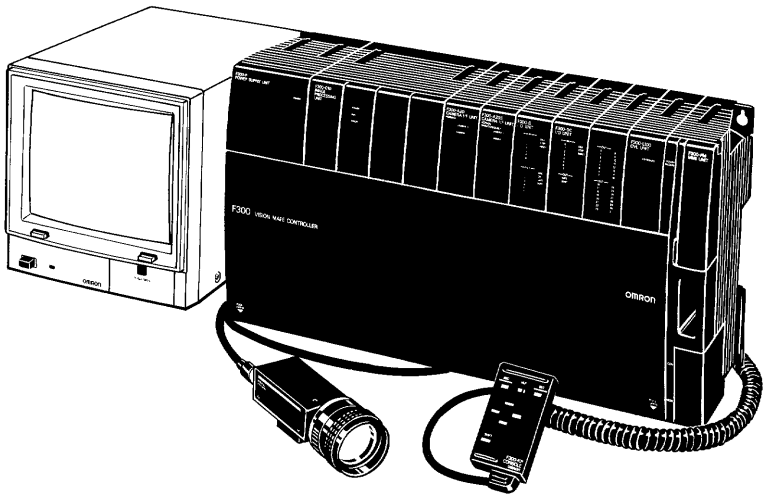
# F300 Visual Inspection System
## (F300-C12E)

## Specifications and Installation Manual

*Produced April 1997*



# Notice:

OMRON products are manufactured for use according to proper procedures by a qualified operator and only for the purposes described in this manual.

The following conventions are used to indicate and classify precautions in this manual. Always heed the information provided with them. Failure to heed precautions can result in injury to people or damage to property.

**⚠ DANGER** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

**⚠ WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

**⚠ CAUTION** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage.

## OMRON Product References

All OMRON products are capitalized in this manual. The word “Unit” is also capitalized when it refers to an OMRON product, regardless of whether or not it appears in the proper name of the product.

## Visual Aids

The following headings appear in the left column of the manual to help you locate different types of information.

**Important** Indicates information of importance that, if not heeded, could result in damage to the product, malfunction, or incorrect operation.

**Note** Indicates information of particular interest for efficient and convenient operation of the product.

***1, 2, 3...*** 1. Indicates lists of one sort or another, such as procedures, checklists, etc.

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# *About this Manual:*

This manual describes the basic installation and specifications of Units used in F300 Visual Inspection System and includes the sections described below.

Please read this manual completely and be sure you understand the information provided before attempting to install and operate an F300 Visual Inspection System.

***Section 1*** presents a brief introduction to the F300 Visual Inspection System, its required Units, and optional Units. This section also includes examples of system configurations.

***Section 2*** describes the basic components and operational specifications of each Unit in the F300 Visual Inspection System.

***Section 3*** describes operational, installation, and wiring requirements for the F300 Visual Inspection System.

***Section 4*** explains how to inspect and maintain the F300 Visual Inspection System and troubleshooting procedures to follow should problems occur.

**⚠WARNING** Failure to read and understand the information provided in this manual may result in personal injury or death, damage to the product, or product failure. Please read each section in its entirety and be sure you understand the information provided in the section and related sections before attempting any of the procedures or operations given.

# *General Safety Precautions*

The user must operate the product according to the performance specifications described in this manual and the operation manuals.

Make sure that the ratings and performance characteristics of the product are sufficient for the systems, machines, and equipment, and be sure to provide the systems, machines, and equipment with double safety mechanisms.

Heed the following cautions and warnings to prevent against injury or damage to the product.

**⚠ WARNING** **Terminal Block Cover of the Power Supply Unit**

To prevent electric shock after completing the connection of the Power Supply Unit, be sure to cover the terminal block with the terminal protection cover (the cover and screw are provided with the Unit) and fasten it using the plastic screw and the screw hole of the NC terminal.

**⚠ WARNING** **Earthing the Protective Conductor Terminal**

To prevent electric shock, be sure to wire the protective conductor terminal to the protective earth using a conductor at least 2-$mm^2$ (AWG14).

**⚠ WARNING** **Memory Card Batteries**

Do not short-circuits plus and minus battery terminals, attempt to charge batteries, take them apart, deform them, or dispose of them in a fire.
Batteries can explode, leak, or combust.

**⚠ WARNING** **Video Monitor**

Do not open the back cover of the Video Monitor.
High-voltage parts inside may cause electric shock hazard.

**⚠ CAUTION** **Hot Lights**

Do not touch a fluorescent, halogen, or strobe light while the power is on or immediately after power is turned off. These lights can become extremely hot. Install a shield or move the light to a location where it can’t be touched accidentally.

# *Important*

**1. External Power Source**

In the case of supplying the following terminals with an external power source, use a DC power supply with the safety extra-low voltage output.

- COM IN terminals of Terminal Block Units or Parallel I/O Units
- COM OUT terminals of Terminal Block Units or Parallel I/O Units
- COM terminals of Power Supply Units

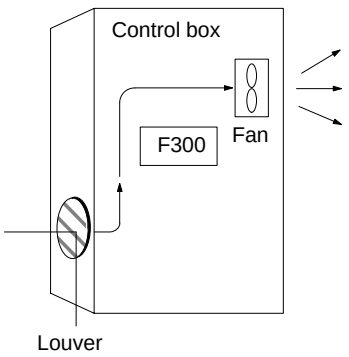
**2. Location**

Do not install an F300 System in locations subject the following conditions:

- Temperatures outside 0°C to 50°C
- Condensation due to rapid temperature fluctuations
- Relative humidity outside 35% to 85% RH
- Corrosive or flammable gas
- High concentrations of dust, salt, or iron particles
- Direct vibration or shock
- Direct sunlight
- Water, oil, or chemicals fumes or spray

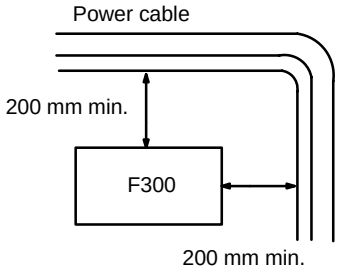
**3. Installation**

- Temperature Considerations:
  Consider environmental factors and ease of operation and maintenance when installing the F300 System in a control box.
  The operational temperature range of the F300 System is 0°C to 50°C. Take the following measures to maintain the F300 System in this range.
  - Maintain a minimum of 50-mm clearance above and below the F300 System to improve air flow.
  - Do not install the F300 System immediately above strong heat sources, such as heaters, transformers, or large-capacity resistors.
  - Provide a forced-air fan or air conditioning if the ambient temperature exceeds 50°C.




- Operation and Maintenance Considerations:
  Keep the F300 System away from high-voltage equipment and motors to improve safety during operation and maintenance.

- Noise Considerations:
  Do not install the F300 System in a cabinet containing high-voltage equipment or within 200 mm of power lines. Fully ground the mounting plate.




**4. Power Wiring**

- In order to avoid voltage drops, use power cables of at least 2 $mm^2$ (AWG14).
- To avoid interference from inductive noise, use twisted-pair cable.
- Wire the F300 power supply separately from other devices. In particular, wire it separately from any inductive loads.

**5. Protective Conductor (Earth) Wiring**

To avoid damage to the equipment due to lighting surge, short-circuit the GR and LG terminals using the short-circuiting bar (accessory).

To avoid damage to the equipment, do not share the protective ground wiring with any other devices nor wire the protective conductor terminal to the metal frame. Be sure to wire the protective conductor wiring of the equipment independently.

**6. Mounting Units**

Be sure to turn off the power supply before mounting Units. Replacing or adding a Unit while the power is turned on will result in damage to the Unit.

**7. Connecting Cameras**

- Don’t ground the camera case.
- Don’t remove the insulating attachment of the Camera.
- Don’t remove the ferrite core that is attached to the Camera Cable.

**8. Securing a Monitor**

- Don’t ground the monitor case.
- Make sure that there is no electrical conduction between the BNC terminals and the metallic mounting face.
- Use plastic screws if the Unit is to be mounted on a metal surface.

**9. Touching Uninsulated Parts**

In order to protect the Units from electrostatic discharge, operators must discharge static electricity from themselves before touching the uninsulated parts of the signal lines in the terminal block and the connector. For example, a grounded wrist strap can be used for the discharging.

# SECTION 1
# System Overview and Configuration

This section presents a brief introduction to the F300 System, its required Units, and optional Units. It also includes examples of system configurations.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# 1-1 System Components

After receiving the F300 System, make sure that following Units are delivered as ordered.

## 1-1-1 Required Units

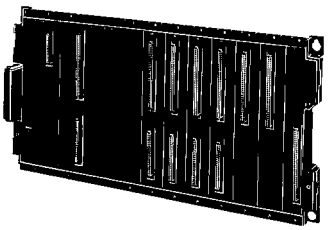
The following Units are essential in the configuration of the F300 System. You will need at least one of each type of Unit to construct an F300 System.

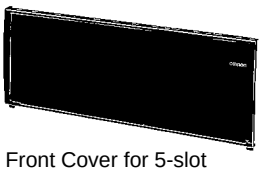
### F300-B□ Base Unit

A Base Unit supplies power to other Units mounted on it, such as Camera I/F Units and I/O Units. Base Units are available with either 3 slots or 5 slots. Either can be used depending on System size.

A Base Unit with various Units mounted to it to form a functional entity is called a Rack.

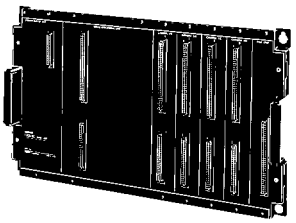
**5-slot Base Unit (F300-B52)**

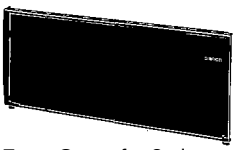




Front Cover for 5-slot Base Unit

**3-slot Base Unit (F300-B32)**





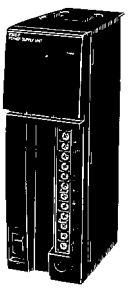
Front Cover for 3-slot Base Unit

### F300-P□□ Power Supply Unit

The Power Supply Unit converts 100 to 120 / 200 to 240 VAC power to DC power for the Units mounted to the Base Unit.

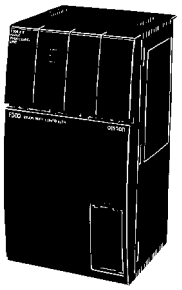
The voltages set before shipping are as follows:

- F300-P2: 100 to 120 VAC
- F300-P2E: 200 to 240 VAC



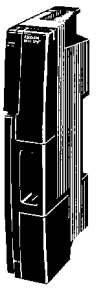
## F300-C12E/C11E IMP Unit

The IMP (Image Processing) Unit processes measurements.



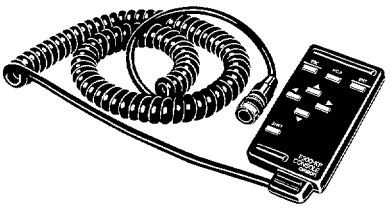
## F300-FM2 MMI Unit

The MMI (Man-Machine Interface) Unit is used to connect the Console, the Video Monitor, and memory cards.



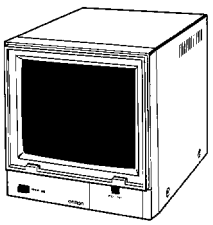
## F300-KP Console

The Console is connected to the MMI Unit and is used to execute commands and input settings.



## F300-M09 Video Monitor (100 VAC)

The Video Monitor is required to set F300 data and programs, check images, and display measurement results.

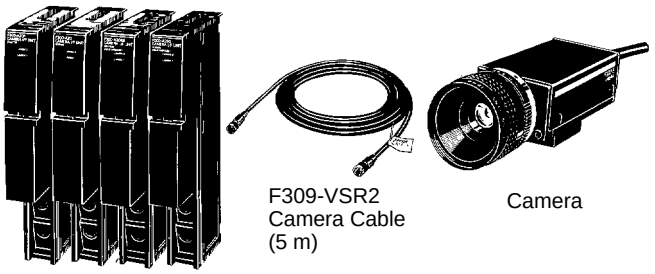


F309-VM Monitor Cable (2 m)

**Note** The F309-VM Monitor Cable incorporates a BNC connector, via which NTSC-standard video signals will be output to the Video Monitor.

### F300-A2□□□ Camera I/F Units

A Camera I/F Unit inputs video signals from a camera to the F300. Five types of Camera I/F Unit are available to suit different applications. Two cameras can be connected to each Camera I/F Unit. Order the lens separately.



F309-VSR2 Camera Cable (5 m)

Camera

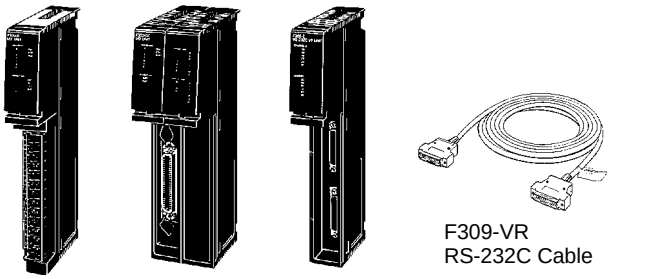
| Unit | Input | Model | Camera | Camera Cable |
|---|---|---|---|---|
| Camera I/F Unit | Normal | F300-A20 | F300-S Camera<br>F200-S Camera | F309-VSR2 (5 m) |
| | Normal, simultaneously | F300-A22S | F300-S Camera | |
| | Shutter | F300-A20R | F300-S2R Shutter Camera<br>F300-S3DR Shutter Camera | |
| | Shutter, simultaneously | F300-A22RS | | |
| | Frame shutter | F300-A23RS | F300-S4R Frame Shutter Camera | |

## 1-1-2 Optional Expansion Units

Expansion Units are optional and are available to further extend the capabilities of the F300 System.

### I/O Units

I/O Units can be used to input measurement commands from external devices and to output results. Select the Unit to suit the application from the Terminal Block Unit, Parallel I/O Unit, or RS-232C I/F Unit.



F300-D2 Terminal Block Unit

F300-DC2 Parallel I/O Unit

F300-E2 RS-232C I/F Unit

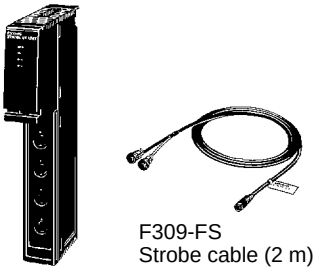
F309-VR RS-232C Cable (25-pin connector, 5 m)

**Note** Both the Terminal Block Unit and Parallel I/O Unit are identified as I/O Unit (F300-D2) and I/O Unit (F300-DC2) on the actual units.

| Unit | No. of I/O | Cable | Application |
|---|---|---|---|
| F300-D2<br>Terminal Block Unit | Inputs: 8<br>Outputs: 8 | None | Connect to a programmable controller or other device to input measurement commands and output measurement results. |
| F300-DC2<br>Parallel I/O Unit | Inputs: 8<br>Outputs: 32 | 50P L connector (included with Unit) | |
| F300-E2<br>RS-232C I/F Unit | RS-232C interface: 2 channels | F309-VR (25-pin connector, 5 m). If the connector is different. Refer to 2-2-5 F300-E2 RS-232C I/F Unit for cable connections in detail. | Connect to a computer or other device equipped with an RS-232C interface to input measurement commands and output measurement results. |

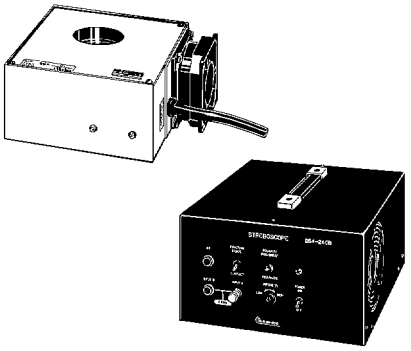
## F300-FS Strobe I/F Unit

The Strobe Unit flashes the external strobe in synchronization with the image-input signal. Up to four Strobes can be connected to each Strobe Unit.



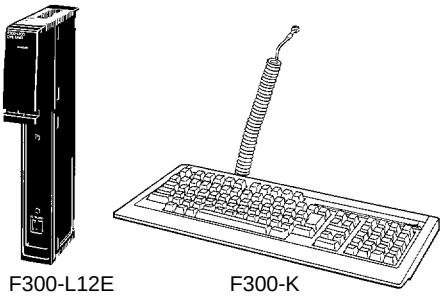
F309-FS
Strobe cable (2 m)

The following Strobes can be connected to the Strobe Unit.



## F300-L12E OVL Unit

The F300 can be operated using the OMRON Visual Language (OVL). Commands and data are input from a special keyboard connected to an OVL Unit.

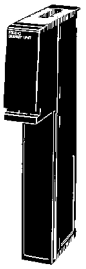


F300-L12E
OVL Unit

F300-K
Keyboard

## F300-G Dummy Unit

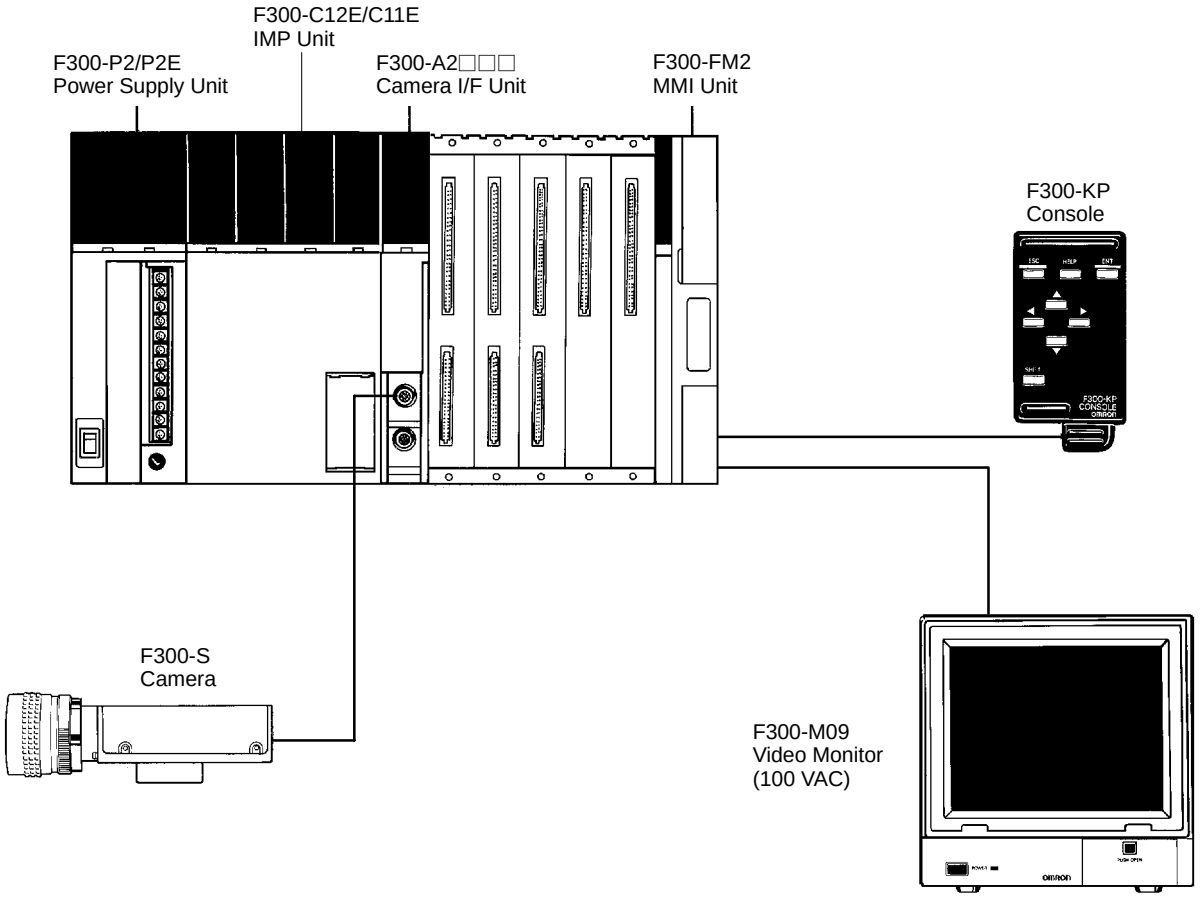
A Dummy Unit can be inserted into empty slots to improve external appearance, protect connectors, and maintain the strength of the Rack.



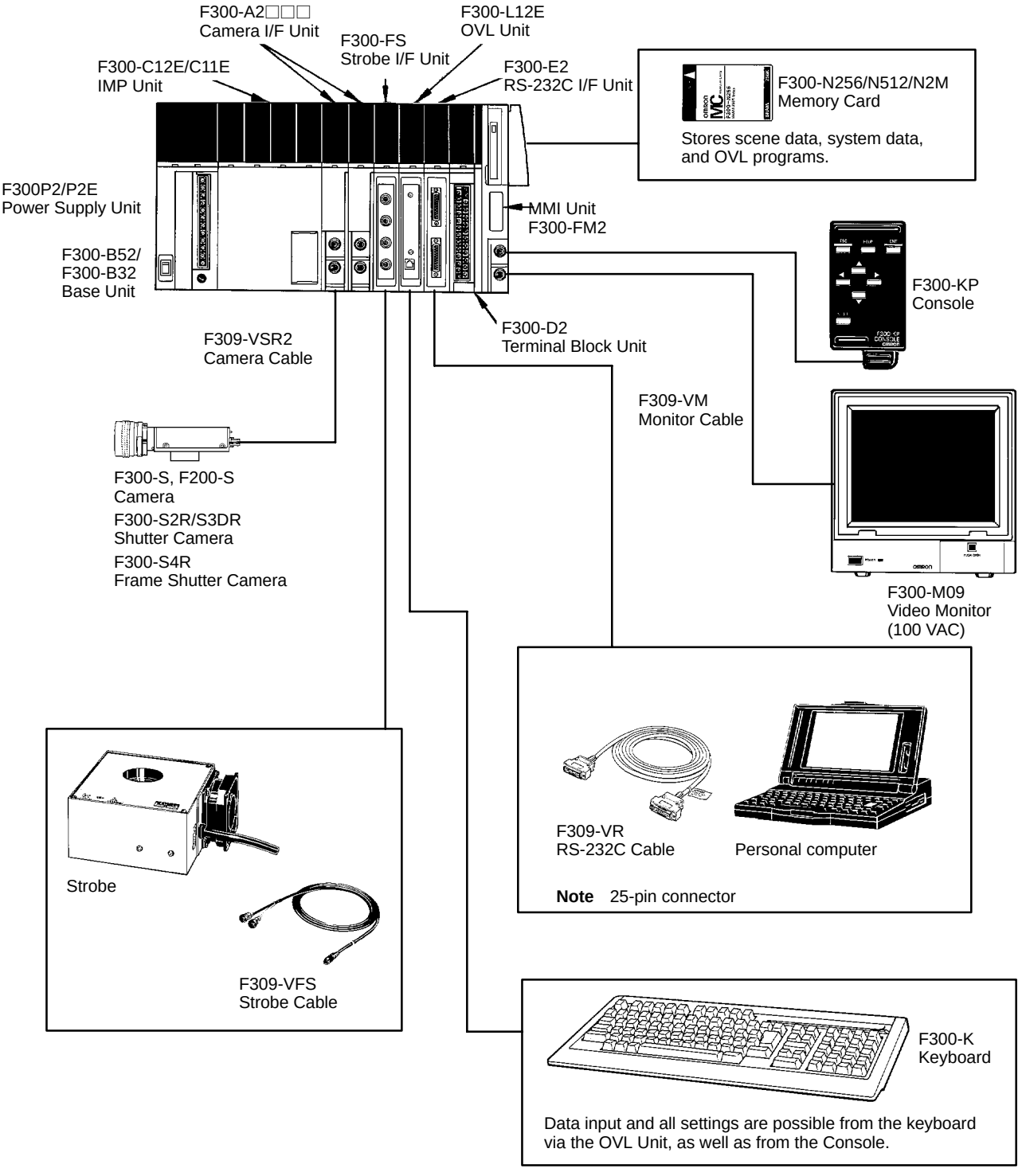
# 1-2 System Configuration

## 1-2-1 Basic System

A basic F300 System is shown below.



## 1-2-2 Expanded System



# SECTION 2
# Specifications and Features

This section describes the basic components and operational specifications of each Unit in a F300 System.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# 2-1 Required Units

One or more of each of the following types of Unit is required in any F300 System.

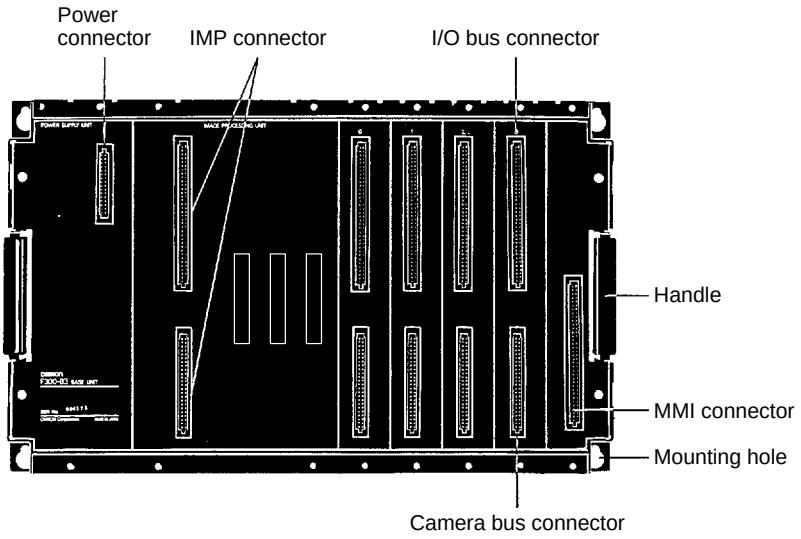
## 2-1-1 F300-B52/-B32 Base Unit

The F300-B32 and F300-B52 Base Unit provide hardware slots sharing a common bus line on which all Units are mounted and connected.

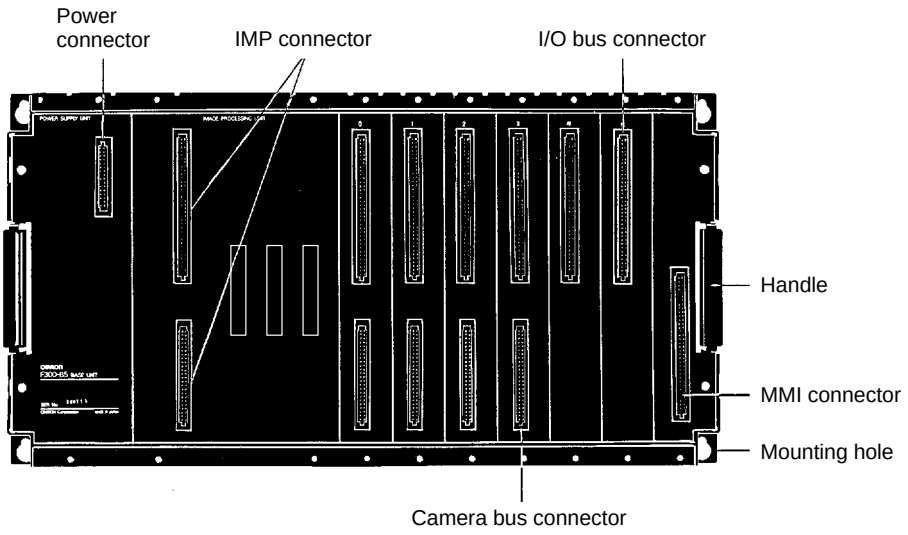
### Components

The following illustrations show the essential components of the F300-B32 and F300-B52 Base Unit.

**3-slot Base Unit (F300-B32)**



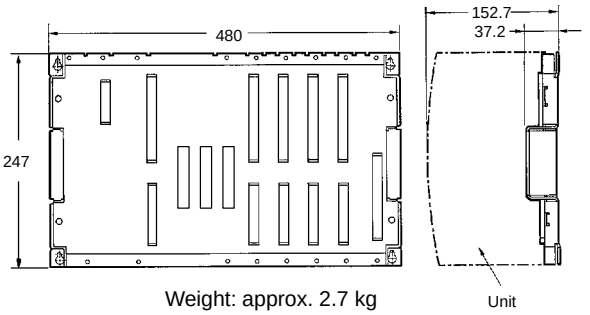

**5-slot Base Unit (F300-B52)**



## Dimensions and Weight

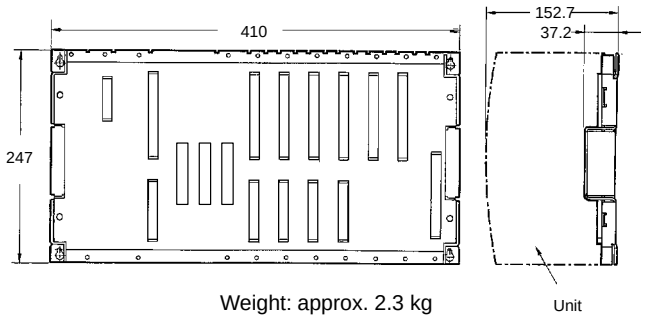
The following diagrams provide the weight, external dimensions, and mounting hole dimensions for the F300-B32 and -B52 Base Unit. Unless otherwise noted, all values are in millimeters (mm).

### F300-B32 3-slot Base Unit




Weight: approx. 2.7 kg

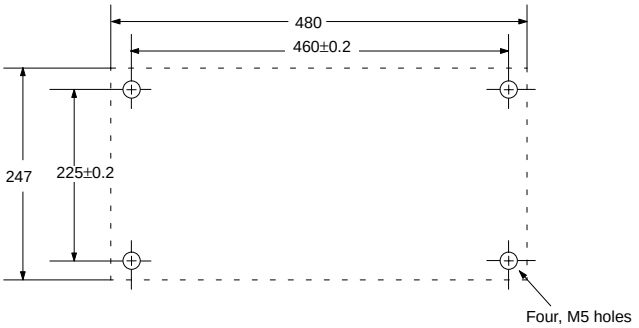
### F300-B52 5-slot Base Unit



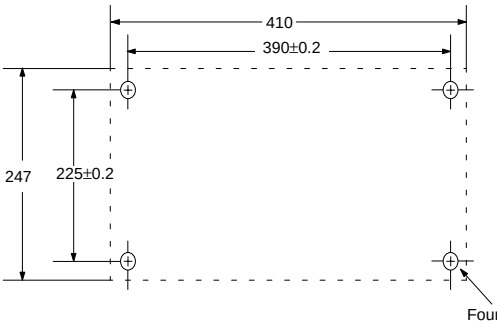

Weight: approx. 2.3 kg

## Mounting Hole Dimensions

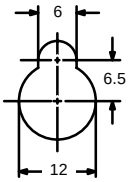
### 5-slot Base Unit (F300-B52)




### 3-slot Base Unit (F300-B32)



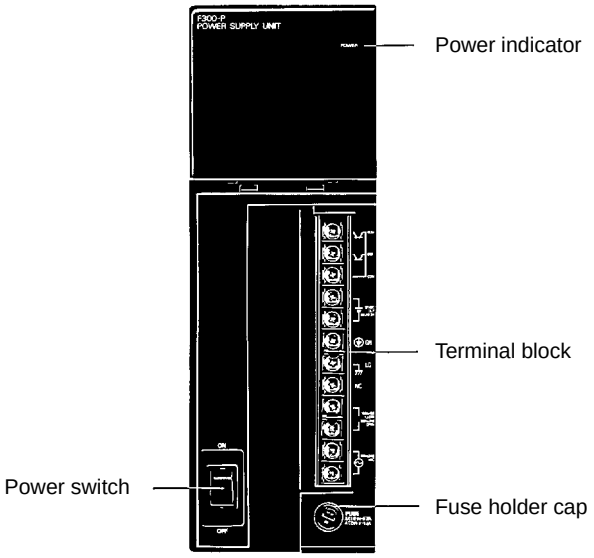
**Base Unit Mounting Hole Shape**




## 2-1-2 F300-P2/P2E Power Supply Unit

The Power Supply Unit takes in AC power supplied to the F300 and converts it to DC power for each unit. The following illustration shows the essential components of the F300-P2/P2E Power Supply Unit.

### Components

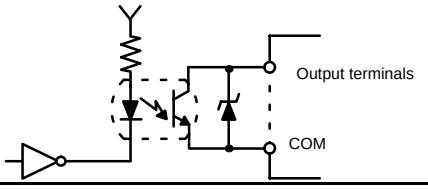



### Specifications

**General Specifications (All F300 Units)**

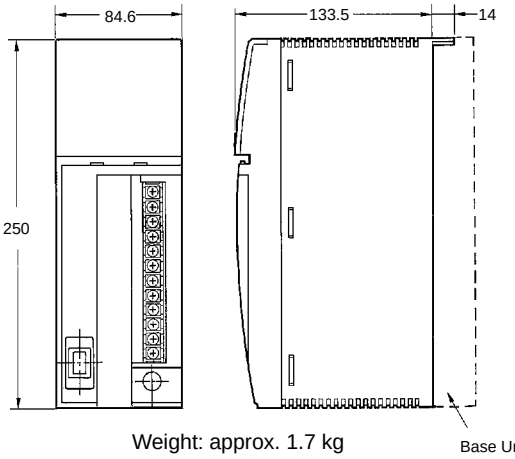
| Item | F300-P2 | F300-P2E |
|---|---|---|
| Supply voltage | 100 to 120 VAC | 200 to 240 VAC |
| Supply frequency | 50/60 Hz | |
| Insulation | 20 MΩ min. between all AC external terminals and GR terminal (at 500 VDC) | |
| Dielectric strength | 1,500 VAC, 50/60 Hz for 1 minute between all AC external terminals and GR terminal; detected current: 10 mA max. | |
| Noise resistance | 1500 Vp-p; pulse width: 1 μs; rising time: 1 ns (pulse) | |
| Vibration resistance | 10 to 150 Hz with 0.15-mm single amplitude | |
| Shock resistance | 20G (196 $m/s^2$) | |
| Ambient temperature | 0°C to 50°C | |
| Ambient humidity | 35% to 85% RH (no condensation) | |
| Ambient environment | No corrosive gases | |
| Storage temperature | –25°C to 65°C | |
| Protection class | Class I (with protective conductor terminal) | |
| Degree of protection | IP20 (in-panel) | |
| Environmental conditions according to IEC1010-1 | Indoor use<br>Maximum altitude of 2,000 m<br>Supply voltage fluctuations of ±10% of the rated voltage<br>Installation category II<br>Pollution degree 2 | |

**Performance Specifications**

| | | |
|---|---|---|
| **Power supply** | **Supplied to Units** | 5 VDC ±3%, 7 A<br>13 VDC ±1%, 4.5 A<br>–12 VDC ±5%, 0.9 A |
| | **Service supply** | 12 VDC ±5%, 0.3 A |
| **AC power interruption detection time** | | 10 ms min. |
| **Outputs (RUN, ERROR)** | **Output type** | Photocoupler |
| | **Output voltage** | 12 to 24 VDC ±10% |
| | **Load current** | 100 mA max. |
| | **Residual voltage** | 2 V max. |
| | **Leak current** | 0.1 mA max. |
| **Internal output circuits** | |  |

## Dimensions and Weight

The following diagram provides the external dimensions and weight of the F300-P2/P2E Power Supply Unit. Unless otherwise noted, values are in millimeters (mm).

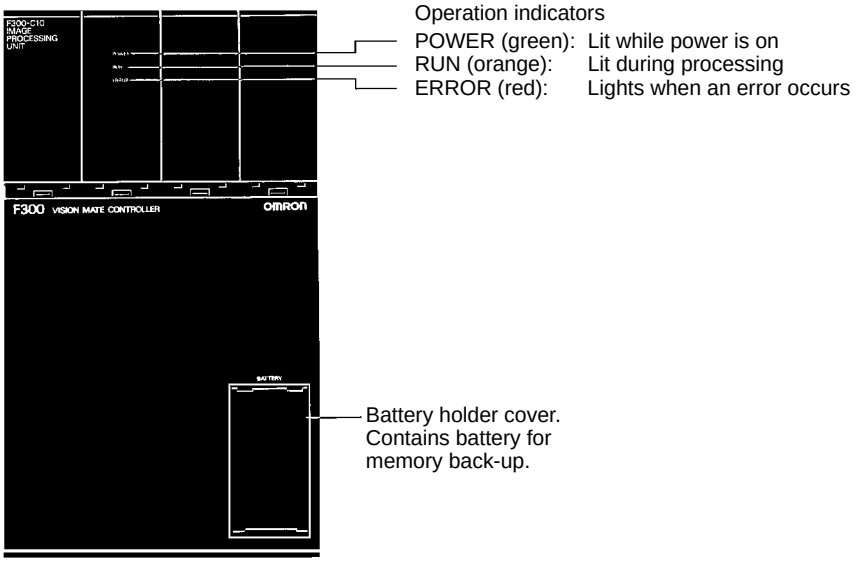



Weight: approx. 1.7 kg

## 2-1-3 F300-C12E/C11E IMP Unit

The IMP (Image Processing) Unit is required by the F300 to process measurements. The following illustration shows the essential components of the IMP Unit.

### Components



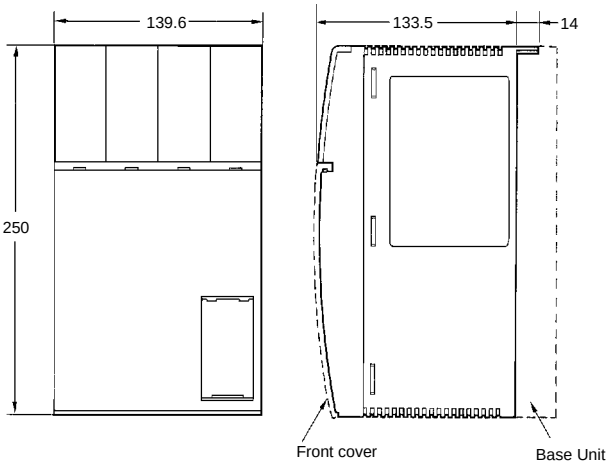

### Specifications

**General Specifications**

| | |
|---|---|
| **Ambient temperature** | 0°C to 50°C |
| **Ambient humidity** | 35% to 85% RH (no condensation) |
| **Ambient environment** | No corrosive gases |
| **Storage temperature** | –25°C to 65°C |
| **Degree of protection** | IP20 (in-panel) |

### Dimensions and Weight

The following diagram provides the external dimensions and weight of the IMP Unit. Unless otherwise noted, values are in millimeters (mm).

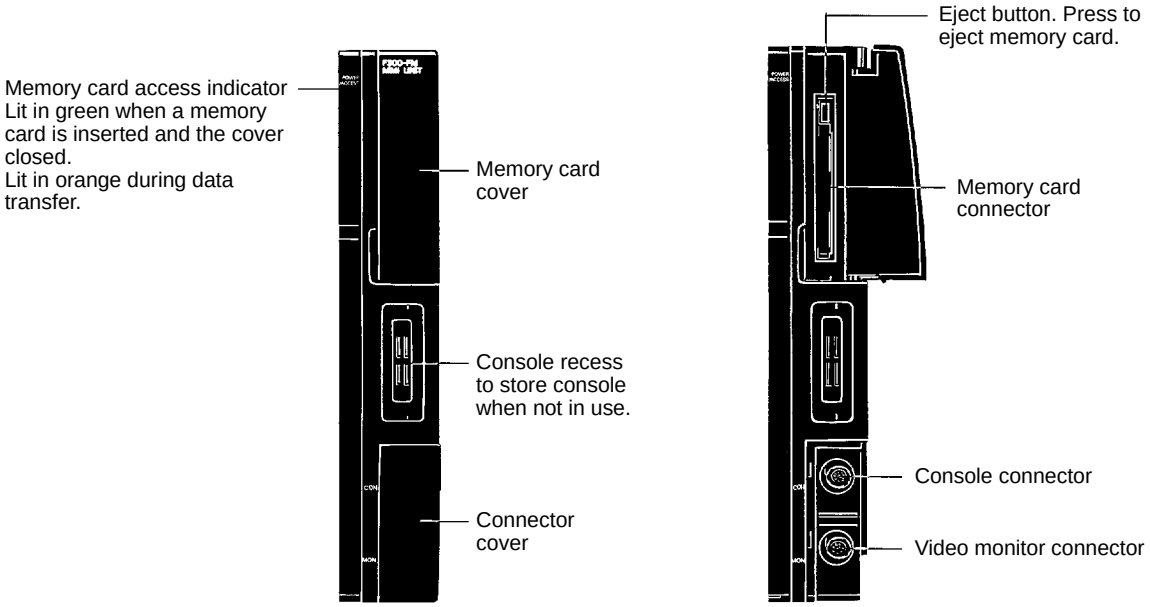



Weight: approx. 1.5 kg

## 2-1-4 F300-FM2 MMI Unit

The F300-FM2 MMI (Man-Machine Interface) Unit supports key inputs from the Console and image displays on the Video Monitor. The following illustrations shows the essential components of the F300-FM2 MMI Unit.

### Components



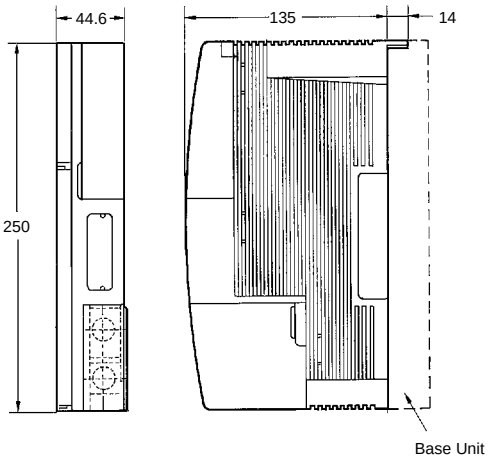

### Specifications

**General Specifications**

| | |
|---|---|
| **Ambient temperature** | 0°C to 50°C |
| **Ambient humidity** | 35% to 85% RH (no condensation) |
| **Ambient environment** | No corrosive gases |
| **Storage temperature** | –25°C to 65°C |
| **Degree of protection** | IP20 (in-panel) |

### Dimensions and Weight

The following diagram provides the external dimensions and weight of the F300-FM2 MMI Unit. Unless otherwise noted, values are in millimeters (mm).

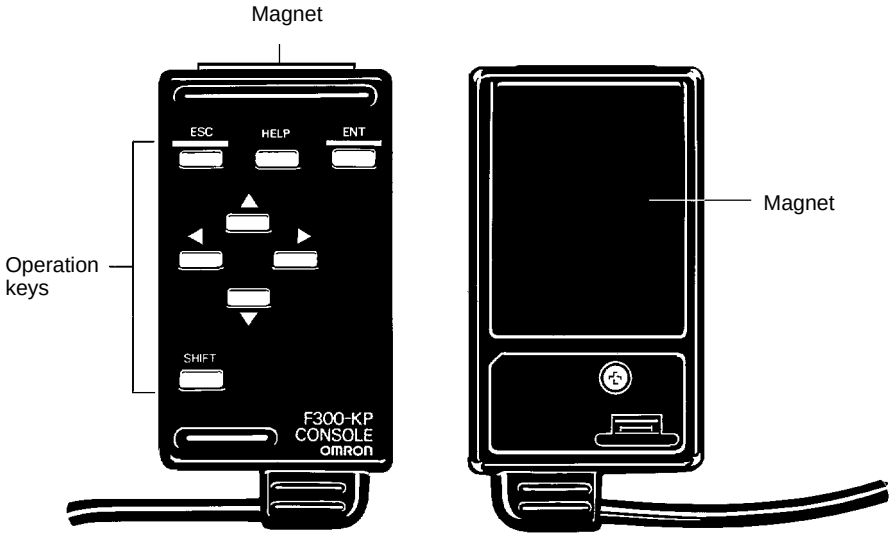



Weight: approx. 660 g

## 2-1-5 F300-KP Console

The F300-KP Console is the main F300 input device for menu operations and data input. Connect the Console to the MMI Unit. For information on Console operation, refer to the *F300 Visual Inspection System Menu Mode Operation Manual*. The following illustration shows the essential components of the F300-KP Console Unit.

### Components



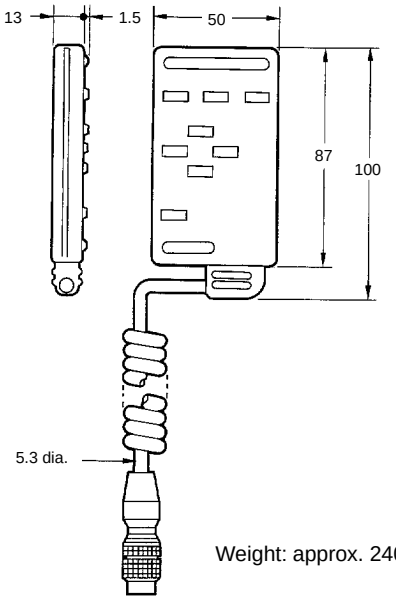

### Specifications

**General Specifications**

| | |
|---|---|
| **Ambient temperature** | 0°C to 50°C |
| **Ambient humidity** | 35% to 85% RH (no condensation) |
| **Ambient environment** | No corrosive gases |
| **Storage temperature** | –25°C to 65°C |
| **Degree of protection** | IP20 (in-panel) |

### Dimensions and Weight

The following diagram provides the external dimensions and weight of the F300-FM2 MMI Unit. Unless otherwise noted, values are in millimeters (mm).



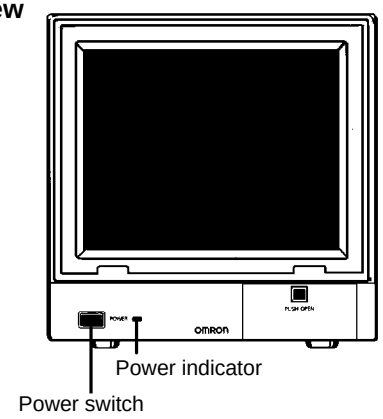

Weight: approx. 240 g (unit only)

## 2-1-6 F300-M09 Video Monitor

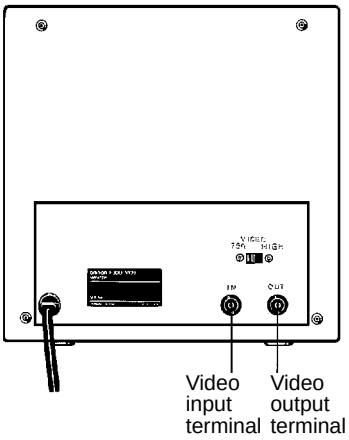
The F300-M09 Video Monitor is an output device of the F300 and used to display input images from the camera, data values that have been set, and measurement results.

### Components

**Front View**




**Rear View**




### Specifications

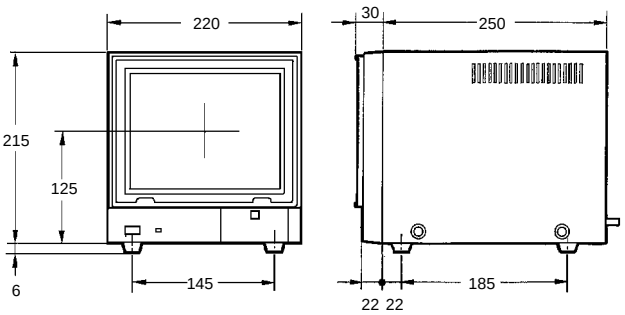
**General Specifications**

| | |
|---|---|
| **Ambient temperature** | 0°C to 40°C |
| **Ambient humidity** | 10% to 90% RH (no condensation) |
| **Ambient environment** | No corrosive gases |
| **Storage temperature** | –25°C to 65°C |

**Detailed Specifications**

| | | |
|---|---|---|
| **Rating** | **System** | Number of scanning lines: 525<br>Horizontal frequency: 15.75 kHz<br>Field frequency: 60 Hz |
| | **I/O impedance** | 75Ω, high impedance (selectable) |
| | **I/O level and polarity** | Image: 0.7 V (peak to peak), positive<br>Cycle: 0.3 V (peak to peak), negative |
| | **Screen size** | 164 x 123 mm (W x H) |
| **Performance** | **Resolution** | 700 TV min. (at center) |

### Dimensions and Weight




Weight: approx. 5.8 kg

**⚠ WARNING** Do not open the back cover of the video monitor. High voltage part inside may cause electric shock hazard.

## 2-1-7 F300-A2□□□ Camera I/F Units

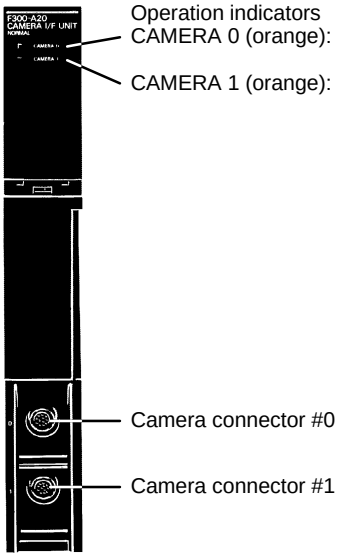
Five types of Camera I/F Unit are available: Normal, Normal/simultaneously, Shutter, Shutter/simultaneously, and Frame Shutter.

### Camera I/F Unit Models

| Unit | Input | Model | Connectable cameras | Number of cameras |
|---|---|---|---|---|
| Camera I/F Unit | Normal | F300-A20 | F300-S Camera<br>F200-S Camera | Up to two cameras per Camera I/F Unit. |
| | Normal, simultaneously | F300-A22S | | |
| | Shutter | F300-A20R | F300-S2R Shutter Camera<br>F300-S3DR Shutter Camera | |
| | Shutter, simultaneously | F300-A22RS | | |
| | Frame Shutter | F300-A23RS | F300-S4R Frame Shutter Camera | |

### Components

The following illustration shows the essential components of the F300-A2□□□ Camera I/F Units.




### Specifications

**General Specifications**

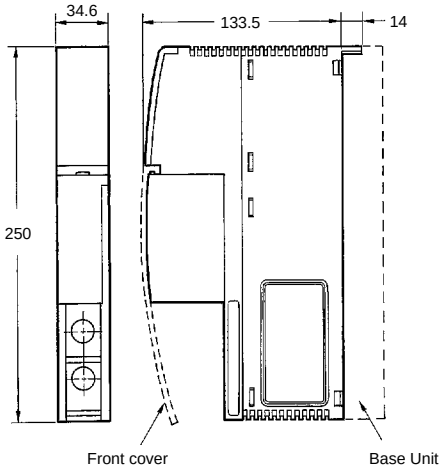
| | |
|---|---|
| **Ambient temperature** | 0°C to 50°C |
| **Ambient humidity** | 35% to 85% RH (no condensation) |
| **Ambient environment** | No corrosive gases |
| **Storage temperature** | –25°C to 65°C |
| **Degree of protection** | IP20 (in-panel) |

**Performance Specifications**

| Item | | F300-A20 | F300-A22S | F300-A20R | F300-A22RS | F300-A23RS |
|---|---|---|---|---|---|---|
| Input | | Normal | Normal/simul-taneously | Shutter | Shutter/simul-taneously | Frame Shutter |
| No. of connectable cameras | | 2 max | | | | |
| Connectable cameras | | F300-S, F200-S | F300-S | F300-S2R/S3DR | | F300-S4R |
| Sync signal output | Frequency | HD, VD both dependent on camera bus sync signal | | HD: 15.734 kHz<br>VD: 59.94 Hz | | |
| | Output amplitude | 4 Vp-p, 1-kΩ negative pulse | | 4 Vp-p, 75-Ω negative pulse | | |
| | Output pulse width | HD, VD both dependent on camera bus synchronous signal. | | HD: 6.27 μs<br>VD: 9 H | | |
| Camera power output | | 12 V, 0.8 A (for 2 cameras) | | 12 V, 0.8 A (for 2 cameras)<br>–12 V, 0.8 A (for 2 cameras) | | |
| Cable length | | 5 m (standard) | | | | |
| Weight | | Approx. 400 g | | | | |

## Dimensions and Weight

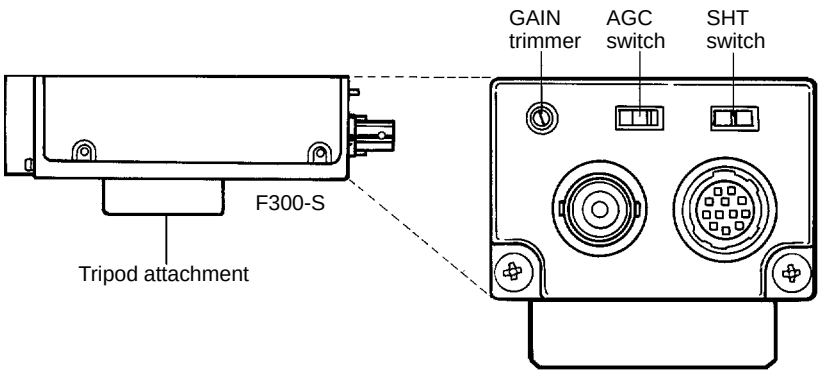
The following diagram provides the external dimensions and weight of the F300-A2□□□ Camera I/F Units. Unless otherwise noted, values are in millimeters (mm).



## 2-1-8 F300-S Camera

The following illustration shows the essential components of the F300-S Camera.

### Components




| | |
|---|---|
| **GAIN trimmer** | For the image amplifier. Do not adjust this trimmer. |
| **AGC switch** | Turns AGC on and off. Leave this switch off. |
| **SHT switch** | Turns the electronic shutter on and off. Leave this switch off. |

### Specifications

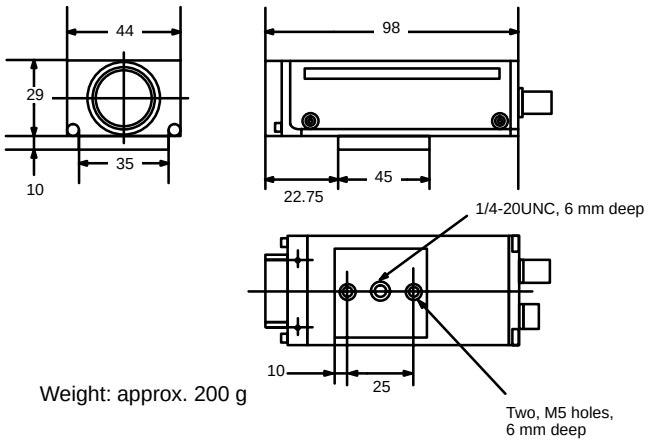
#### General Specifications

| | |
|---|---|
| **Power** | 12 VDC ±10% |
| **Ambient temperature** | 0°C to 50°C |
| **Ambient humidity** | 35% to 85% |
| **TV system** | Conforms to RS-170 |
| **Picture element** | Interline CCD |
| **Effective pixels** | 768 × 493 (H×V) |
| **Scanned area** | 8.6 x 6.6 mm (equivalent to 2/3 inch) |
| **Number of scan lines** | 525 lines |
| **Scan method** | 2:1 interlace |
| **Synchronization** | Internal/external sync (automatically switchable) |
| **Scan frequency** | Horizontal: 15.734 kHz; Vertical: 59.94 Hz |
| **Aspect ratio** | 4:3 |
| **Object illumination** | Standard: 200 lux; F4 (3,200°K); AGC: ON; $\gamma = 1.0$<br>Minimum: 0.5 lux; F1.4; GAIN: MAX; $\gamma = 0.45$ |
| **Image output** | VS: 1.0 $V_{p-p}$/75 Ω |
| **Resolution** | Horizontal: 570 lines; Vertical: 350 lines |
| **S/N ratio** | 50 $dB_{p-p}$/rms (AGC: OFF $\gamma = 1.0$) |
| **AGC** | Output level within ±2dB for rated level fluctuations of ±12 dB.<br>Switchable ON/OFF with selector on panel. OFF on delivery. |
| **Electronic shutter** | 1/1,000 s fixed. Switchable ON/OFF with selector on panel. OFF on delivery. |
| **Lens mounting** | C mount |

**Note** Use the F300-S Camera with the electronic shutter and AGC set to OFF.

## Dimensions and Weight

The following diagram provides the external dimensions and weight of the F300-S Camera. Unless otherwise noted, values are in millimeters (mm).

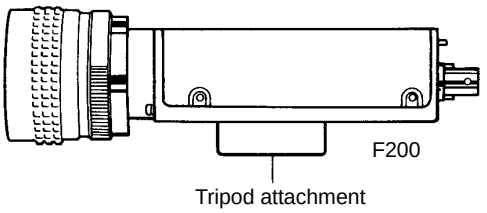



Weight: approx. 200 g

## 2-1-9 F200-S Camera

Takes images of stationary objects or moving objects using strobes.

## Components



## Specifications

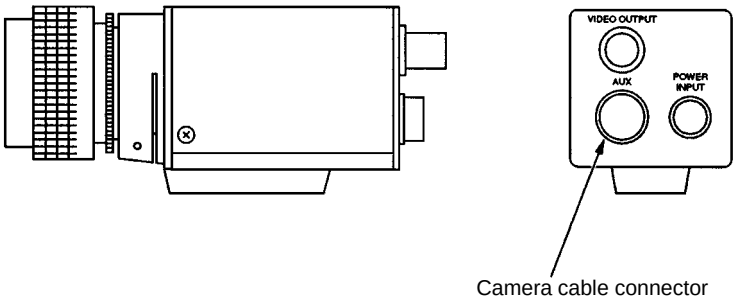
### General Specifications

| | |
|---|---|
| **Power** | 10 to 16 VDC |
| **Vibration resistance** | Vibration frequency: 10 to 150 Hz; single amplitude: 0.75 mm |
| **Impact resistance** | 196 $m/s^2$ (20G) |
| **Ambient temperature** | 0°C to 50°C |
| **Ambient humidity** | 35% to 85% RH (no condensation) |
| **Ambient environment** | No corrosive gases |
| **Storage temperature** | –25°C to 65°C |
| **Picture element** | 1/3” Interline CCD |
| **Effective pixels** | 512 × 492 (H×V) |
| **Synchronization** | Internal sync |
| **Object illumination** | Standard: 300 lux; F8<br>Minimum: 3 lux; F1.4 |
| **Resolution** | Horizontal: 350 lines (center) |
| **S/N ratio** | 50 $dB_{p-p}$/rms |
| **AGC** | OFF |
| **Electronic shutter** | --- |
| **Lens mounting** | C mount |
| **Weight** | Approx. 150 g |

## 2-1-10 F300-S2R Shutter Camera

Used for picking up images of high-speed moving objects.

## Components



## Specifications

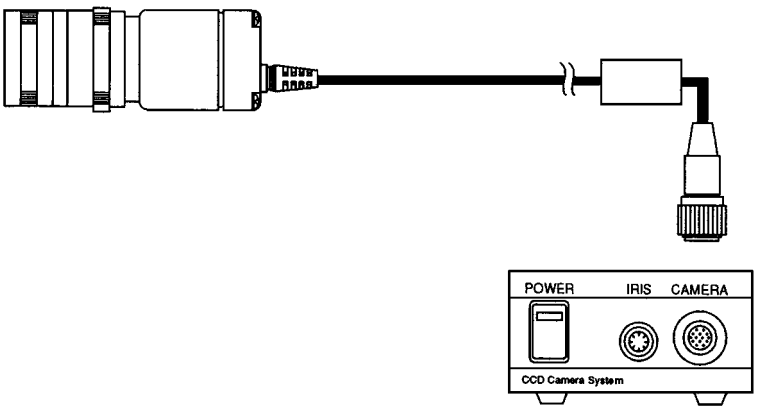
### General Specifications

| | |
|---|---|
| **Power** | 12 VDC, 0.16 A (10.5 to 20 VDC, ripple of 1 Vp-p max.) |
| **Ambient temperature** | 0°C to 50°C |
| **Ambient humidity** | 35% to 85% RH |
| **Ambient environment** | No icing |
| **Picture element** | 1/2” Interline CCD (black and white) |
| **CCD charge storage mode** | Field storage |
| **Effective pixels** | 756 × 484 (H×V) |
| **Synchronization** | External/Internal synchronization (automatically switched) |
| **External synchronization input signal** | Sync system: HD/VD<br>Input level: 2 to 5 Vp-p<br>Input impedance: 75 Ω |
| **Picture output** | VS: 1.0 Vp-p/75 Ω |
| **Resolution** | Horizontal: 570 lines min.; Vertical: 350 lines |
| **S/N ratio** | 56 dB |
| **Shutter speed** | 1/1000 s, 1/2000 s, 1/4000 s, 1/10000 s (Default: 1/2000 s) |
| **Shutter trigger input signal** | Capture timing: falling edge |
| **Shutter mode** | Sync non-reset mode |
| **Lens mounting** | C mount |
| **Weight** | Approx. 200 g |

## 2-1-11 F300-S3DR Shutter Camera

Used for picking up images of high-speed moving objects.

## Components




Camera cable connector

## Specifications

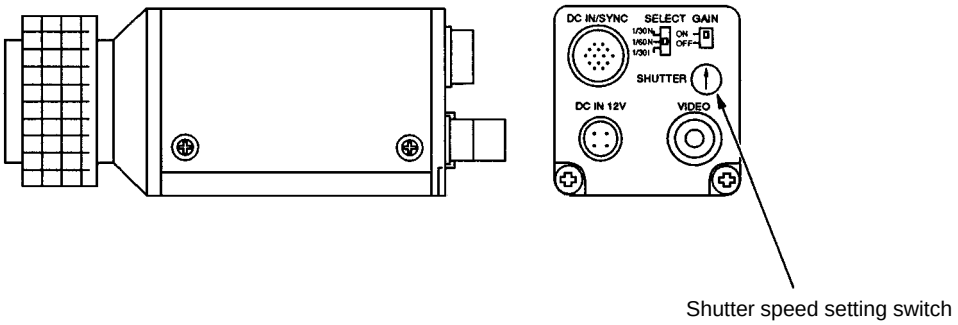
### General Specifications

| | |
|---|---|
| **Power** | 12 VDC±1.2 V |
| **Power consumption** | 3.2 VA±0.4 VA |
| **Ambient temperature** | 0°C to 50°C |
| **Ambient humidity** | 35% to 85% RH |
| **Ambient environment** | No icing |
| **Picture element** | 1/2” Image area sensor (black and white) |
| **CCD charge storage mode** | Field accumulation |
| **Effective pixels** | 768 × 494 (H×V) |
| **Synchronization** | External/Internal synchronization (automatically switched) |
| **External synchronization input signal** | Sync system: HD/VD<br>Input level: 2 to 4 Vp-p<br>Input impedance: 75 Ω |
| **Image output** | VS: 1.0 Vp-p/75 Ω |
| **Resolution** | Horizontal: 570 lines min.; Vertical: 350 lines (field) |
| **S/N ratio** | 56 dB |
| **Shutter speed** | 1/1000 s, 1/2000 s, 1/4000 s, 1/10000 s (Default: 1/2000 s) |
| **Shutter trigger input signal** | Capture timing: falling edge |
| **Shutter mode** | Sync non-reset mode |
| **Lens mounting** | C mount |
| **Cable length between the head and amplifier** | 2±0.2 m |
| **Weight** | Camera head: approx. 220 g (including cable); Body: approx. 510 g |

## 2-1-12 F300-S4R Shutter Camera

Used for picking up images of high-speed moving objects.

## Components



## Specifications

### General Specifications

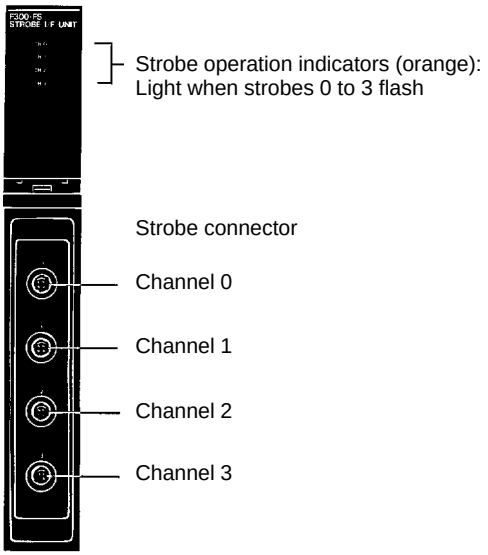
| | |
|---|---|
| **Power** | 12 VDC, 0.3 A (10.8 to 13.2 VDC, ripple of 1 Vp-p max.) |
| **Ambient temperature** | 0°C to 50°C |
| **Ambient humidity** | 35% to 85% RH |
| **Ambient environment** | No icing |
| **Picture element** | 1/2” Interline CCD (black and white) |
| **CCD format** | Field storage VGA format |
| **Effective pixels** | 659 × 494 (H×V) |
| **Synchronization** | External/Internal synchronization (automatically switched) |
| **External synchronization input signal** | Sync system: HD/VD<br>Input level: 1.5 to 4.5 Vp-p<br>Input impedance: 75 Ω |
| **Image output** | VS: 1.0 Vp-p/75 Ω |
| **Resolution** | Horizontal: 490 lines min.; Vertical: 480 lines |
| **S/N ratio** | 56 dB |
| **Shutter speed** | 1/1000 s, 1/1500 s, 1/2000 s, 1/3000 s, 1/4000 s, 1/6000 s, 1/8000 s, 1/10000 s 1/30000 s, 1/50000 s (Default: 1/2000 s) |
| **Shutter trigger input signal** | Capture timing: falling edge |
| **Shutter mode** | Full-frame mode |
| **Lens mounting** | C mount |
| **Weight** | Approx. 160 g |

# 2-2 Expansion Units

## 2-2-1 F300-FS Strobe I/F Unit

The following illustration shows the essential components of the F300-FS Strobe I/F Unit.

## Components



## Specifications

### General Specifications

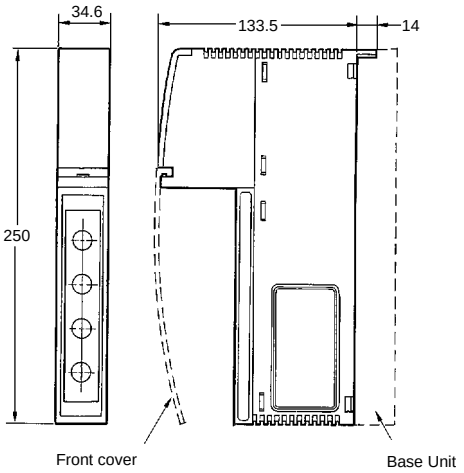
| | |
|---|---|
| **Ambient temperature** | 0°C to 50°C |
| **Ambient humidity** | 35% to 85% RH (no condensation) |
| **Ambient environment** | No corrosive gases |
| **Storage temperature** | –25°C to 65°C |
| **Degree of protection** | IP20 (in-panel) |

### Performance Specifications

| | |
|---|---|
| **Strobe connections** | 4 max. |
| **Strobe trigger output** | 20 mA max. per Unit, photocoupler output |
| **Strobe flash error input** | Photocoupler input<br>Input ON current: 3 mA min.<br>Input OFF current: 1.5 mA max. |

## Dimensions and Weight

The following diagram provides the external dimensions and weight of the F300-FS Strobe I/F Unit. Unless otherwise noted, values are in millimeters (mm).

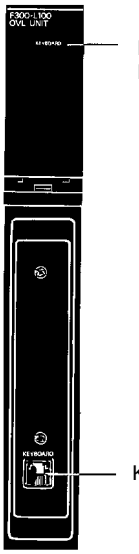



Weight: approx. 400 g

## 2-2-2 F300-L12E OVL Unit

The OVL Unit extends the capabilities of the F300 to allow it to be operated using OVL (OMRON Vision Language). OVL was developed specifically for optical recognition and image measurement to permit more sophisticated measurements with a BASIC-like language. The OVL Unit's keyboard also allows data input and system operation from the Menu mode in the same fashion as is possible from the Console.

## Component



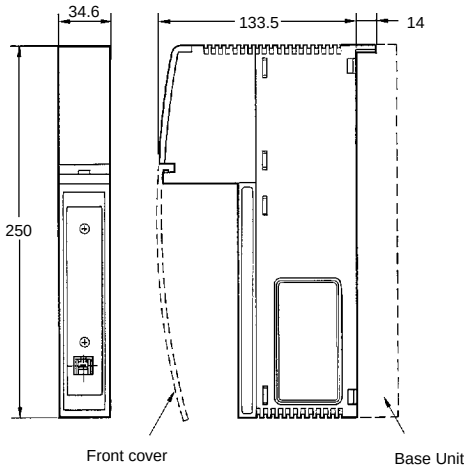

## Specifications

### General Specifications

| | |
|---|---|
| **Ambient temperature** | 0°C to 50°C |
| **Ambient humidity** | 35% to 85% RH (no condensation) |
| **Ambient environment** | No corrosive gases |
| **Storage temperature** | –25°C to 65°C |
| **Degree of protection** | IP20 (in-panel) |

## Dimensions and Weight

The following diagram provides the external dimensions and weight of the F300-L12E OVL Unit. Unless otherwise noted, values are in millimeters (mm).



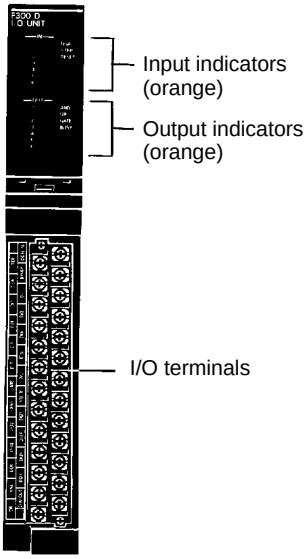

Weight: approx. 350 g

# 2-2-3 F300-D2 Terminal Block Unit

The F300-D2 Terminal Block Unit is connected to a programmable controller or other devices to input measurement commands and output measurement results.

The following illustration shows the essential components of the F300-D2 Terminal Block Unit.

## Components

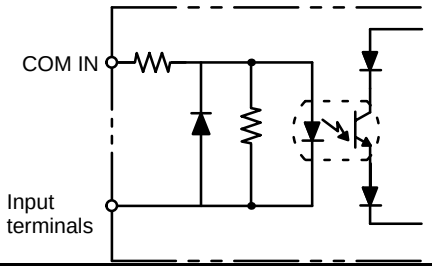



## Specifications

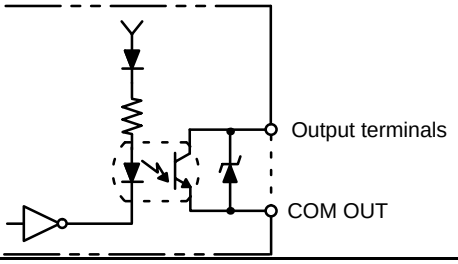
### General Specifications

| | |
|---|---|
| **Ambient temperature** | 0°C to 50°C |
| **Ambient humidity** | 35% to 85% RH (no condensation) |
| **Ambient environment** | No corrosive gases |
| **Storage temperature** | –25°C to 65°C |
| **Degree of protection** | IP20 (in-panel) |

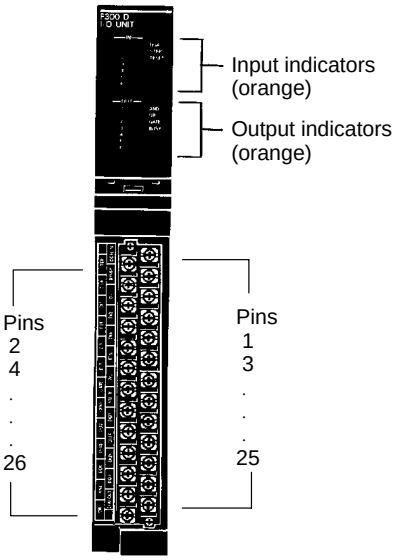
### Input Specifications

| | |
|---|---|
| **Number of inputs** | Data inputs: 8; control inputs: 4 |
| **Input voltage** | 12 to 24 VDC ±10% |
| **ON current** | 3 to 15 mA |
| **ON voltage** | 8.8 V max. |
| **OFF current** | 0.1 mA max. |
| **Input OFF voltage** | 4.5 V min. |
| **ON delay** | RESET input: 10 ms max.; other inputs: 0.5 ms max. |
| **OFF delay** | RESET input: 15 ms max.; other inputs: 0.7 ms max. |
| **DI 0 to 7** | Parallel data inputs |
| **RESET** | Resets the F300 |
| **STEP** | Runs one measurement |
| **DSA** | Requests data output with handshaking |
| **Internal circuit** |  |

### Output Specifications

| | |
|---|---|
| **Number of outputs** | Data outputs: 8<br>AND/OR outputs: 2 |
| **Output voltage** | 12 to 24 VDC ±10% |
| **Load current** | 100 mA max. |
| **ON residual voltage** | 2 V max. |
| **OFF leak current** | 0.1 mA max. |
| **DO 0 to 7** | Parallel data outputs |
| **BUSY** | Disables inputs during measurement |
| **GATE** | For data output timing |
| **AND** | AND output of evaluations on all windows |
| **OR** | OR output of evaluations on all windows |
| **Internal circuit** |  |

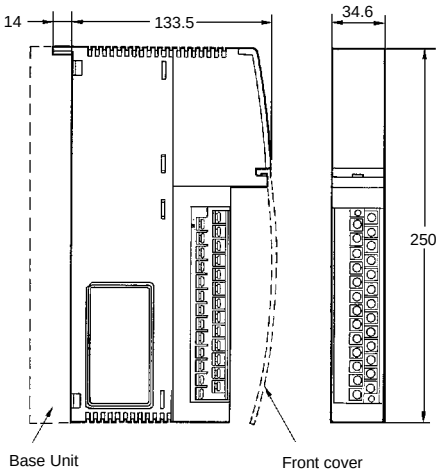
## Terminal Allocations




| Pin no. | Name | | Pin no. | Name | |
|---|---|---|---|---|---|
| 1 | COM IN (for input) | | 14 | GATE | |
| 2 | STEP | | 15 | BUSY | |
| 3 | RESET | | 16 | DO 0 | Data output |
| 4 | DSA | | 17 | DO 1 | |
| 5 | DI 0 | Data input | 18 | DO 2 | |
| 6 | DI 1 | | 19 | DO 3 | |
| 7 | DI 2 | | 20 | DO 4 | |
| 8 | DI 3 | | 21 | DO 5 | |
| 9 | DI 4 | | 22 | DO 6 | |
| 10 | DI 5 | | 23 | DO 7 | |
| 11 | DI 6 | | 24 | AND | |
| 12 | DI 7 | | 25 | COM OUT (for output) | |
| 13 | NC | | 26 | OR | |

## Dimensions and Weight

The following diagram provides the external dimensions and weight of the F300-D2 Terminal Block Unit. Unless otherwise noted, values are in millimeters (mm).



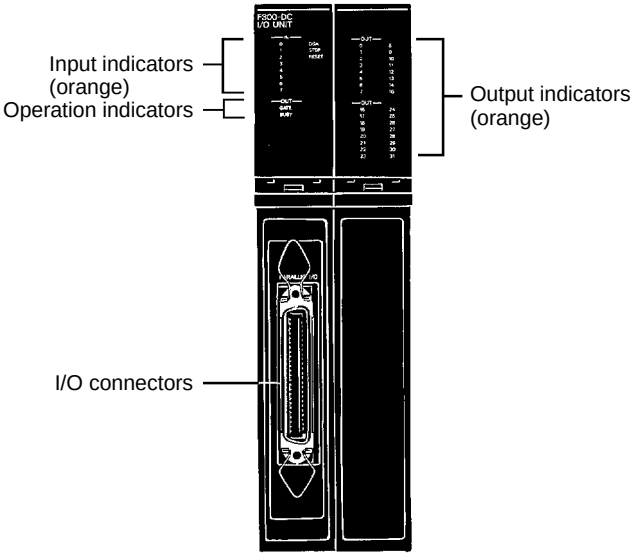

Weight: approx. 550 g

## 2-2-4 F300-DC2 Parallel I/O Unit

The F300-DC2 Parallel I/O Unit is connected to a programmable controller or other device to input measurement commands and output measurement results.

The following illustration shows the essential components of the F300-DC2 Parallel I/O Unit.

### Components

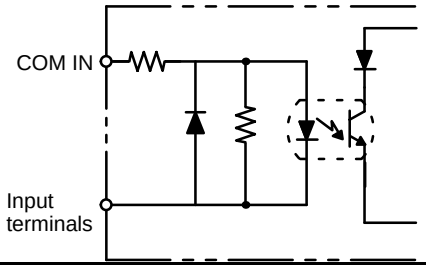



### Specifications

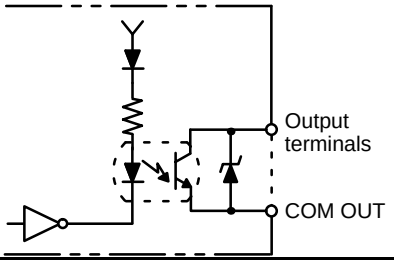
**General Specifications**

| | |
|---|---|
| **Ambient temperature** | 0°C to 50°C |
| **Ambient humidity** | 35% to 85% RH (no condensation) |
| **Ambient environment** | No corrosive gases |
| **Storage temperature** | –25°C to 65°C |
| **Degree of protection** | IP20 (in-panel) |

### Input Specifications

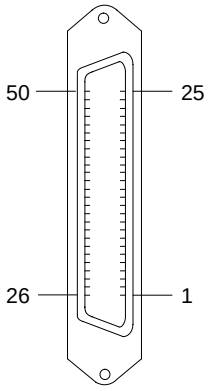
| | |
|---|---|
| **Number of inputs** | Data inputs: 8 |
| **Input voltage** | 12 to 24 VDC ±10% |
| **ON current** | 3 to 15 mA |
| **ON voltage** | 8.8 V max. |
| **OFF current** | 0.1 mA max. |
| **OFF voltage** | 4.5 V min. |
| **ON delay** | RESET input: 10 ms max.; other inputs: 0.5 ms max. |
| **OFF delay** | RESET input: 15 ms max.; other inputs: 0.7 ms max. |
| **Internal circuit** |  |

### Output Specifications

| | |
|---|---|
| **Number of outputs** | Data outputs: 32 |
| **Output voltage** | 12 to 24 VDC ±10% |
| **Load current** | 100 mA max. |
| **ON residual voltage** | 2 V max. |
| **OFF leak current** | 0.1 mA max. |
| **Internal circuit** |  |

## Terminal Allocation

| No. | Signal name | | No. | Signal name | |
|---|---|---|---|---|---|
| 1 | COM OUT (for output) | | 26 | COM OUT (for output) | |
| 2 | DO 31 | Data outputs | 27 | DO 30 | Data outputs |
| 3 | DO 29 | | 28 | DO 28 | |
| 4 | DO 27 | | 29 | DO 26 | |
| 5 | DO 25 | | 30 | DO 24 | |
| 6 | DO 23 | | 31 | DO 22 | |
| 7 | DO 21 | | 32 | DO 20 | |
| 8 | DO 19 | | 33 | DO 18 | |
| 9 | DO 17 | | 34 | DO 16 | |
| 10 | DO 15 | | 35 | DO 14 | |
| 11 | DO 13 | | 36 | DO 12 | |
| 12 | DO 11 | | 37 | DO 10 | |
| 13 | DO 09 | | 38 | DO 08 | |
| 14 | DO 07 | | 39 | DO 06 | |
| 15 | DO 05 | | 40 | DO 04 | |
| 16 | DO 03 | | 41 | DO 02 | |
| 17 | DO 01 | | 42 | DO 00 | |
| 18 | BUSY | | 43 | GATE | |
| 19 | NC | | 44 | DI 7 | Data inputs |
| 20 | DI 6 | Data inputs | 45 | DI 5 | |
| 21 | DI 4 | | 46 | DI 3 | |
| 22 | DI 2 | | 47 | DI 1 | |
| 23 | DI 0 | | 48 | DSA | |
| 24 | RESET | | 49 | STEP | |
| 25 | COM IN (for input) | | 50 | COM IN (for input) | |




**Inputs**

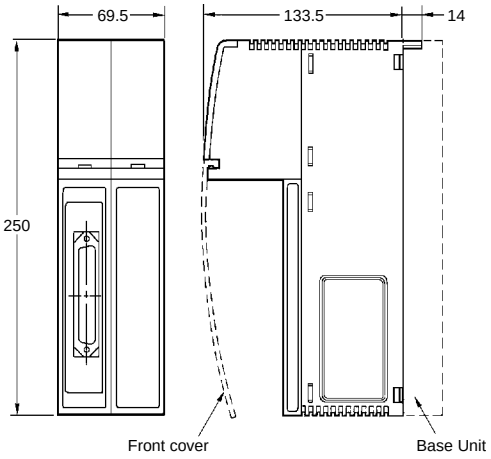
| | |
|---|---|
| **DI 0 to 7** | Parallel data inputs |
| **RESET** | Resets the F300 |
| **STEP** | Runs one measurement |
| **DSA** | Requests data output with handshaking |

**Outputs**

| | |
|---|---|
| **DO 0 to 31** | Parallel data outputs |
| **BUSY** | Disables inputs during measurement |
| **GATE** | For data output timing |

## Dimensions and Weight

The following diagram provides the external dimensions and weight of the F300-DC2 Parallel I/O Unit. Unless otherwise noted, values are in millimeters (mm).



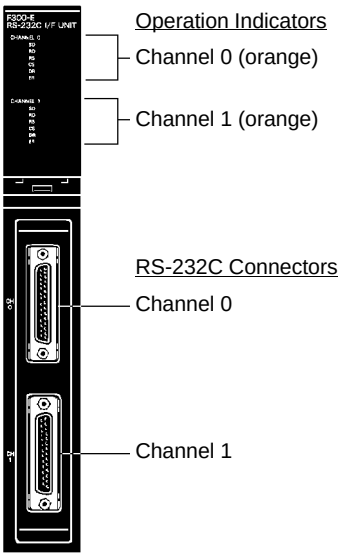

Weight: approx. 800 g

## 2-2-5 F300-E2 RS-232C I/F Unit

The RS-232C exchanges data with a personal computer or other device via the RS-232C interface. Menu operation and data settings are possible directly from the computer.

The following illustration shows the essential components of the F300-E2 RS-232C I/F Unit.

## Components




## Specifications

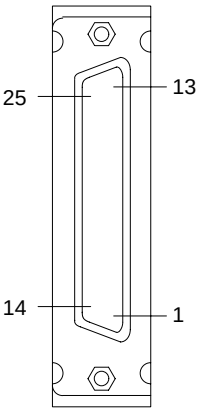
### General Specifications

| | |
|---|---|
| **Ambient temperature** | 0°C to 50°C |
| **Ambient humidity** | 35% to 85% RH (no condensation) |
| **Ambient environment** | No corrosive gases |
| **Storage temperature** | –25°C to 65°C |
| **Degree of protection** | IP20 (in-panel) |

**Communications Specifications**

| | |
|---|---|
| **Number of channels** | 2 channels |
| **Electrical ratings** | Conform to EIA RS-232C |
| **Synchronization** | Non-synchronous |
| **Transmission speed** | 19,200 bps max. |

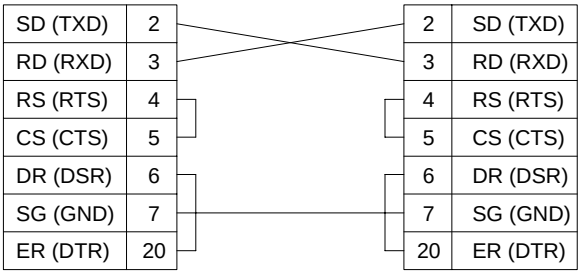
## Connector Pin Allocation




| Pin no. | Signal name | Name |
|---|---|---|
| **1** | FG (GND) | Frame ground |
| **2** | SD (TXD) | Send data |
| **3** | RD (RXD) | Receive data |
| **4** | RS (RTS) | Request to send |
| **5** | CS (CTS) | Clear to send |
| **6** | DR (DSR) | Data set ready |
| **7** | SG (GND) | Signal ground |
| **20** | ER (DTR) | Data terminal ready |

**Connecting a Computer with a RS-232C I/F Unit**

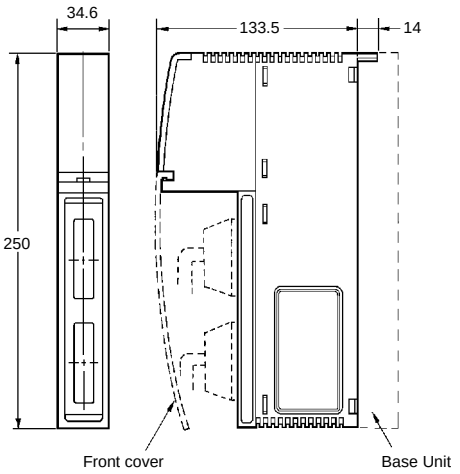
Connect the F300-VR as shown below.




**Note** The F300-VR uses a 25-pin connector. Be sure to check the pin arrangement of the computer before wiring.
Use only shielded RS-232C cable.

## Dimensions and Weight

The following diagram provides the external dimensions and weight of the F300-E2 RS-232C I/F Unit. Unless otherwise noted, values are in millimeters (mm).




Weight: approx. 400 g

# 2-2-6 F300-G Dummy Unit

The F300-G Dummy Unit is inserted into empty slots to improve external appearance, protect connectors, and maintain the strength of the Rack. The Dummy Unit plays no role in measurements and consumes no power.

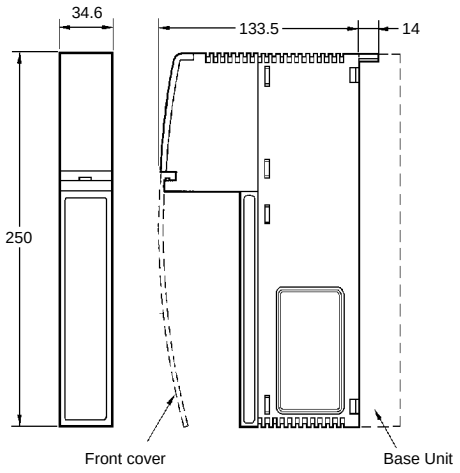
## Specifications

### General Specifications

| | |
|---|---|
| **Ambient temperature** | 0°C to 50°C |
| **Ambient humidity** | 35% to 85% RH (no condensation) |
| **Ambient environment** | No corrosive gases |
| **Storage temperature** | –25°C to 65°C |
| **Degree of protection** | IP20 (in-panel) |

## Dimensions and Weight

The following diagram provides the external dimensions and weight of the F300-G Dummy Unit. Unless otherwise noted, values are in millimeters (mm).




Weight: approx. 200 g

# 2-3 F300 Camera Lenses

## 2-3-1 Types of Lens

The camera used with the F300 System can use a 4.8 to 75 mm CCTV lens or a 2x to 6x magnification lens. The selection of the correct lens between wide-angle and macro from this range allows optimum camera field-of-view and mounting distance. The camera requires a C-mount lens.

C-mount lenses other than those listed below can also be used. When using C-mount lenses other than those recommended, determine the field-of-view and mounting distance by trial and error.

**CCTV Lens**

| Model | Focal distance | Illumination | Max. external diameter | Total length | Filter size |
|---|---|---|---|---|---|
| 3Z4S-LE C418DX | 4.8 mm | F1.8 | 40.5 mm dia. | 35.5 mm | --- |
| 3Z4S-LE B618DX | 6.5 mm | F1.8 | 48 mm dia. | 42 mm | |
| 3Z4S-LE C815B | 8.5 mm | F1.5 | 42 mm dia. | 40 mm | M40.5 x P0.5 |
| 3Z4S-LE B1214D-2 | 12.5 mm | F1.4 | 42 mm dia. | 50 mm | |
| 3Z4S-LE C1614A | 16.0 mm | F1.4 | 30 mm dia. | 33 mm | M27 x P0.5 |
| 3Z4S-LE B2514D | 25.0 mm | F1.4 | 30 mm dia. | 37.3 mm | |
| 3Z4S-LE B5014A | 50.0 mm | F1.4 | 48 mm dia. | 48 mm | M46 x P0.75 |
| 3Z4S-LE B7514C | 75.0 mm | F1.4 | 62 mm dia. | 79 mm | M58 x P0.75 |

**Magnification Lens**

| Model | Magnification | Illumination | End diameter |
|---|---|---|---|
| 3Z4S-LE MML 2-65 | 2 | F5.6 | 16 mm dia. |
| 3Z4S-LE MML 4-65 | 4 | F5.7 | |
| 3Z4S-LE MML 6-65 | 6 | F6.1 | |

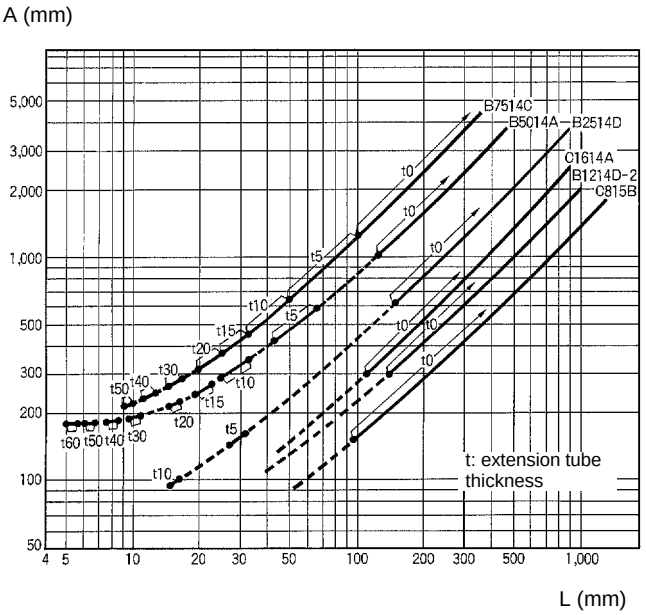
**Zoom Lens**

| Model | Operation | Focal distance | Filter size |
|---|---|---|---|
| 3Z4S-LE C6Z1218 | Manual | 12.5 to 75 mm | M49 x P0.75 |

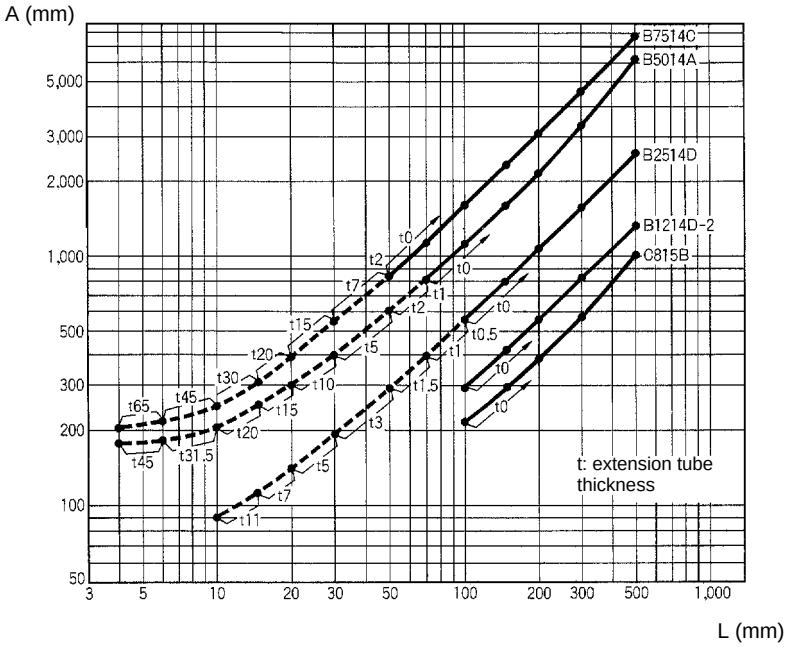
## 2-3-2 Optical Charts

An optical chart shows the relationship between the lens (the diagonal lines on the graph), camera distance (A), extension tube thickness (t), and field of vision (L). Logarithms are written for the field of vision along the horizontal axis and the camera distance along the vertical axis. Use optical charts as references for selecting the lens appropriate for a particular measured object. Optical charts vary according to the camera's CCD size, so be sure to use an optical chart that conforms to the camera that is being used.

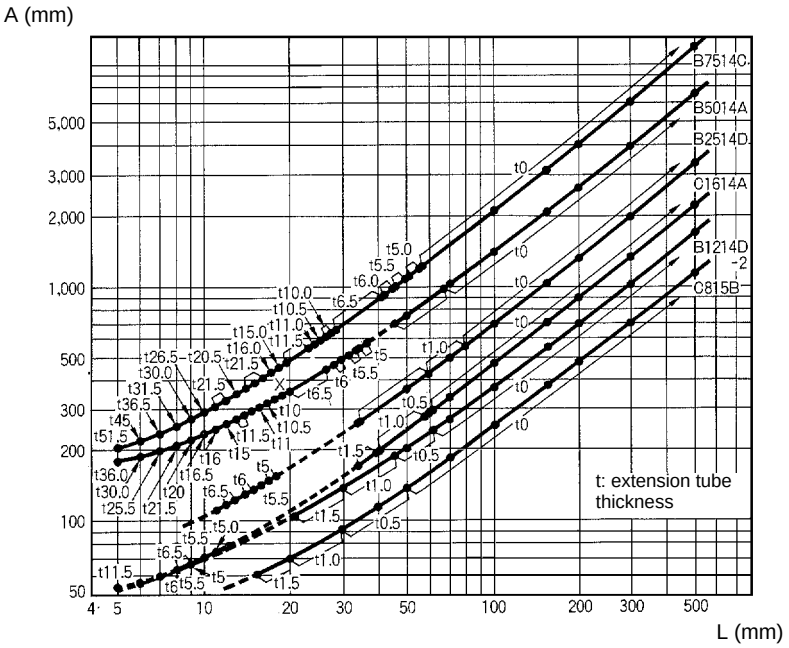
### F300-S Cameras




### F300-S2R/S3DR/S4R Cameras



**F200-S Cameras**




## 2-3-3 CCTV Lens, Field of Vision and Mounting Distance

In this table, A = camera distance, WD = working distance, and t = extension tube thickness. The following figures are approximate standards. Allow for some fine adjustment at the time of installation.

(Unit: mm)

F300-S Cameras

| Lens | Field of vision | | 5 | 7 | 10 | 15 | 20 | 30 | 50 | 70 | 100 | 150 | 200 | 300 | 500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CCTV lens | 3Z4S-LE C815B | A | | | | | | | 88.5 | 114.3 | 153.2 | 218.2 | 283.3 | 413.7 | 674.4 |
| | | WD | | | | | | | 47.4 | 73.5 | 112.6 | 177.8 | 243.0 | 373.5 | 634.3 |
| | | t | | | | | | | 1.0 | 0.5 | --- | --- | --- | --- | --- |
| | 3Z4S-LE B1214D-2 | A | | | | 64.0 | | | 127.8 | 166.0 | 223.7 | 320.1 | 416.6 | 609.9 | 996.5 |
| | | WD | | | | 8.5 | | | 76.1 | 114.8 | 172.8 | 269.5 | 366.2 | 559.6 | 946.4 |
| | | t | | | | 5.0 | | | 1.5 | 1.0 | 0.5 | --- | --- | --- | --- |
| | 3Z4S-LE C1614A | A | | | | | 73.5 | | 144.6 | 193.5 | 267.2 | 390.6 | 514.1 | 761.4 | 1256.2 |
| | | WD | | | | | 35.2 | | 109.4 | 158.9 | 233.2 | 356.9 | 480.6 | 728.1 | 1233.0 |
| | | t | | | | | 5.0 | | 1.5 | 1.0 | --- | --- | --- | --- | --- |
| | 3Z4S-LE B2514D | A | | | 87.4 | 101.0 | 117.4 | 152.8 | 226.9 | 302.2 | 415.9 | 606.1 | 796.5 | 1177.6 | 1940.1 |
| | | WD | | | 33.8 | 52.8 | 71.9 | 110.0 | 186.3 | 262.6 | 377.0 | 567.7 | 758.4 | 1139.8 | 1902.5 |
| | | t | | | 15.0 | 10.0 | 6.0 | 5.0 | 1.5 | --- | --- | --- | --- | --- | --- |
| | 3Z4S-LE B5014A | A | 183.3 | 179.9 | 188.7 | 216.0 | 248.7 | 319.5 | 467.7 | | 845.9 | 1226.2 | 1607.1 | 2369.3 | 3894.6 |
| | | WD | 69.9 | 85.2 | 108.0 | 146.2 | 184.3 | 260.6 | 413.2 | | 794.6 | 1176.0 | 1557.4 | 2320.2 | 3845.9 |
| | | t | 65.0 | 45.0 | 30.0 | 20.0 | 15.0 | 10.0 | 5.0 | | 1.5 | --- | --- | --- | --- |
| | 3Z4S-LE B7514C | A | | 204.4 | 217.7 | 258.6 | 307.7 | 414.1 | 636.7 | 863.0 | 1204.6 | 1775.8 | 2347.8 | 3492.6 | 5783.2 |
| | | WD | | 55.2 | 89.6 | 146.9 | 204.2 | 318.7 | 547.9 | 777.0 | 1120.7 | 1693.5 | 2266.3 | 3411.9 | 5703.2 |
| | | t | | 70.0 | 50.0 | 31.0 | 25.0 | 15.0 | 10.0 | 6.0 | 5.0 | 5.0 | --- | --- | --- |

(Unit: mm)

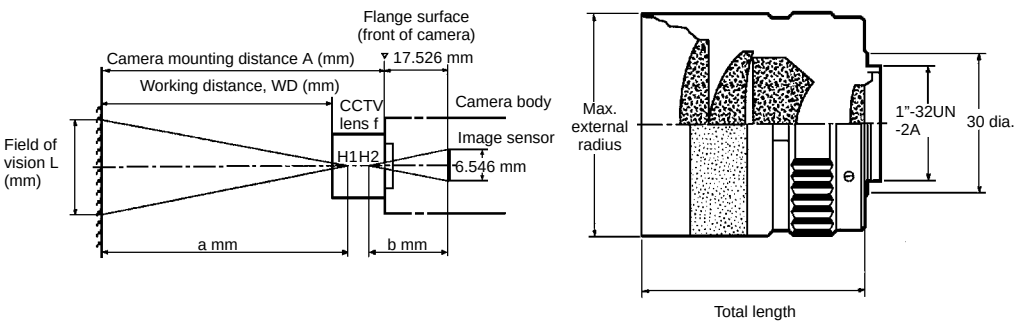
F300-S2R/S3DR/S4R Cameras

| Lens | Field of vision | | 5 | 7 | 10 | 15 | 20 | 30 | 50 | 70 | 100 | 150 | 200 | 300 | 500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CCTV lens | 3Z4S-LE C815B | A | | | | | | 76.9 | 111.9 | 147.3 | 200.5 | 289.3 | 378.1 | 555.9 | 911.6 |
| | | WD | | | | | | 35.5 | 71.1 | 106.7 | 160.0 | 249.0 | 337.9 | 515.8 | 871.5 |
| | | t | | | | | | 1.0 | 0.5 | --- | --- | --- | --- | --- | --- |
| | 3Z4S-LE B1214D-2 | A | | | | | | 110.6 | 162.5 | 214.9 | 293.8 | 425.4 | 557.2 | 820.8 | 1348.2 |
| | | WD | | | | | | 58.6 | 111.3 | 164.1 | 243.2 | 375.0 | 506.9 | 770.6 | 1298.1 |
| | | t | | | | | | 1.5 | 1.0 | 0.5 | --- | --- | --- | --- | --- |
| | 3Z4S-LE C1614A | A | | | | 74.5 | | 122.6 | 189.0 | 256.1 | 357.0 | 525.4 | 694.0 | 1031.4 | 1706.2 |
| | | WD | | | | 36.3 | | 87.0 | 154.5 | 221.9 | 323.2 | 491.9 | 660.6 | 998.1 | 1673.0 |
| | | t | | | | 5.0 | | 1.5 | 1.0 | --- | --- | --- | --- | --- | --- |
| | 3Z4S-LE B2514D | A | | 86.5 | 96.9 | 118.9 | 142.9 | 193.0 | 295.4 | 398.7 | 554.2 | 813.9 | 1073.7 | 1593.6 | 2633.7 |
| | | WD | | 32.0 | 47.6 | 73.6 | 99.7 | 151.7 | 255.7 | 359.7 | 515.7 | 775.8 | 1035.8 | 1555.9 | 2596.2 |
| | | t | | 15.0 | 10.0 | 6.0 | 5.0 | 1.5 | --- | --- | --- | --- | --- | --- | --- |
| | 3Z4S-LE B5014A | A | 179.7 | 186.8 | 207.8 | 251.8 | 299.8 | 399.8 | | 811.4 | 1122.5 | 1641.8 | 2161.6 | 3201.5 | 5281.8 |
| | | WD | 83.8 | 104.6 | 135.8 | 187.8 | 239.8 | 343.8 | | 760.0 | 1072.1 | 1592.2 | 2112.4 | 3152.7 | 5233.3 |
| | | t | 46.0 | 31.5 | 21.5 | 15.0 | 10.0 | 6.0 | | 1.5 | --- | --- | --- | --- | --- |
| | 3Z4S-LE B7514C | A | 204.2 | 214.8 | 246.3 | 312.4 | 384.5 | 534.8 | 824.4 | 1152.8 | 1620.0 | 2400.0 | 3180.6 | 4742.3 | 7866.5 |
| | | WD | 53.2 | 84.4 | 131.3 | 209.4 | 287.5 | 443.8 | 756.2 | 1068.7 | 1537.4 | 2318.6 | 3099.8 | 4662.1 | 7786.8 |
| | | t | 70.0 | 50.0 | 35.0 | 25.0 | 16.0 | 10.0 | 6.0 | 5.0 | 5.0 | --- | --- | --- | --- |

(Unit: mm)

F200-S Cameras

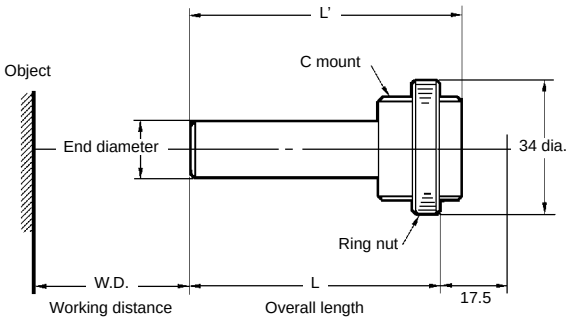
| Lens | Field of vision | | 5 | 7 | 10 | 15 | 20 | 30 | 50 | 70 | 100 | 150 | 200 | 300 | 500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CCTV lens | 3Z4S-LE C815B | A | | | | | | 92.6 | 138.5 | 184.6 | 253.9 | 369.5 | 485.1 | 716.4 | 1179.1 |
| | | WD | | | | | | 51.6 | 97.9 | 144.1 | 213.6 | 329.2 | 444.9 | 676.3 | 1139.1 |
| | | t | | | | | | 0.5 | 0.5 | --- | --- | --- | --- | --- | --- |
| | 3Z4S-LE B1214D-2 | A | | | | | | 133.9 | 201.9 | 270.3 | 373.0 | 544.3 | 715.8 | 1058.8 | 1744.8 |
| | | WD | | | | | | 82.4 | 151.0 | 219.6 | 322.5 | 494.0 | 665.6 | 1008.6 | 1694.8 |
| | | t | | | | | | 1.0 | 0.5 | --- | --- | --- | --- | --- | --- |
| | 3Z4S-LE C1614A | A | | | | | | 152.4 | 239.4 | 326.9 | 458.3 | 677.6 | 897.0 | 1335.8 | 2213.7 |
| | | WD | | | | | | 117.4 | 205.2 | 293.0 | 424.7 | 644.2 | 863.7 | 1302.6 | 2180.6 |
| | | t | | | | | | 1.5 | 0.5 | --- | --- | --- | --- | --- | --- |
| | 3Z4S-LE B2514D | A | | 93.5 | | 140.6 | | 239.0 | 373.1 | 507.8 | 710.4 | 1048.4 | 1386.5 | 2062.9 | 3415.9 |
| | | WD | | 43.0 | | 97.1 | | 198.6 | 333.9 | 469.2 | 672.2 | 1010.5 | 1348.7 | 2025.3 | 3378.4 |
| | | t | | 11.0 | | 5.0 | | 1.0 | --- | --- | --- | --- | --- | --- | --- |
| | 3Z4S-LE B5014A | A | 184.3 | 200.8 | 233.5 | 295.0 | 359.6 | 491.9 | 760.1 | 1029.7 | 1434.8 | 2110.9 | 2787.2 | 4140.1 | 6846.4 |
| | | WD | 99.4 | 126.5 | 167.1 | 234.7 | 302.4 | 437.7 | 708.4 | 979.0 | 1385.0 | 2061.6 | 2738.3 | 4091.5 | 6798.0 |
| | | t | 35.0 | 25.0 | 16.0 | 10.0 | 6.5 | 5.0 | 1.5 | --- | --- | --- | --- | --- | --- |
| | 3Z4S-LE B7514C | A | 211.0 | 235.8 | 285.0 | 377.3 | 474.3 | 673.0 | 1075.7 | 1480.6 | 2089.1 | 3104.4 | 4120.1 | 6152.0 | 10216.3 |
| | | WD | 76.7 | 117.3 | 178.3 | 279.9 | 381.5 | 584.7 | 991.2 | 1397.7 | 2007.4 | 3023.5 | 4039.7 | 6072.0 | 10136.7 |
| | | t | 55.0 | 40.0 | 25.0 | 16.0 | 15.0 | 10.0 | 5.0 | 5.0 | --- | --- | --- | --- | --- |



## 2-3-4 Magnification Lens, Field of Vision and Working Distance

| Model | Magnification | Field of vision (see note) | Working distance ($W_D$) | Total length L | L' | End diameter |
|---|---|---|---|---|---|---|
| 3Z4S-LE MML 2-65 | 2 | V3.3 x H4.4 | 65 | 67.6 | 71.6 | 16 mm dia. |
| 3Z4S-LE MML 4-65 | 4 | --- | 65.7 | 66.7 | 70.7 | |
| 3Z4S-LE MML 6-65 | 6 | --- | 65 | 82.5 | 86.5 | |

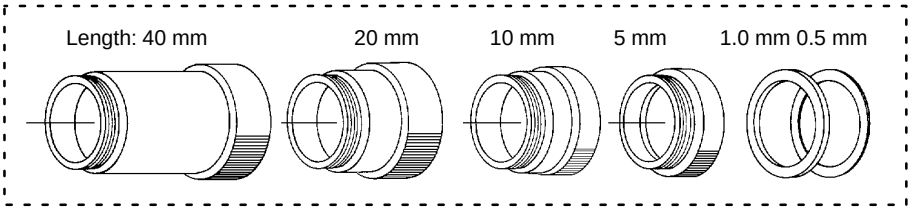
**Note** The field of vision is for the 2/3-inch CCD and is indicated in mm.




## 2-3-5 Extension Tubes

Extension tubes are used to move the camera closer to the object, outside the focal adjustment range of the lens. The tubes are available as a set of six.

| Model | Thickness | Comment |
|---|---|---|
| **3Z4S-LE EX-C6** | 0.5 mm, 1 mm, 5 mm, 10 mm, 20 mm, 40 mm | Use a combination of tubes to give the required thickness. |

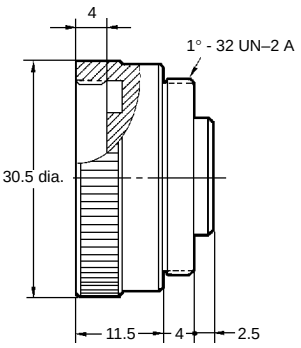



## 2-3-6 Teleconverter

Insert the Teleconverter between the lens and the camera to double the focal length.

| Model | Max external diameter | Thickness |
|---|---|---|
| **3Z4S-LE 2-EX** | 30. 5 mm | 11.5 mm |

The following diagram provides the external dimensions for the 2-EX Teleconverter used with the F300 System. Unless otherwise noted, values are in millimeters (mm).



**Note** The focal length and brightness change in proportion to the teleconverter magnification. Note that the markings on the lens focus ring and aperture ring are not accurate when the teleconverter is used. These settings must be adjusted to compensate for the teleconverter magnification factor.

# SECTION 3
# Installation

This section describes the operational, installation, and wiring requirements of the F300 System.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3-1-1 Location . . . . . 44
3-1-2 Installation . . . . . 44
3-1-3 Precautions . . . . . 45
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3-5 System Setup . . . . . 53
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# 3-1 Installation Environment

The F300 System is highly reliable and resistant to environmental factors. The following guidelines, however, must be followed to ensure reliability and to get full use of the System.

## 3-1-1 Location

Do not install an F300 System in locations subject the following conditions:

- Temperatures outside 0°C to 50°C
- Condensation due to rapid temperature fluctuations
- Relative humidity outside 35% to 85% RH
- Corrosive or flammable gas
- High concentrations of dust, salt, or iron particles
- Direct vibration or shock
- Direct sunlight
- Water, oil, or chemicals fumes or spray

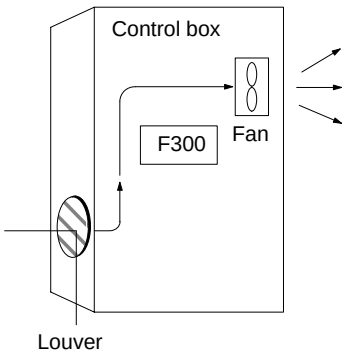
## 3-1-2 Installation

Consider environmental factors and ease of operation and maintenance when installing the F300 System in a control box.

**Temperature Considerations**

The operational temperature range of the F300 System is 0°C to 50°C. Take the following measures to maintain the F300 System in this range.

- Maintain a minimum of 50-mm clearance above and below the F300 System to improve air flow.
- Do not install the F300 System immediately above strong heat sources, such as heaters, transformers, or large-capacity resistors.
- Provide a forced-air fan or air conditioning if the ambient temperature exceeds 50°C.

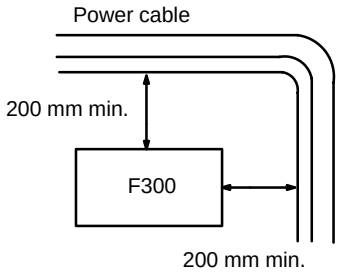



**Operation and Maintenance Considerations**

Keep the F300 System away from high-voltage equipment and motors to improve safety during operation and maintenance. The F300 System is easiest to work with if installed between 1.0 and 1.6 meters above the floor.

**Noise Considerations**

Do not install the F300 System in a cabinet containing high-voltage equipment or within 200 mm of power lines. Fully ground the mounting plate.

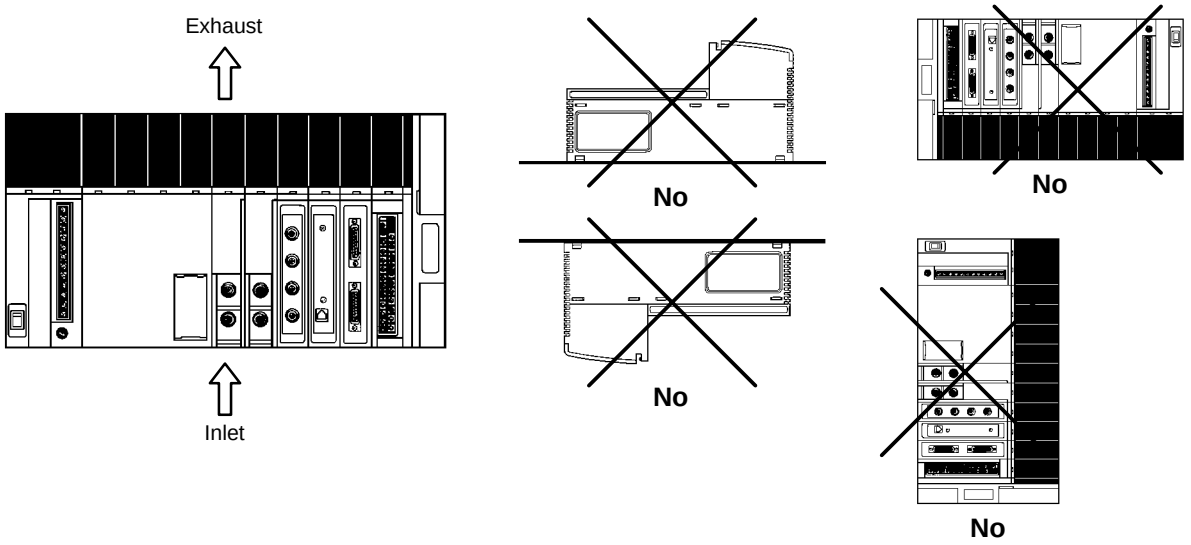


**Important** In order to protect the Units from electrostatic discharge, operators must discharge static electricity from themselves before touching the uninsulated parts of the signal lines in the terminal block and the connector. For example, a grounded wrist strap can be used for the discharging.

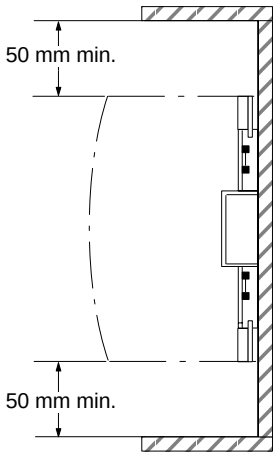
## 3-1-3 Precautions

**Direction of Installation**

Install the Unit vertically with the vents at the top and bottom to improve air circulation and heat dissipation. Do not install as shown in the right portion of the diagram below.




**Clearance**



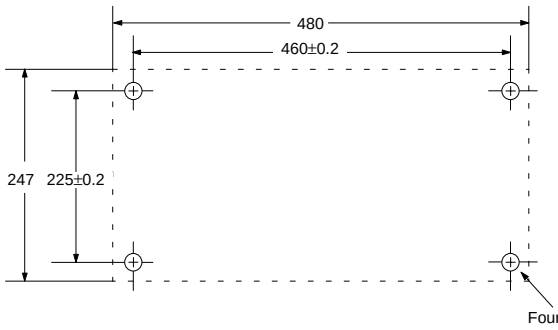

Maintain at least 50 mm clearance above and below the F300 System to improve air circulation.

**Important** Observe the following precautions when securing a monitor:

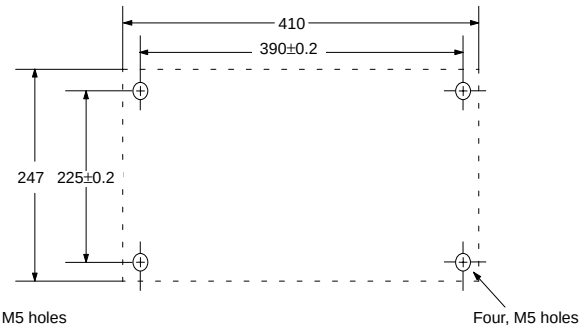
- Don't ground the monitor case.
- Make sure that there is no electrical conduction between the BNC terminals and the metallic mounting face.
- Use plastic screws if the Unit is to be mounted on a metal surface.

# 3-2 Base Unit Installation

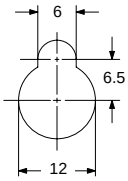
**F300-B52 Base Unit Mounting Hole Dimensions**




**F300-B32 Base Unit Mounting Hole Dimensions**




**Finished Dimensions of Base Unit Mounting Holes**

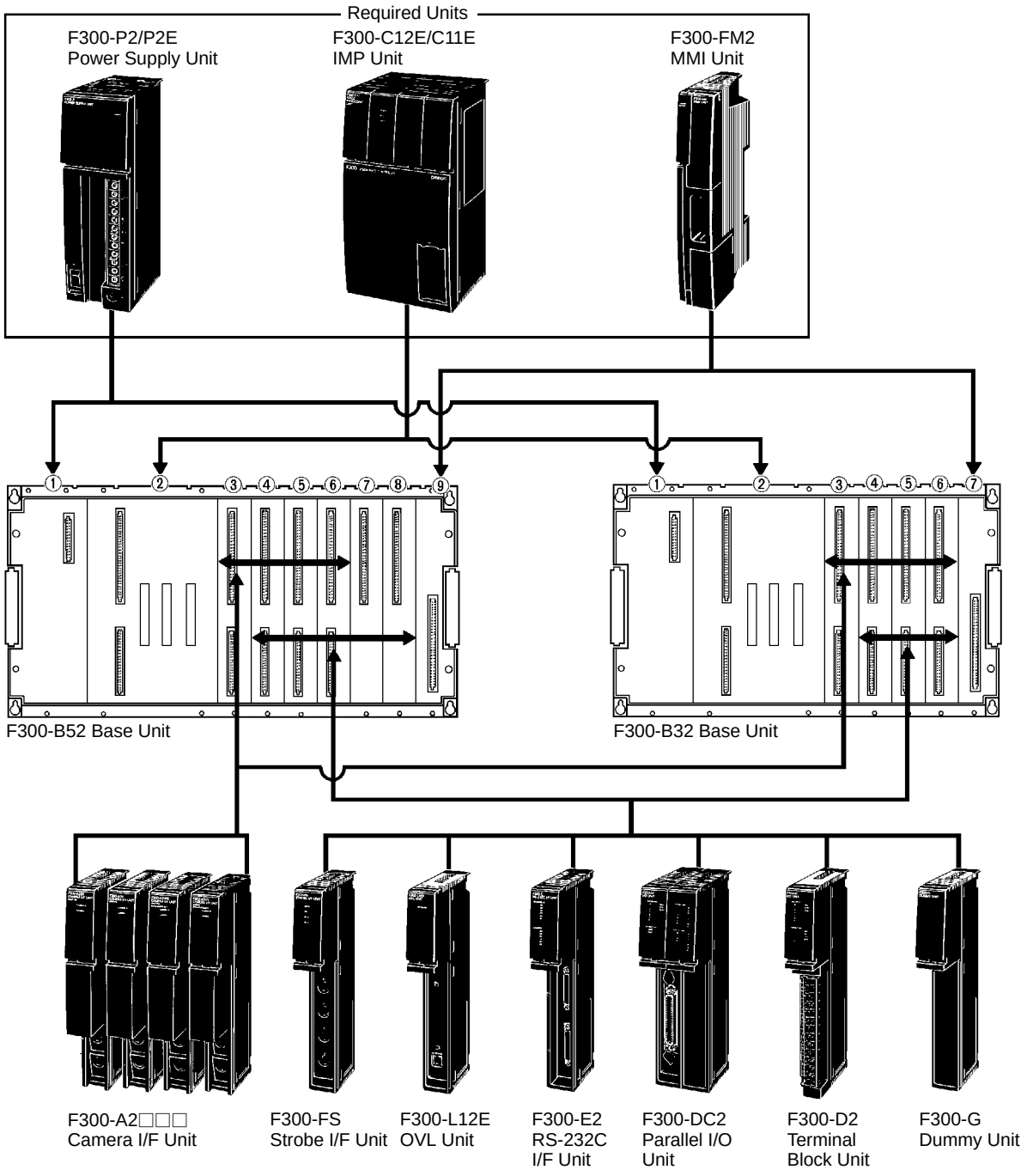


# 3-3 Mounting the Units

## 3-3-1 Mounting Positions

The Camera I/F Units can be mounted of slots 3 to 6 of the 3-slot or 5-slot Base Unit.

Expansion Units can be mounted of slots 4 to 8 of the 5-slot Base Unit or of slots 4 to 6 in the 3-slot Base Unit.




**Note** When mounting multiple Units, move the Camera Units toward the IMP Unit.

**Number of Mountable Units**

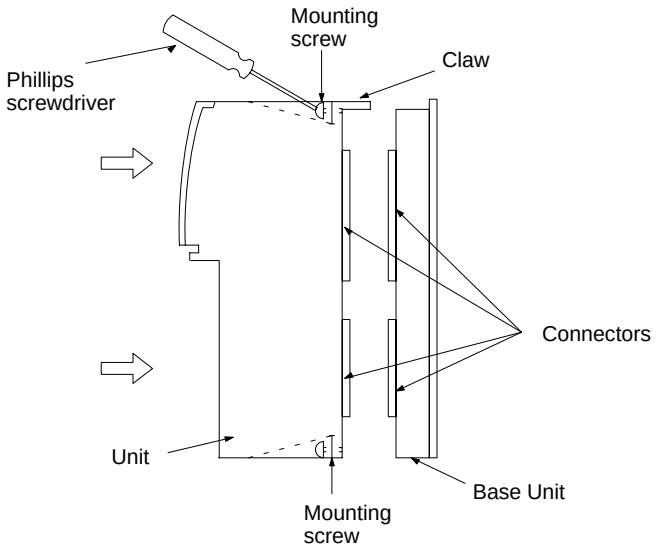
| Type | Name | Model | 5-slot Base Unit (F300-B52) | | 3-slot Base Unit (F300-B32) | |
|---|---|---|---|---|---|---|
| | | | Slot | Max. number | Slot | Max. number |
| Required units | Power Supply Unit | F300-P2 | 1 | 1 | 1 | 1 |
| | | F300-P2E | | | | |
| | IMP Unit | F300-C12E/C11E | 2 | 1 | 2 | 1 |
| | MMI Unit | F300-FM2 | 9 | 1 | 7 | 1 |
| Camera I/F Units (see note) | Normal | F300-A20 | 3 to 6 | 4 total | 3 to 6 | 4 total |
| | Normal/Simultaneously | F300-A22S | | | | |
| | Shutter | F300-A20R | | | | |
| | Shutter/Simultaneously | F300-A22RS | | | | |
| | Frame Shutter | F300-A23RS | | | | |
| I/O Units | Terminal Block Unit | F300-D2 | 4 to 8 | 5 | 4 to 6 | 3 |
| | Parallel I/O Unit | F300-DC2 | | 2 | | 1 |
| | RS-232C I/F Unit | F300-E2 | | 1 | | 1 |
| Expansion Units | OVL Unit | F300-L12E | | 1 | | 1 |
| | Strobe I/F Unit | F300-FS | | 2 | | 2 |
| Dummy Unit | | F300-G | | 5 | | 3 |

**Important** Always use identical Camera I/F Units. Do not use different Camera I/F Unit models together.

## 3-3-2 Mounting Procedure

***1, 2, 3...***

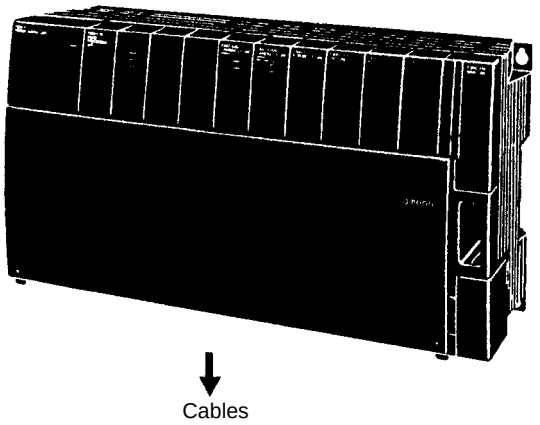
1. Turn off the power supply to the F300 System.
2. Align the claw on the top of the Unit with the recess in the Base Unit and correctly align the connectors.
3. Keeping the Unit and Base Unit parallel, push the Unit flush against the Base Unit.
4. Tighten the mounting screws at the top and bottom of the Unit with a Phillips screwdriver.




**Important** Be sure to turn off the power supply before mounting Units. Replacing or adding a Unit while the power is turned on will result in damage to the Unit.

## 3-3-3 Attaching the Cover

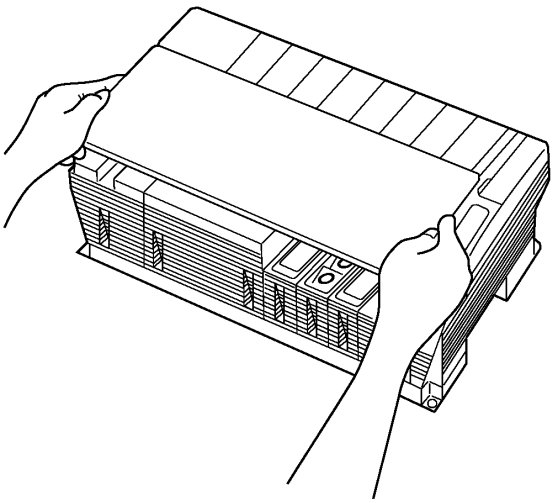
Attach the cover in order to protect connecting cables to Units and peripheral devices, and to guard against malfunctioning.
Do not force the cover into place, and do not place any heavy objects on top of the cover.




**Procedure**

***1, 2, 3...***

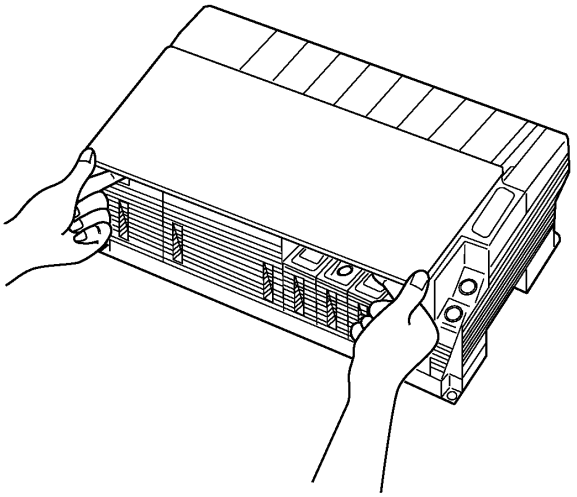
1. Holding the bottom of the cover, insert the catches on the top of the cover into the notches on the front surface of the Unit.
2. Press the bottom of the cover against the front surface of the Unit until it locks.



**Removing the Cover**

***1, 2, 3...***

1. Unlock the cover by lightly lifting up from the bottom.
2. Continue lifting the cover and remove the catches at the top of the cover from the notches in the Unit.



## 3-4 Power and Protective Conductor (Earth) Wiring

Connect power cables and ground cables to the Power Supply Unit terminal block. The terminal block uses M4 screw connectors. Use the crimped connectors shown in the table below.

**⚠ WARNING** In order to prevent electric shock, after completing the connection of the Power Supply Unit, be sure to cover the terminal block with the terminal protection cover (attachment) and fasten it using the plastic screw (attachment) and the screw hole of the NC terminal.

**Crimped Connectors**


**Recommended Wire Size** Use 2-mm$^2$ (14AWG) insulated wire for power supply wiring and protective conductor (earth) wiring.

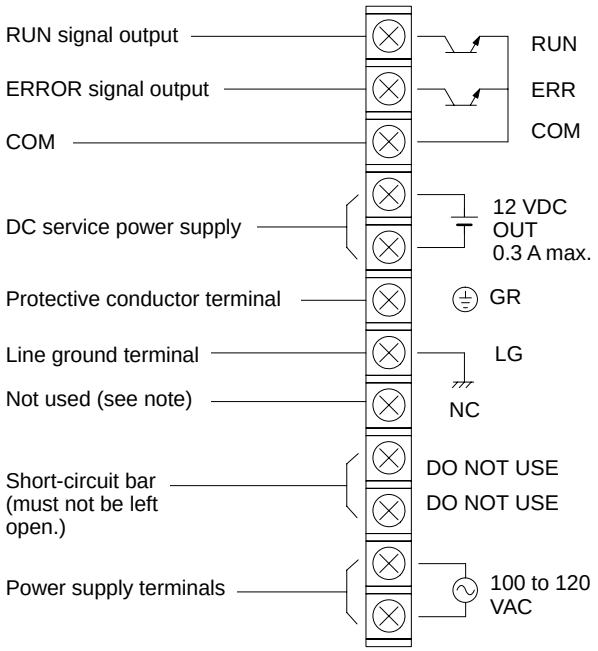
**Recommended Service Amperage** Connect the power supply terminals to a 15-A service amperage.

### 3-4-1 Power Wiring

**Important**

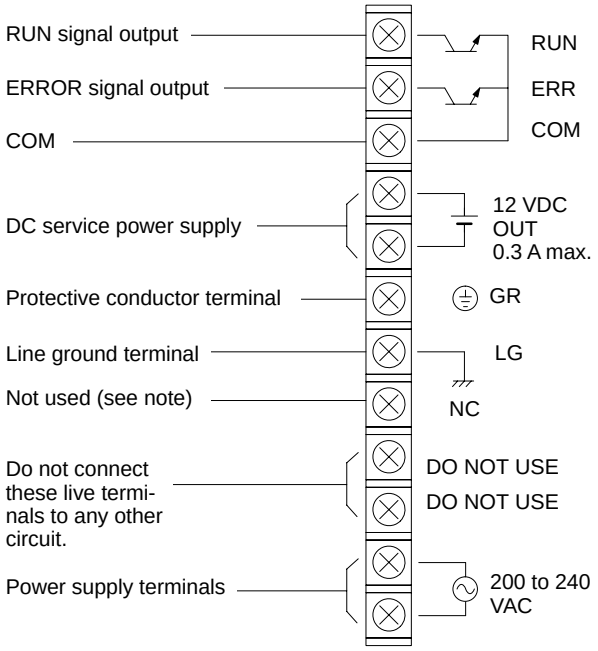
1. In order to avoid voltage drops, use power cables of at least 2 mm$^2$ (AWG14).
2. To avoid interference from inductive noise, use twisted-pair cable.
3. Wire the F300 power supply separately from other devices. In particular, wire it separately from any inductive loads.

## F300-P2 Power Supply Unit




**Note** The screw hole is for fastening the terminal protection cover (accessory).

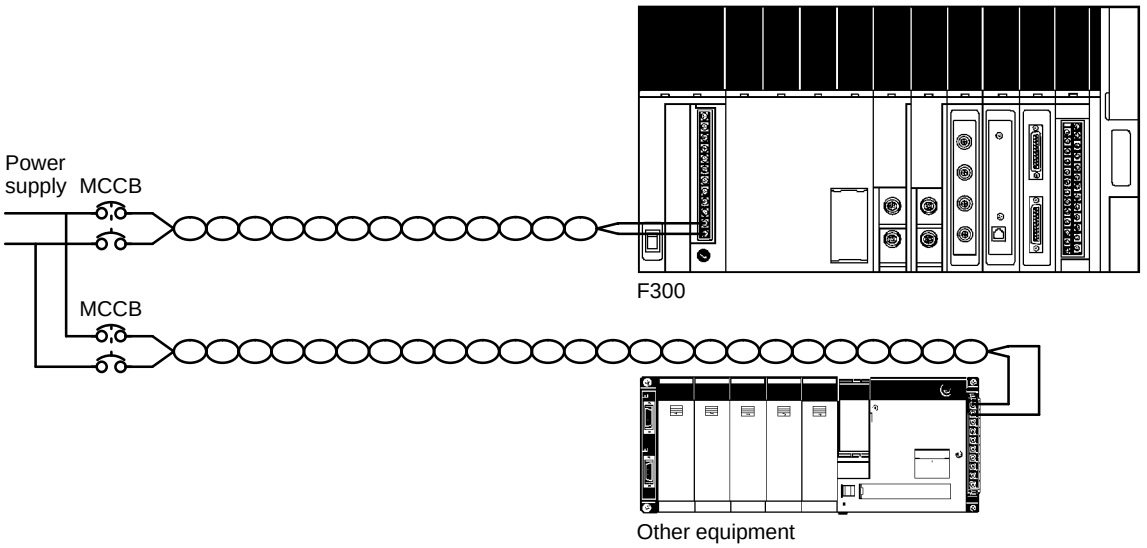
## F300-P2E Power Supply Unit




**Note** The screw hole is for fastening the terminal protection cover (accessory).

**Power Supply Capacity and Cable Sizing**

Although the current consumption should not exceed 2 A for 100 to 120 VAC/1 A for 200 to 240 VAC operation, surge current flows when the power is turned on. The power supply, protective circuit breakers, and cables must have sufficient capacity to prevent a voltage drop at startup.

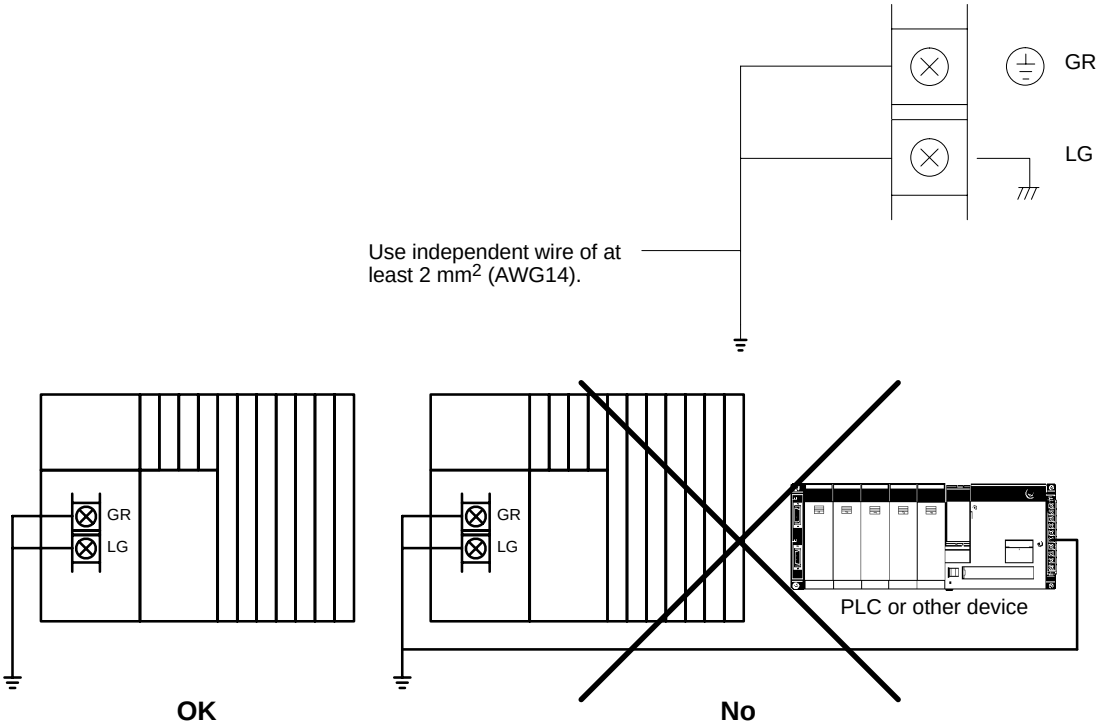



## 3-4-2 Protective Conductor (Earth) Wiring

**⚠ WARNING** In order to prevent electric shock, be sure to wire the protective conductor terminal to the protective earth using a conductor of at least 2 $mm^2$ (AWG14).

**Important** To avoid damage to the equipment due to lighting surge, short-circuit the GR and LG terminals using the short-circuiting bar (accessory).

To avoid damage to the equipment, do not share the protective conductor wiring with any other devices nor wire the protective conductor terminal to the metal frame. Be sure to wire the protective conductor wiring of the equipment independently.



# 3-5 System Setup

## 3-5-1 Connecting Power Supply Unit I/O Terminals

**⚠ WARNING** In order to prevent electric shock, after completing the connection of the Power Supply Unit, be sure to cover the terminal block with the terminal protection cover (attachment) and fasten it using the plastic screw (attachment) and the screw hole of the NC terminal.

For the power supply unit I/O wiring, use crimped connectors as shown below.

**Crimped Terminals**

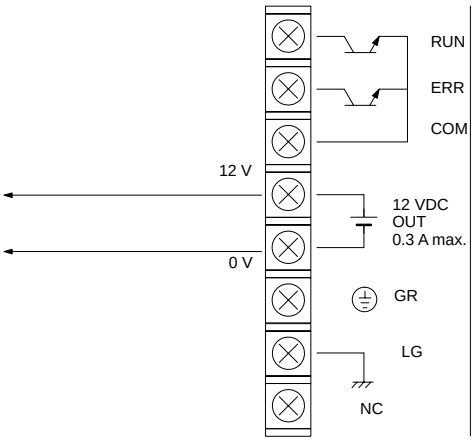

Applicable wire size: 1.04 to 2.63 $mm^2$ insulated wire.

**Connecting to External Power Supply**

The Power Supply Unit provides a 12-VDC service power supply. Use this power supply within the ranges specified below.

**Important** In the case of supplying the following terminals with an external power source, use a DC power supply with the safety extra-low voltage output.

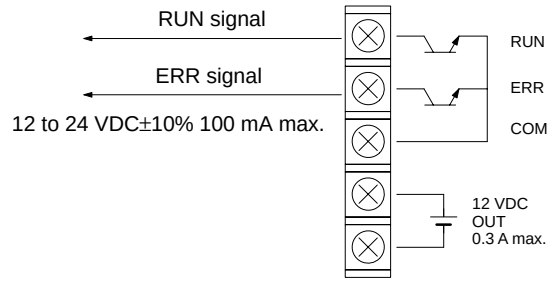
- COM IN terminals of Terminal Block Units or Parallel I/O Units
- COM OUT terminals of Terminal Block Units or Parallel I/O Units
- COM terminals of Power Supply Units




| | |
|---|---|
| **Output voltage** | 12 VDC ±5% |
| **Output current** | 0.3 A max. |

**Connecting to External Outputs**

The Power Supply Unit outputs RUN and ERROR signals.



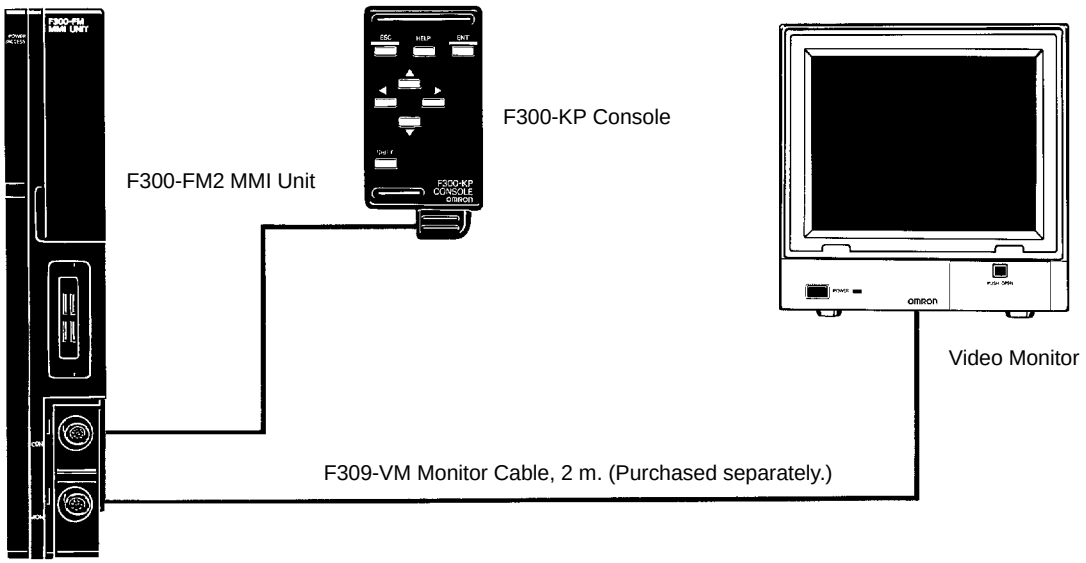

| Signal | Name | Description |
|---|---|---|
| **RUN** | RUN signal | ON during measurement |
| **ERR** | ERROR signal | ON when an error occurs |
| **COM** | Common | Common to RUN and ERR signals. |

The ERR signal is output on a camera error, missed strobe flash, measurement error, RS-232C I/F Unit communications error, Terminal Block Unit communications error, or memory card error. The error response can be set to enable or disable the ERR signal for various levels of errors.

## 3-5-2 Connecting Cables

Connect each Unit to external devices using the special-purpose cables (For example: F309-VM Monitor Cable). To prevent damage to the Units, turn off the power supply before connecting or disconnecting any cables.

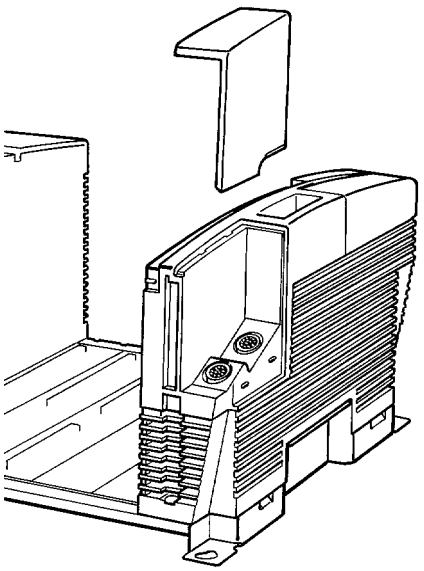
### MMI Unit




**Note** The F309-VM Monitor Cable incorporates a BNC connector, via which NTSC-standard video signals will be output to the Video Monitor.

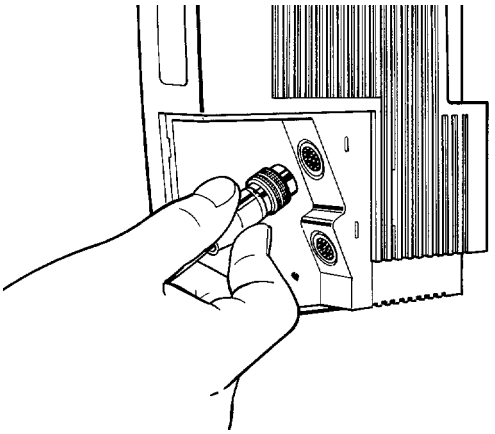
**Connecting and Disconnecting Cables**

Connect and disconnect Units using the following procedures.

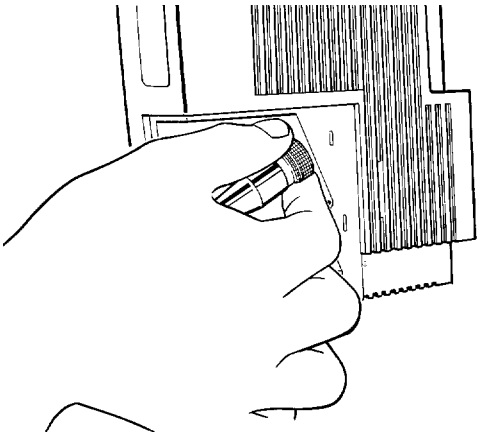


***1, 2, 3...*** 1. The Console and Video Monitor connectors are located under the MMI Unit connector cover.

2. To connect a cable, hold the rubber-molded part of the connector, align the notches, and push the connector straight in until it locks.

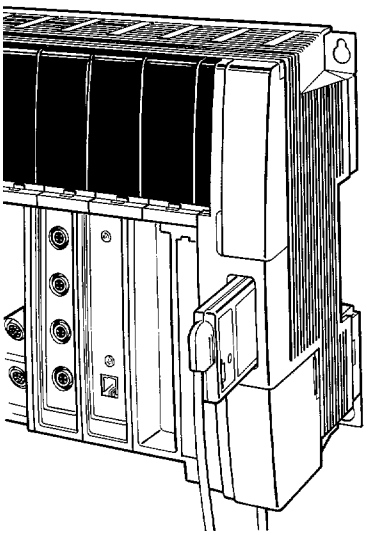


3. To disconnect the cable, lightly pull the lock ring to unlock the connector and pull the connector straight out. Do not apply undue force to the rubber molding or the cable.



**Storing the Console**

Store the Console in the recess provided in the MMI Unit when not in use. The magnet on the top of the Console holds it in place. Push the Console into the recess until it is held by the magnet.

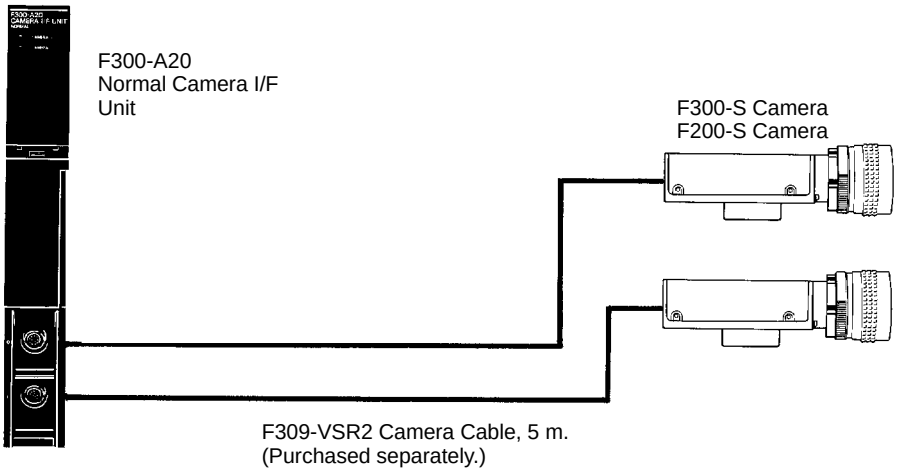


## Camera I/F Units

**Important** Observe the following precautions when connecting Cameras:

- Don't ground the camera case.
- Don't remove the insulating attachment of the Camera.
- Don't remove the ferrite core that is attached to the Camera Cable.

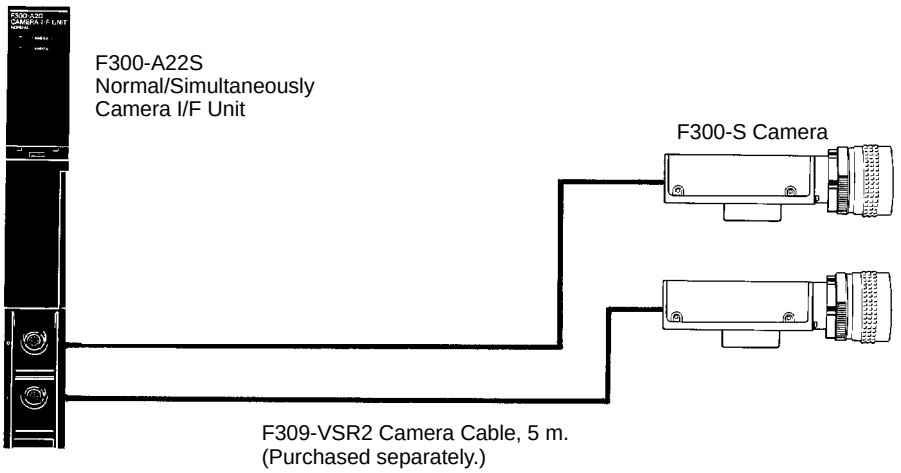
### Normal Camera I/F Units



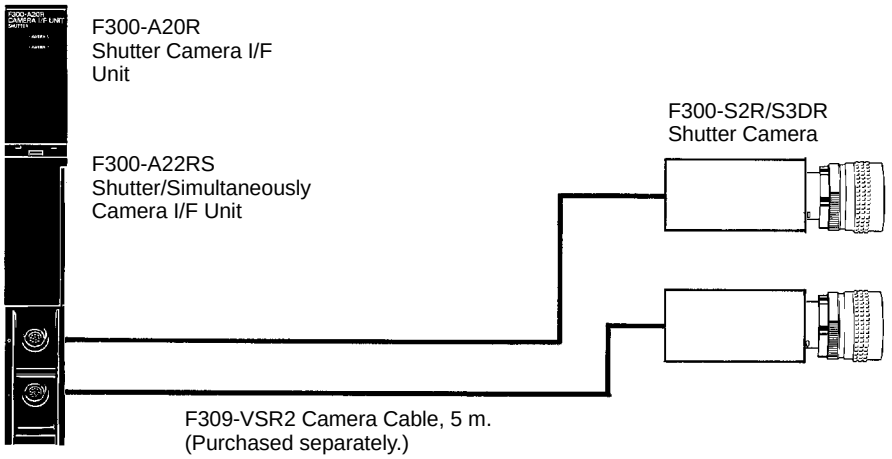

When using the F300-S Camera:

| | |
|---|---|
| AGC switch | OFF |
| SHT switch | OFF |

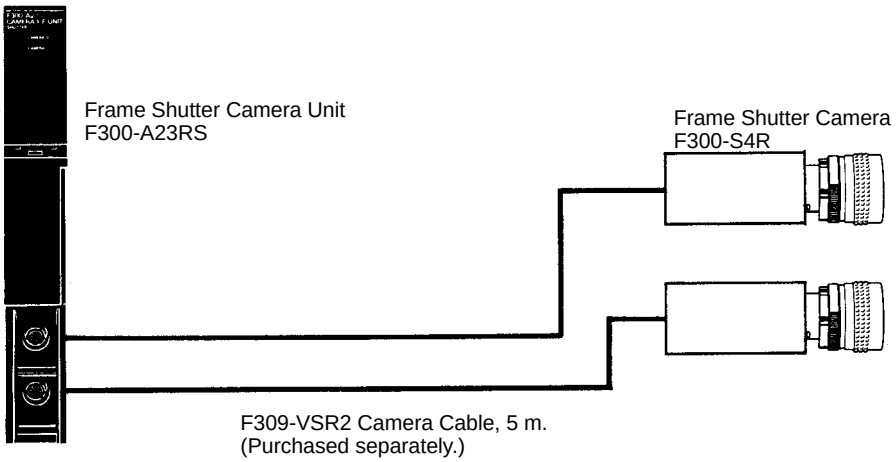
### Normal/Simultaneously Camera I/F Units



### Shutter and Shutter/Simultaneously Camera I/F Units




### Frame Shutter Camera I/F Unit



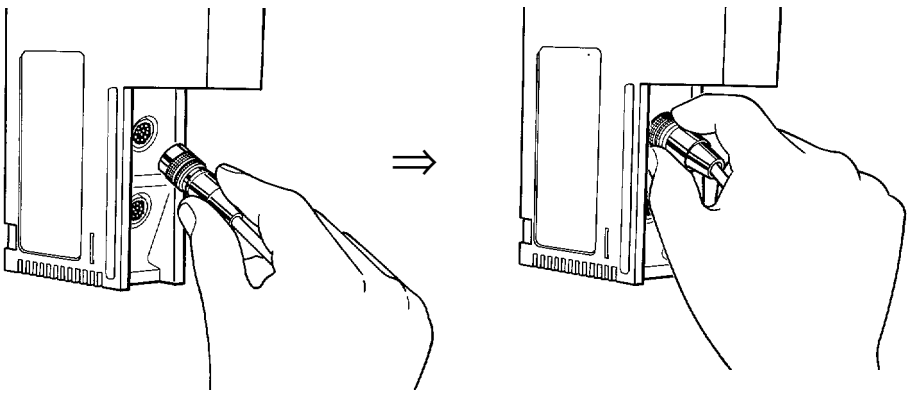

| | |
|---|---|
| SELECT switch | 1/30I |
| GAIN switch | OFF |

### Connecting and Disconnecting Cables

Use the following procedures to connect or disconnect a cable from the Unit.

***1, 2, 3...***

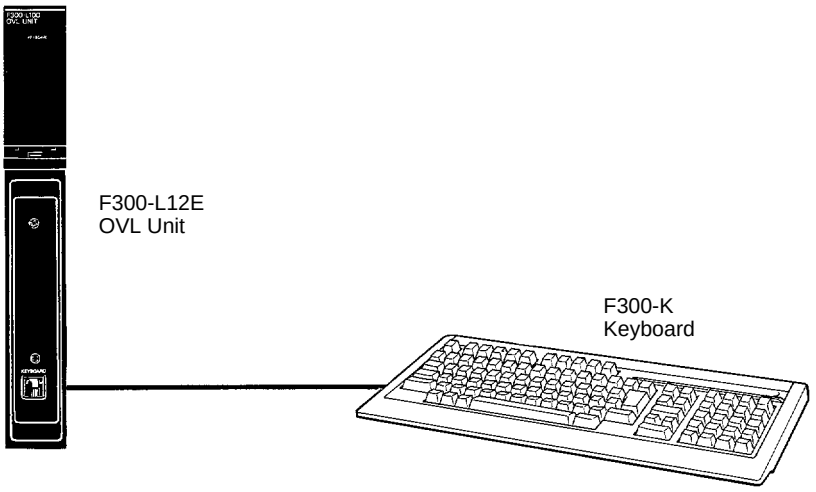
1. Hold the rubber-molded part of the connector, align the notches, and push the connector straight in until it locks.



2. Lightly pull the lock ring to unlock the connector and pull the connector straight out. Do not apply undue force to the rubber molding or the cable.

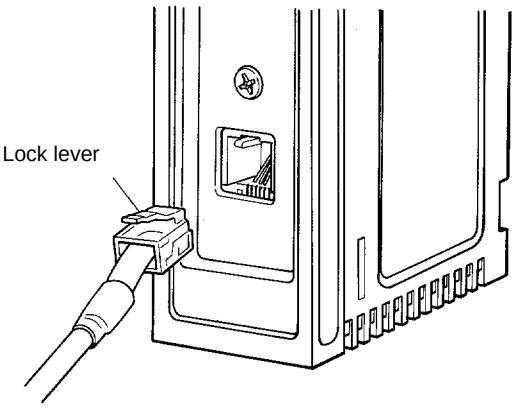
## OVL Unit

Follow the procedure below to connect and disconnect the F300-K Keyboard and the OVL Unit.

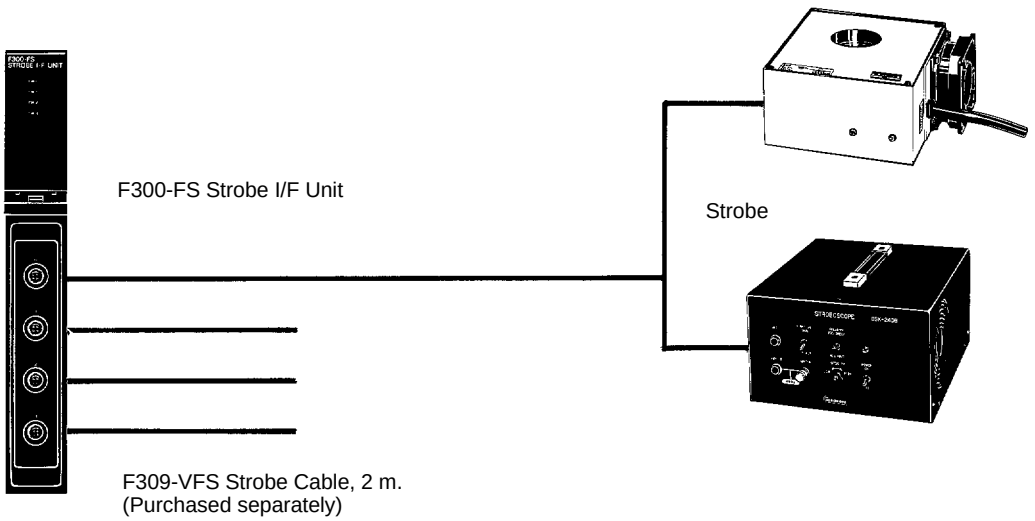



***1, 2, 3...***

1. Holding the connector with the lock lever pointing up, push the connector straight in until it locks.
2. Push down the lock lever to unlock the connector and pull the connector straight out.




## Strobe I/F Unit

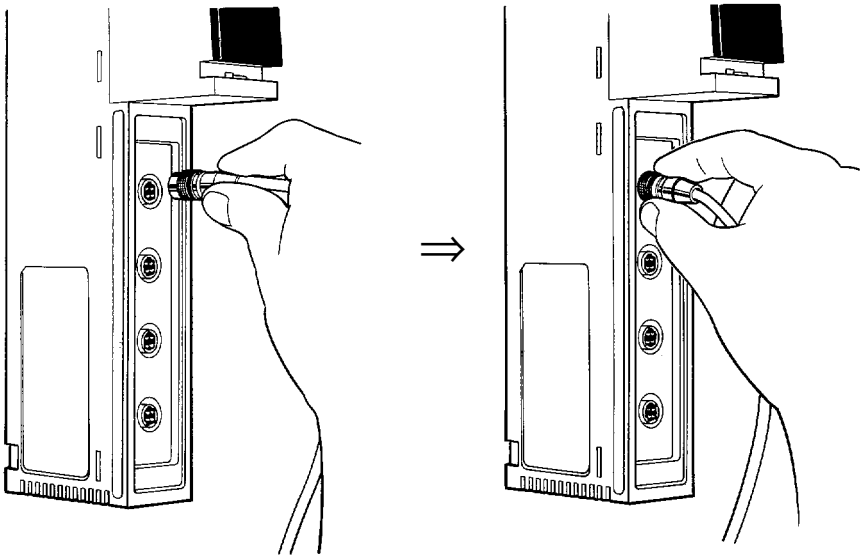


**Connecting and Disconnecting the F300-FS Strobe I/F Unit**

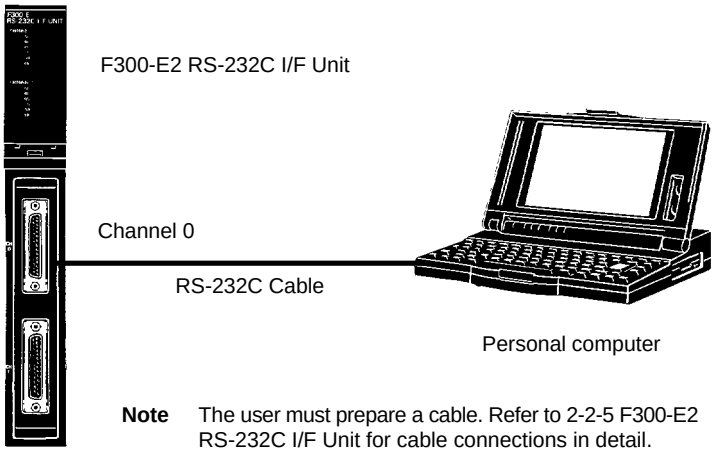
Use the following procedure to connect or disconnect the F300-FS Strobe I/F Unit and strobes.

***1, 2, 3...***

1. Hold the rubber-molded part of the connector, align the notches, and push the connector straight in until it locks.
2. Lightly pull the lock ring to unlock the connector and pull the connector straight out. Do not apply undue force to the rubber molding or the cable.



## RS-232C I/F Unit

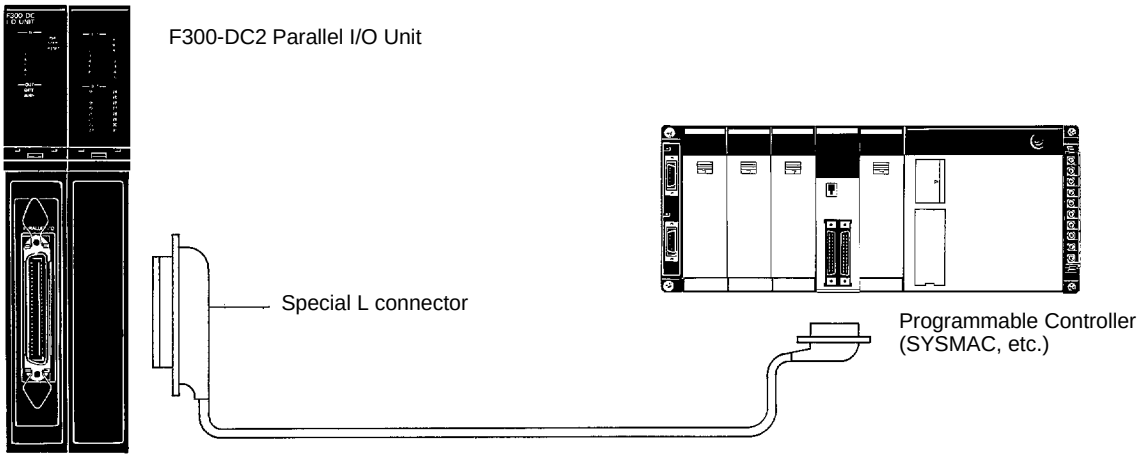



**Note** The user must prepare a cable. Refer to 2-2-5 F300-E2 RS-232C I/F Unit for cable connections in detail.

After inserting the connector, tighten the upper and lower screws.

## Parallel I/O Unit

A special L-connector is supplied for the Parallel I/O Unit. Refer to the *Connector Pin Allocation* diagram on page 34 when wiring and assembling this connector.




**Connector Specifications**

| Item | Model | Manufacturer |
|---|---|---|
| **Connector type** | 57LE-40500-7300 (D34) | Daiichi Denshi Kougyo |
| **Suitable connector (1 set provided)** | 57JE-B50H-L12 | |

**Note** Use the multi-conductor shielded cable for connecting the signal lines of Parallel I/O Units.

**Important** In the case of supplying the COM IN and COM OUT terminals with an external power source, use a DC power supply with the safety extra-low voltage output.

# SECTION 4
# Inspection, Maintenance, and Troubleshooting

This section explains how to inspect and maintain the F300 System and provides troubleshooting procedures to follow should problems occur.


4-1 Inspection . . . . . 62
4-2 Maintenance . . . . . 62
4-2-1 Memory Back-up Battery for IMP Unit Replacement . . . . . 62
4-2-2 Replacing the Fuse . . . . . 64
4-2-3 Memory Card Battery Replacement . . . . . 64
4-3 Troubleshooting . . . . . 65

# 4-1 Inspection

Inspect the F300 System on a daily or regular basis to maintain it in proper working condition.

## Regular Inspections

The majority of components used in the F300 System are semiconductors, which under proper operational conditions require little or no maintenance. Regular inspections are important, however, to prevent problems such as terminal deterioration due to environmental factors.

**Inspection Points**

Inspections are normally carried out once or twice a year. Increase this frequency to suit the surrounding environmental conditions.

| Inspection point | Details | Standard | Comments |
|---|---|---|---|
| Power supply | Voltage measured at terminal block within standard value? | Within rated voltage range (see Note 1) | Circuit tester |
| Environment | Ambient temperature inside cabinet within standard value? | 0°C to 50°C | Thermometer |
| | Ambient humidity inside cabinet within standard value? | 35% to 85% | Hygrometer |
| | Condensation within acceptable range? | No condensation | --- |
| | No accumulated dust, soil, etc? | No accumulation | Visual inspection |
| Installation | Units firmly fixed? | No looseness | Flat-blade screwdriver |
| | Cable connectors correctly inserted and locked? | No looseness | --- |
| Battery life | Memory back-up battery within rated life period? | Within 5 years (see Note 2) | --- |

**Note** 1. Permitted voltage fluctuation ranges

| Power Supply Unit | Fluctuation range |
|---|---|
| F300-P2 | 100 to 120 VAC |
| F300-P2E | 200 to 240 VAC |

2. Battery Life
A lithium battery is built into the IMP Unit to backup the memory. The battery life is approximately 5 years at a temperature of 25°C. The life is reduced at higher and lower temperatures. Replace the battery before the end of the current battery's rated life.

# 4-2 Maintenance

The F300 IMP Unit back-up battery and Power Supply Unit fuse and memory card back-up battery require periodic replacement. Follow the procedures below to replace these items.

Except for the user-serviceable parts above, the user should return the F300 to OMRON for all repairs and servicing.

## 4-2-1 Memory Back-up Battery for IMP Unit Replacement

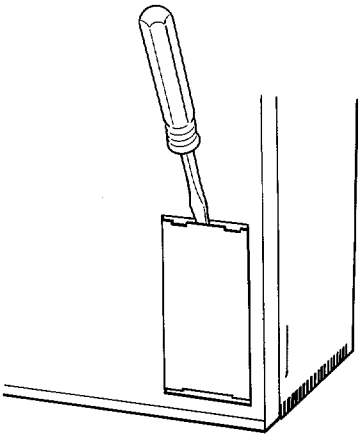
**Recommended Parts**

| Model number | Maker |
|---|---|
| 3Z49-BAT1 | OMRON |

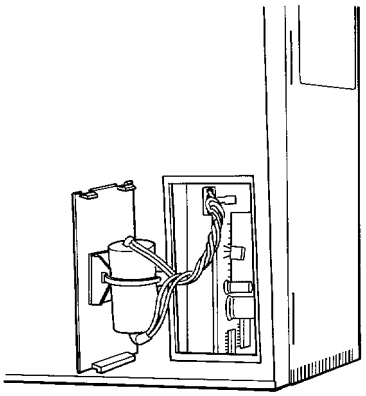
**Procedure**

***1, 2, 3...***

1. Turn off the F300 System power. If the F300 System is already off, turn it on for 10 seconds then turn it off again.
2. Insert a small flat-blade screwdriver into the cut-out at the top of the battery cover and gently remove the cover.



3. Detach the battery connector. Cut the battery retaining band with nippers and pull the battery from the connector.
4. Secure the new battery to the cover with the retaining band supplied and attach the battery connector.



5. Return the battery cover to its original position.

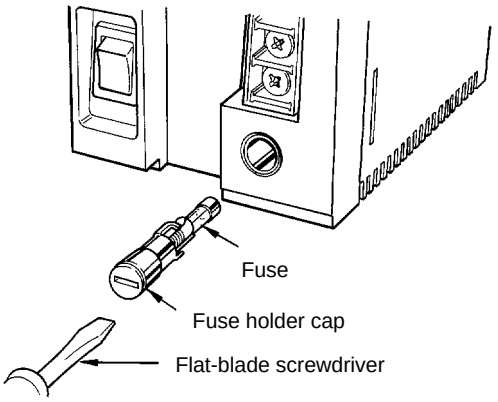
**Important**

1. Replace the battery within 5 minutes to prevent loss of the memory contents. If replacement will take more than 5 minutes, transfer the scene, system, and shading master data to a memory card or a computer connected to the RS-232C port before replacing the battery.
2. To prevent damage to or leakage from the battery, do not short, recharge, disassemble, or heat the battery.

## 4-2-2 Replacing the Fuse

***1, 2, 3...***

1. Disconnect the power supply before replacing the fuse.
2. Loosen and remove the fuse holder cap with a flat-blade screwdriver. Pull out the cap and remove the fuse located inside.




3. Insert a new fuse and replace the cap in its original position.

**Fuse Specifications**

| Power Supply Unit | Specifications |
|---|---|
| F300-P2 | 6.3 A, 125 V, MF51NM<br>• UL and CSA approved.<br>• Semi time-lag type. |
| F300-P2E | T3.15 A, 250 V, 5.2 dia. x 20 mm<br>• UL and CSA approved.<br>• According to IEC127 sheet III. |

## 4-2-3 Memory Card Battery Replacement

The following table shows the recommended batteries for each type of memory card.

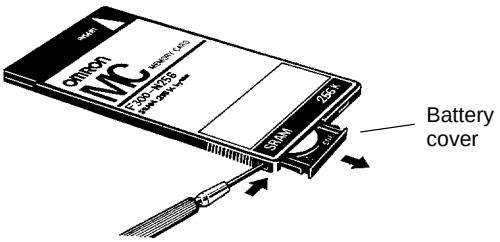
| Memory card | Battery |
|---|---|
| N300-N256 | • HMC-BAT01 (OMRON)<br>• CR2325 |
| F300-N512 | |
| F300-N2M | CR2025 |

**F300-N256/N512**

Follow the procedure shown below to replace the battery for an F300-N256 or F300-N512 Memory Card.

***1, 2, 3...***

1. Using a pointed implement such as a pin, push down the battery cover from the hole in the right side.




2. Replace the battery, being careful to insert the new battery in the proper direction. To avoid memory loss, be sure to replace the battery within one minute.
3. Put the battery cover back in position.

**F300-N2M**

Follow the procedure shown below to replace the battery for an F300-N2M Memory Card.

***1, 2, 3...***

1. Press down the catches and pull out the battery cover.
2. Replace the battery, being careful to insert the new battery in the proper direction. To avoid memory loss, be sure to replace the battery within five minutes.
3. Put the battery cover back in position.

**⚠ WARNING** Do not short-circuit plus and minus battery terminals, attempt to charge batteries, take them apart, deform them, or dispose of them in a fire. Batteries can explode, leak, or combust.

# 4-3 Troubleshooting

**Troubleshooting Table**

| Symptom | Cause | Remedy |
|---|---|---|
| POWER indicator does not light | Broken power cable; circuit breaker tripped; loose terminal | Replace fuse. |
| | Blown fuse | Set correctly. |
| | Incorrect setting of voltage selector bar | Set bar correctly. |
| RUN indicator does not light | Measurement conditions not set | Correctly set measurement conditions. |
| ERROR indicator does not light | Defective IMP Unit | Contact Service Center |
| No image on screen | Incorrect connection of camera or video monitor | Check connector contact and cable conductivity. |
| | Incorrect camera number setting | Correctly set camera number. |
| No input from Console or keyboard | Defective connector contact; broken cable | Check connector contact and cable conductivity. |

# Appendix A
## Comparison of New and Old Models

## Modified Units

The Units shown in the following table have been modified to conform to the EC Directives.

| Unit name | New model number | Old model number |
|---|---|---|
| IMP Unit | F300-C12E | F300-C10EV2 |
| Power Supply Unit | F300-P2 (100 to 120 VAC) (see note) | F300-P |
| | F300-P2E (200 to 240 VAC) | F300-PE |
| MMI Unit | F300-FM2 | F300-FM |
| Base Unit | F300-B52 | F300-B5 |
| | F300-B32 | F300-B3 |
| Normal Simultaneously Camera I/F Unit | F300-A22S | F300-A20S |
| Shutter Simultaneously Camera I/F Unit | F300-A22RS | F300-A20RS |
| Parallel I/O Unit | F300-DC2 | F300-DC |
| Terminal Block Unit | F300-D2 | F300-D |
| RS-232C I/F Unit | F300-E2 | F300-E |
| OVL Unit | F300-L12E | F300-L100EV2 |
| Camera Cable | F309-VSR2 | F309-VS |
| | F309-VSR2 | F309-VSR |

**Note** The model has been changed but does not conform to the EC Directives.

## Conformance to EC Directives

Use only the following Units when installing a Visual Inspection System that must conform to the EC Directives.

| Unit name | Model number |
|---|---|
| IMP Unit | F300-C12E |
| Power Supply Unit | F300-P2E |
| MMI Unit | F300-FM2 |
| Base Unit | F300-B52 |
| | F300-B32 |
| Normal Simultaneously Camera I/F Unit | F300-A22S |
| Shutter Simultaneously Camera I/F Unit | F300-A22RS |
| Parallel I/O Unit | F300-DC2 |
| Terminal Block Unit | F300-D2 |
| RS-232C I/F Unit | F300-E2 |
| OVL Unit | F300-L12E |
| Dummy Unit | F300-G |
| Console | F300-KP |
| Normal Camera | F300-S |
| Shutter Camera | F300-S2R |
| Memory Card | F300-N256 |
| | F300-N512 |
| | F300-N2M |
| Keyboard | F300-K |
| Monitor Cable | F309-VM (2 m) |
| Camera Cable | F309-VSR2 (5 m) |
| RS-232C Cable | F309-VR (5 m) |

# Non-conformance to EC Directives

| Unit name | Model number |
|---|---|
| Power Supply Unit | F300-P2 (100 to 120 VAC) |
| Normal Camera I/F Unit | F300-A20 |
| Shutter Camera I/F Unit | F300-A20R |
| Frame Shutter Camera I/F Unit | F300-A23RS |
| Strobe I/F Unit | F300-FS |
| Video Monitor | F300-M09 (100 VAC) |
| Normal Camera | F200-S |
| Shutter Camera | F300-S3DR |
| Frame Shutter Camera | F300-S4R |
| Strobe Cable | F309-VFS (2 m) |

# Interface Compatibility

Some old IMP Units cannot be connected to some new Base Units as shown in the following table.

| Base Unit | IMP Unit | |
|---|---|---|
| | **F350-C10□**<br>**F350-C40□** | **F350-C12□**<br>**F350-C41□** |
| F300-B3/B5 | Connectable | Connectable |
| F300–B32/B52 | Not connectable | Connectable |

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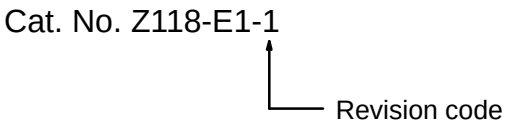
# Revision History

A manual revision code appears as a suffix to the catalog number on the front cover of the manual.




The following table outlines the changes made to the manual during each revision. Page numbers refer to the previous version.

| Revision code | Date | Revised content |
|---|---|---|
| 1 | April 1997 | Original production |