

# CP 150 12-lead resting electrocardiograph

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## Quick reference guide

Software version 2.10.XX

**WelchAllyn**<sup>®</sup>

Advancing Frontline Care<sup>™</sup>

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# 106580 (CD)  
DIR 80020981 Ver. A

This manual applies to the REF 901049 ELECTROCARDIOGRAPH



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Revision date: 2016-04

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# Setup

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## Powering the electrocardiograph

The electrocardiograph runs on AC or battery power. Plug the electrocardiograph into AC power as often as possible so that the built-in charger can keep the battery charged. Regardless of the battery condition, you can use the electrocardiograph whenever it is plugged in.



**WARNING** When you use AC power, always plug the electrocardiograph into a hospital-grade outlet to avoid the risk of shock.

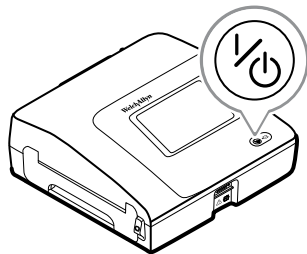


**WARNING** If the integrity of the building's safety ground is in doubt, operate this device on battery power to avoid the risk of shock.

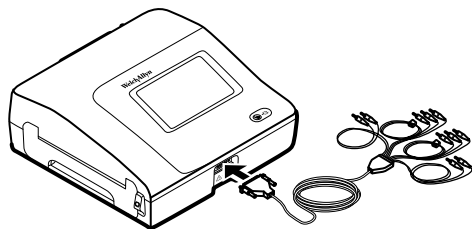
### To turn on or turn off



Press



## Connecting the patient cable





**WARNING** Do not allow the conductive parts of the patient cable, electrodes, or associated connections of defibrillation-proof applied parts, including the neutral conductor of the patient cable and electrodes, to come into contact with other conductive parts, including earth ground. Otherwise, an electrical short might result, risking electric shock to patients and damage to the device.



**WARNING** To avoid injury to the patient or damage to the device, never plug patient leads into any other device or wall outlet.



**WARNING** To provide CF protection use only accessories approved by Welch Allyn. Visit [www.welchallyn.com](http://www.welchallyn.com). The use of any other accessories can result in inaccurate patient data, can damage the equipment, and can void your product warranty.

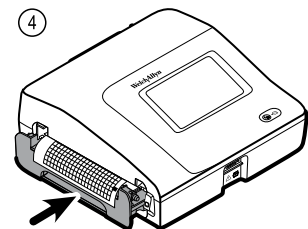
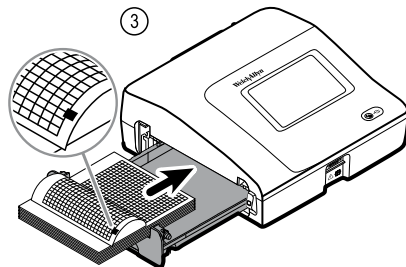
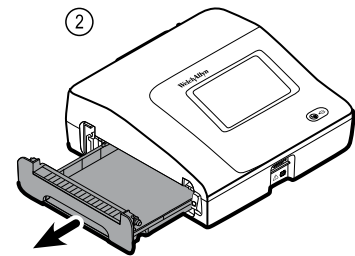
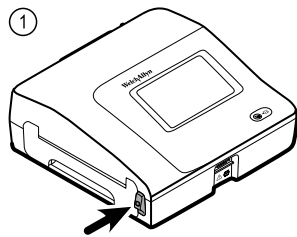


**CAUTION** Always connect the patient cable and the leads properly during defibrillation. Otherwise, the connected leads could be damaged.

## Loading the thermal paper

The electrocardiograph prints on z-fold thermal paper.

- Store the paper in a cool, dry, dark place.
- Do not expose it to bright light or UV sources.
- Do not expose it to solvents, adhesives, or cleaning fluids.
- Do not store it with vinyls, plastics, or shrink wraps.



## Attach the leads to the patient

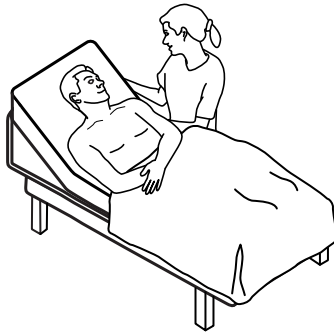
Proper lead attachment is important for a successful ECG. The most common ECG problems are caused by poor electrode contact and loose leads. Follow your local procedures for attaching the leads to the patient. Here are some common guidelines.



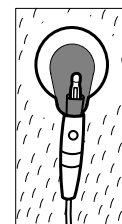
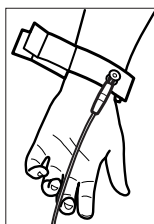
**WARNING** Electrodes can cause allergic reactions. To avoid this, follow the electrode manufacturer's directions.

### To attach the leads to the patient

1. Prepare the patient.
  - Describe the procedure. Explain the importance of holding still during the test. (Movement can create artifact.)
  - Verify that the patient is comfortable, warm, and relaxed. (Shivering can create artifact.)
  - Put the patient in a reclining position with the head slightly higher than the heart and legs (the semi-Fowler's position).



2. Select the electrode locations. (See the "Electrode locations" chart.)
  - Look for flat areas.
  - Avoid fatty areas, bony areas, and major muscles.
3. Prepare the electrode locations.
  - Shave or clip the hair.
  - Thoroughly clean the skin, and lightly rub it dry. You may use soap and water, isopropyl alcohol, or skin preparation pads.
4. Attach the lead wires to the electrodes.
5. Apply the electrodes to the patient.



Electrode examples, left to right: arm clamp (reusable), Welsh cup (reusable), tab electrode (disposable), monitoring electrode (disposable).

- **For reusable electrodes:** Use electrode paste, gel, or cream to cover an area the size of each electrode but no larger. Secure the arm and leg clamps. Apply the Welsh cups (suction electrodes) to the chest.
- **For disposable tab electrodes:** Place the electrode tab between the "jaws" of the connector. Keep the tab flat. Verify that the metal portion of the connector makes contact with the skin side of the electrode tab.

- **For all disposable electrodes:** Lightly tug on the connector to ensure that the lead is securely attached. If the electrode comes off, replace it with a new electrode. If the connector comes off, reconnect it.

## Secure the AC power cord around the cord wrap of the mobile stand

**Note** To avoid stress on the AC power connection, loop the power cord around the mobile stand cord wrap.



**WARNING** When you use AC power, always plug the electrocardiograph into a hospital-grade outlet to avoid the risk of shock.

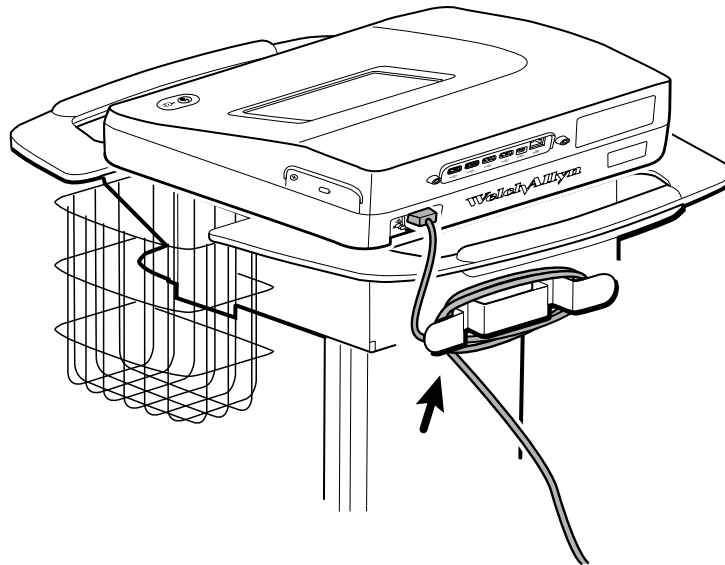


**WARNING** When transporting the electrocardiograph on a cart, tuck the patient cable away to keep them clear of the wheels and to minimize trip hazards.



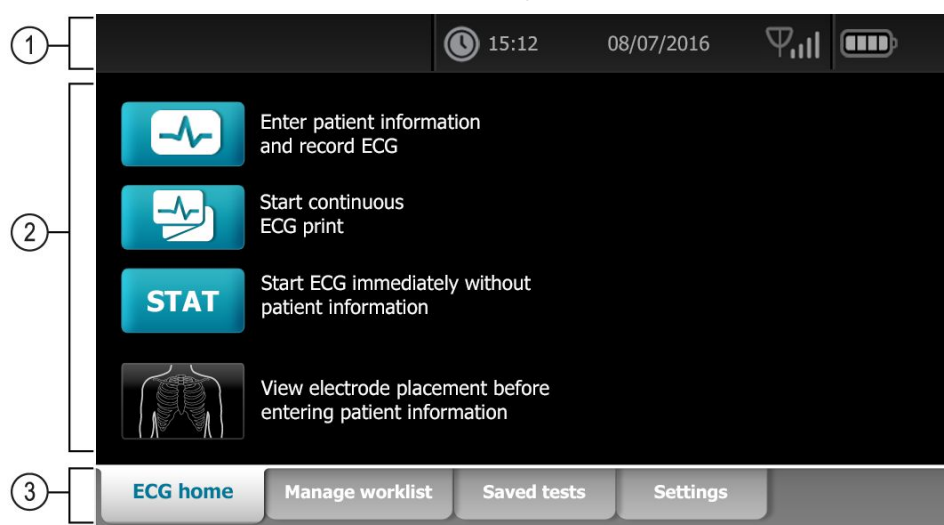
**WARNING** Avoid positioning any leads or cables so that they could easily trip someone or become wrapped around a patient's neck.

Welch Allyn recommends looping the power cord around the mobile stand cord wrap as shown.



## ECG home screen

The ECG home screen includes the following areas:



Item	Area
1	Device status
2	Content
3	Navigation

### Device status area

The Device status area, located at the top of the ECG home screen, displays:

- Patient Icon and Patient name. Once the patient context is established, the format of the Patient name appears as last name, first name.
- Time and date
- Connectivity status. The icons indicate which connection type, if any, is currently active.
- Battery status
- Error or information messages. These items are displayed until the condition has been resolved.

## Content area

The Content area includes 3 test selection buttons and a preview selection button:

- **Auto ECG**
- **Rhythm ECG**
- **Stat ECG**
- **Electrode Placement (ECG preview)**

The content area also provides shortcuts to several controls.

## About the test types

### Auto ECG



A report typically showing a 10-second acquisition of 12 leads of ECG information combined with patient data, measurements, and optional interpretation.

### Rhythm ECG



A continuous, real-time printout of rhythm strips with a user-defined lead configuration. Rhythm ECGs are printouts only. They cannot be saved.

### Stat ECG



An auto ECG that starts without waiting for you to enter patient data. Patient data does not appear.



**WARNING** To avoid the risk of associating reports with the wrong patients, make sure that each test identifies the patient. Do not save a test to the patient record without patient identification associated with the report.

## Navigation area

The Navigation area includes the following tabs:

- **ECG home:** Displays ECG test types and provides shortcuts to several controls.
- **Manage worklist :** Includes patient data and orders downloaded when connected to a hospital information system (Worklist server).
- **Saved tests:** Accesses the patient ECG tests.
- **Settings:** Accesses device configuration settings.

To navigate to a tab, touch the tab in the Navigation area with the corresponding name. The active tab is highlighted.



# ECG tests

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## Use the New Patient tab to perform an Auto ECG test



**CAUTION** Patient data is not saved until the ECG test is completed.

**Note** The ECG configuration settings can be changed in the Settings tab. The following settings may appear differently if the default settings have been modified.

**Note** Set the Default patient entry tab to *New patient* in the Advanced settings.

1. Touch  (Auto ECG). The New patient tab appears.

**Note** In a connected environment, with the Default patient entry tab set to *Worklist* (in the Advanced settings), the worklist is downloaded from the Worklist server workstation and the Worklist tab appears. Touch the **New patient** tab to proceed with the New patient workflow.

2. Enter the following patient information as desired:

- Patient ID. Touch **OK**.
- Birth date. Touch **OK**.
- Gender. Touch **OK**.
- Last name. Touch **OK**.
- First name. Touch **OK**.
- Middle Initial. Touch **OK**.

**Note** If the patient has a pacemaker touch *Pacemaker present*.

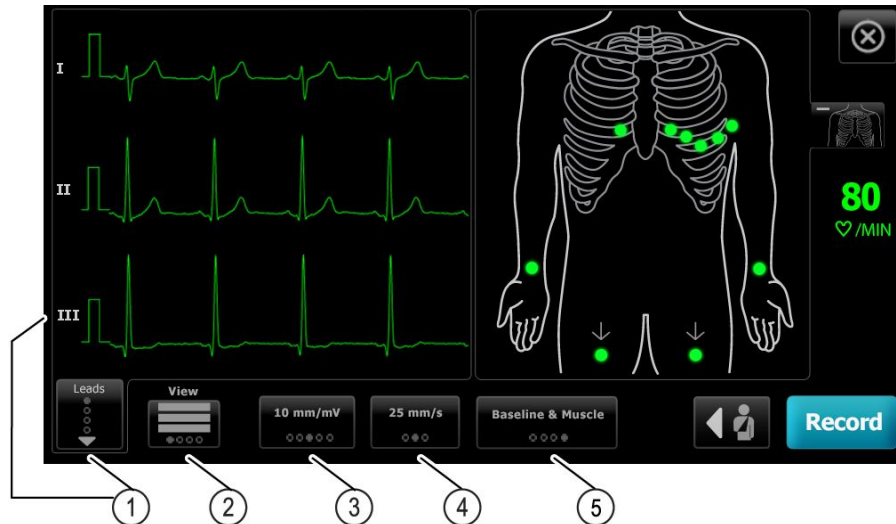
3. Touch  (Next).

4. Enter the following patient information as desired:

- Race
- Height. Touch **OK**.
- Weight. Touch **OK**.
- Physician. Touch **OK**.
- Comments. Touch **OK**.


5. Attach the leads to the patient.

6. (Optional) Adjust the waveforms, using the buttons to cycle through the following options:
- leads displayed
  - ECG preview format
  - gain (size)
  - speed
  - filters



Item	Button
1	Leads button
2	ECG preview button
3	Gain button (size)
4	Speed button
5	Filters button

**Note**

If desired, touch  (torso button) to enlarge the electrode placement (ECG preview) screen. Any flashing dots on the screen indicate unattached or poorly attached leads.

7. If an *Artifact* message appears, minimize the artifact, as described under Troubleshooting. You might need to ensure that the patient is comfortably warm, reprepare the patient's skin, use fresh electrodes, or minimize patient motion.

8. Touch **Record** to perform the Auto ECG test.

When the *Print preview* screen appears, touch **Next** to continue with the Auto ECG test or touch **Retest** to return to the previous screen.

9. If a *Waiting for 10 seconds of quality data* message appears, at least 10 seconds of ECG data have been collected with excessive artifact. Time requirements in the message may vary, based upon selected print format. Minimize the artifact, as

described under Troubleshooting. Then wait for the test to record. If necessary, you can override the wait time and record the available data immediately, but the result might be an incomplete or poor-quality test.

10. After the test is completed, select the desired option: **Print**, **Save**, or **Rhythm**. If the *Auto Save* setting is turned off, touch **Save** to save the test. Select one of the following locations:
  - Local (internal memory)
  - USB mass storage device (Any tests that you save to a USB mass storage device can be retrieved only from a CardioPerfect workstation.)
  - Workstation (includes DICOM image server)
  - Remote file location
11. Touch **Print** to print the test, touch **Rhythm** to start a continuous-print ECG, or touch **Exit**.



**WARNING** To avoid the risk of associating reports with the wrong patients, make sure that each test identifies the patient. Do not save a test to the patient record without patient identification associated with the report.

## Use the Worklist tab to perform an Auto ECG test when connected to the Worklist server





**CAUTION** Patient data is not saved until the ECG test is completed.

- Note** The ECG configuration settings can be changed in the Settings tab. The following settings may appear differently if the default settings have been modified.
- Note** Connect the electrocardiograph to the same network as the DICOM Image server workstation and Worklist server by WiFi or Ethernet cable. If you need help, consult your network administrator.
- Note** Set the default patient entry tab to *Worklist* in the Advanced settings.

1. Touch  (Auto ECG).

The worklist is downloaded and the Worklist tab appears.

**Note** If the patient that you are searching for is not listed in the downloaded worklist, exit the worklist and touch  (Auto ECG) to refresh the worklist and to determine if a new order is awaiting processing from the server.

2. Touch within the Patient row to select the patient from the Worklist.  
If the patient has a pacemaker touch *Pacemaker present*.
3. Touch **Select** to start a test immediately, or touch **Review** to review or edit patient information. (Optional) Touch  (Next) again.
4. Touch **Record** to perform the Auto ECG test.
5. When the *Print preview* screen appears, touch **Next** to record the test or touch **Retest** to start the test over.
6. After the test is complete, select the desired option: **Print**, **Save**, or **Rhythm**.

If you are prompted to save the Auto ECG test, select Workstation. To save to another location, touch Local, USB mass storage device, or Remote file location and touch **Save**.


7. Touch **Exit** to return to the ECG home screen, or touch **Print** to print the ECG test, or touch **Rhythm** to perform a continuous-print ECG.

## Perform an Auto ECG test using the Search tab



**CAUTION** Patient data is not saved until the ECG test is completed.


**Note** The ECG configuration settings can be changed in the Settings tab. The following settings may appear differently if the default settings have been modified.

1. Touch  (Auto ECG). The New patient tab appears.
2. Search for patient.

The Search tab gives you access to patient data in the Saved tests directory or in a connected database (CardioPerfect workstation or EMR).




- Touch the **Search** tab.
- Enter the Patient ID or Last name.
- Touch **OK**.
- Touch **Search**.
- Touch within the patient row.

**Note** If the patient has a pacemaker touch *Pacemaker present*.

- Touch **Select** to start a test immediately.
  - Touch **Review** to review or edit patient information.
  - (Optional) Touch  (Next) again.
3. Attach the leads to the patient.
  4. Touch **Record** to perform the Auto ECG test.
  5. After the test is complete, select the desired option: **Print**, **Save**, or **Rhythm**.

If you are prompted to save the Auto ECG test, select Local, USB mass storage device, Workstation, or Remote file location. Touch **Save**.

## Perform a Rhythm ECG test after an Auto ECG test

1. Touch  (Auto ECG).
2. Enter the patient information.
  - Touch  (Next) to review or edit patient information.
  - (Optional) Touch  (Next) again.
3. Attach the leads to the patient.
4. Touch **Record** to perform the Auto ECG test.
5. After the test completes, touch **Rhythm**.

If you are prompted to save the Auto ECG test, select Local, USB mass storage device, Workstation, or Remote file location. Touch **Save**.

6. Touch **Start** to begin the Rhythm ECG test.  
Touch **Stop** once the desired length of real-time rhythm strips have printed.

## Assign an Auto ECG test to the worklist




You can assign an Auto ECG test to the worklist if patient demographic fields are left blank.



**CAUTION** Patient data is not saved until the ECG test is completed.

**Note** If an Auto ECG test is performed without entering complete patient demographics, this test can be assigned to a patient in the worklist after the test is completed.

**Note** To use the assign feature the *Test assignment on* setting has to be turned on.

1. Touch  (Auto ECG). The New patient tab appears.
2. Touch  (Next).
3. (Optional) Touch  (Next).
4. Attach the leads to the patient.
5. Touch **Record** to perform the Auto ECG test.
6. When the *Print Preview* screen appears, touch **Next** to continue with the Auto ECG test or touch **Retest** to discard the test and return to the previous screen.
7. After the test completes, touch **Assign**.
8. Touch within the Patient row.
9. Touch **Select**.

If you are prompted to save the Auto ECG test, select Local, USB mass storage device, Workstation, or Remote file location. Touch **Save**.



**WARNING** To avoid the risk of associating reports with the wrong patients, make sure that each test identifies the patient. If any report does not identify the patient, write the patient identification information on the report immediately following the ECG test.

10. Touch **Print** to print the test, touch **Retest** to discard the test and start over, touch **Rhythm** to start a continuous-print ECG , or touch **Exit**.



# Troubleshooting

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## Lead-quality problems

### “Artifact” message on the screen

Artifact is signal distortion that makes it difficult to accurately discern the waveform morphology.

#### Causes

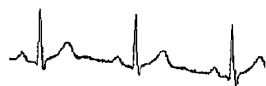
- The patient was moving.
- The patient was shivering.
- There is electrical interference.

#### Actions

See actions for wandering baseline, muscle tremor, and AC interference.

### Wandering baseline

Wandering baseline is an upward and downward fluctuation of the waveforms.



#### Causes

- Electrodes are dirty, corroded, loose, or positioned on bony areas.
- The electrode gel is insufficient or dried.
- The patient has oily skin or used body lotions.
- Rising and falling of chest during rapid or apprehensive breathing.

#### Actions

- Clean the patient's skin with alcohol or acetone.
- Reposition or replace the electrodes.
- Verify that the patient is comfortable, warm, and relaxed.
- If wandering baseline persists, turn the baseline filter on.

## Muscle tremor



### Causes

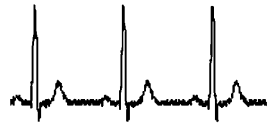
- The patient is uncomfortable, tense, nervous.
- The patient is cold and shivering.
- The exam bed is too narrow or short to comfortably support arms and legs.
- The arm or leg electrode straps are too tight.

### Actions

- Verify that the patient is comfortable, warm, and relaxed.
- Check all electrode contacts.
- If interference persists, turn the muscle-tremor filter on. If interference still persists, the problem is probably electrical in nature. See the suggestions for reducing AC interference (in a related troubleshooting tip).

## AC interference

AC interference superimposes even-peaked, regular voltage on the waveforms.



### Causes

- The patient or technician was touching an electrode during recording.
- The patient was touching a metal part of an exam table or bed.
- A lead wire, patient cable, or power cord are broken.
- Electrical devices in the immediate area, or lighting, or wiring concealed in walls or floors are interfering.
- An electrical outlet is improperly grounded.
- The AC filter is turned off or set incorrectly.

### Actions

- Verify that the patient is not touching any metal.
- Verify that the AC power cable is not touching the patient cable.
- Verify that the proper AC filter is selected.
- If interference persists, unplug the electrocardiograph from AC power and run it on the battery. If this solves the problem, you'll know that the noise was introduced through the power line.
- If interference still persists, the noise may be caused by other equipment in the room or by poorly grounded power lines. Try moving to another room.



## Lead alert or square wave



A dot might be flashing on the lead-status screen. Or one or more leads might appear as a square wave.

### Causes

- Electrode contact might be poor.
- A lead might be loose.
- A lead might be defective.

### Actions

- Replace the electrode.
- Verify that the patient's skin has been properly prepared.
- Verify that electrodes have been properly stored and handled.
- Replace the patient cable.

## System problems

### The electrocardiograph won't turn on when it is plugged in

**Causes**

- The AC power connection is faulty.
- An AC fuse is blown.
- There is no AC power.

**Actions**

- Check the AC power source.
- Check the AC fuses.

### The electrocardiograph won't turn on when it is unplugged

**Causes**

- The battery is disconnected or incorrectly connected.
- The battery is low, not charging, depleted, or bad.

**Actions**

- Check the battery connections.
- Recharge the battery.
- Replace the battery.

### The electrocardiograph shuts down during printing

**Causes**

- The battery is low or bad.

**Actions**

- Recharge the battery.
- Replace the battery.

### The electrocardiograph prints fewer than 10 reports on a full battery charge

**Causes**

- The battery is degraded.

**Actions**

- Replace the battery.

## The electrocardiograph does not respond when you press buttons or touch the screen

### Causes

- The electrocardiograph is frozen.

### Actions

- Reset the electrocardiograph by pressing and holding the power button for at least six seconds until the screen goes blank. Press the power button again. The electrocardiograph goes through some diagnostic tests that cause it to take longer than usual to power up.
- Touch the **Settings** tab. Touch the **Advanced** tab. Touch the **Power down** button. The electrocardiograph goes through some diagnostic tests that cause it to take longer than usual to power up.

**Note** For more troubleshooting guidelines, see the service manual.



**CAUTION** The service manual is for use only by qualified service personnel who understand technical English.



Material No. 724162