# MC-1

**MINI CAMERA**

# OPERATION MANUAL


*JW FISHERS MFG INC*
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## *SPECIFICATIONS*

**DIMENSIONS/WEIGHTS:**

- Camera Housing ..... 6”L x 2.375”Dia ..... in air - 16 ounces.
  ... in water -1 oz pos. buoy.
- Cable ..... 0.4”Dia x 150’ - 1,000’L ..... in air 9-60 lbs.
  .....in water 4-30 lbs.

**PERFORMANCE/DESCRIPTIONS:**

- Camera ---------- Black & White CCD.
- Lens ---------- 4 mm 50 deg wide angle.
- Lights (optional) ------ 100/250 w tungsten halogen or LED light ring.
- Cable (basic system) ---------- 6 conductor, Urethane jacketed.
- Operating Depth ---------- 500 feet.
- Color ---------- Yellow/black.
- Sealing ---------- O-ring sealed.
- Power Requirements ---------- 12 vdc, 0.2 Amps, 3 watts.
  ---------- with intermal light ring - 0.4 Amps, 5 watts.
  ----- with external 100 watt light - 1.2 Amps, 103 watts (120 vac).
  ----- with external 250 watt light - 2.7 Amps, 253 watts (120 vac).

**MATERIALS/COLOR:**

- Housing ---------- High impact PVC/yellow.
- Cable ---------- polypropylene/yellow.

## *OPTIONS*

- 150-1,000 ft cable
- 500 foot depth rated housing
- Color camera
- PAL format cameras
- Black & white or color monitors
- Internal light ring
- External 100 or 250 watt lights
- 120 vac
- 220 vac (Europe)

MAINTENANCE

Your MC-1 was designed to be maintenance free. It is constructed of corrosive resistant materials. As with most diving equipment it is recommended that the MC-1 be rinsed in fresh water after use and stored in a cool, dry place.

LIMITED WARRANTY

Your MC-1 underwent constant inspection during assembly to insure many years of trouble free performance. The MC-1 is warrantied for TWO FULL YEARS from the date of purchase. During this period, your Mini Camera will be repaired free of charge should a failure occur due to materials or workmanship. The warranty does not cover broken cables, or damage due to dropping or general misuse.

Should service be required, write or phone us explaining the nature of the problem, and we will provide shipping instructions. All repairs are made at our factory. Repairs by unauthorized persons may void the warranty.



**INTRODUCTION**

JW Fishers MC-1 Mini Camera is a low cost waterproof camera system useful for a variety of applications where cost or size is a major factor. The Mini Camera is so compact and lightweight it can be mounted to a diver's helmet or with internal light ring option can be lowered into a pipe for internal inspections. The MC-1 can assist the commercial diver performing underwater structure inspections or be lowered into the water on a pole to perform shallow water inspections from the surface. The internal LED light ring is available for applications where size is critical such as pipe inspection work. An external 100 or 250 watt light is available for applications where high powered lighting is required. The Mini Camera is surface powered allowing unlimited operating time.

The MC-1 was designed for underwater use, however it can be used out of water with some restrictions. When using the internal light ring, out of water use is limited to one hour of continuous use or the system will overheat. The SL-1 external 100 or 250 watt light cannot be operated out of water for more than 5 or 10 sec (to test light system), or damage will occur to the lights. When operating in the water, the internal light ring, or the external SL-1 lights, can be operated indefinitely. The camera, without lights, can be operated indefinitely out of water.

The base system includes a black & white camera, 250 foot depth rated housing, and 150 feet of cable with a underwater connector at the camera end. The system is powered by 12 vdc. The camera produces sharp, clear video images that are viewed on a topside monitor and can be recorded on a VCR. The MC-1 can also be purchased with a color camera and monitor for those applications where a color picture is required.

The Mini Camera housing is ruggedly constructed of corrosion proof PVC making it an excellent choice for work in depths of up to 500 feet. The cable jacket is constructed of highly abrasive resistant urethane. The external underwater light is water-cooled allowing many operations between bulb replacement.

Options for the MC-1 include:120 vac system with ground fault breaker, 220 volt transformer, 500 foot depth rating, cable lengths up to 1,000 feet, color camera, and black & white or color monitors. Two different light options are available, an internal LED light ring or external light(s). The external light can be either a single 100 watt light, a single 250 watt light, or two 100 watt lights with a mounting bracket.

**CONNECTING THE CABLES:**

VIDEO - The camera coax cable can be plugged into a monitor, VCR, or a TV. The TV can only be used if it has an input jack marked “Video” . Note: most TV’s require selecting “Video Input” using the TV remote or by the switches in the front of the TV. When attaching the coax cable to the monitor, be sure to connect to the video input jack on the monitor. If a VCR is used, connect as follows:

MC-1 hook-up to a VCR:

1. Attach the BNC to RCA adaptor to the video coax connector.
2. Plug the RCA connector into the video input jack on the VCR.
3. You will need a video cable with RCA connectors on it, to connect the VCR to the monitor. Connect this video cable to the video output jack on the VCR and the video input jack on the monitors. It may be necessary to use a RCA to BNC adaptor if you are connecting to a black and white monitor.

POWER - The power hookup depends on the power and other options purchased: See pages 4 and 5 for a cable diagram of each configuration.

- 12 vdc basic system. The end of the power cable has a Red and Black battery clip. The Red clip connects to the positive (+) side of a 12 volt battery and the Black clip connects to the negative (-) side.

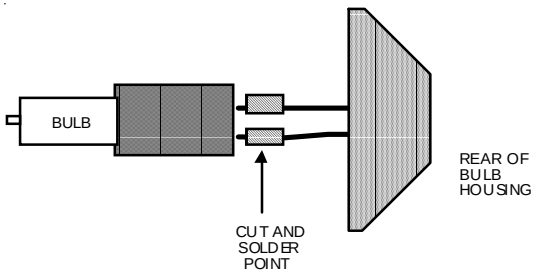
- 12 vdc with internal light ring. The end of the power cable has two Red, and one Black, battery clip. The Red clips connect to the positive (+) side of a 12 volt battery and the Black clip connects to the negative (-) side. One of the Red clips is for the camera, and the other is for the internal light ring (clips are marked).

- 120 vac. A small generator is recommended to supply power for the 120 volt system. A 500 watt unit is adequate to power the MC-1, lights, a monitor, and a recorder. Today's small generators are quiet, lightweight, very portable, and produce a "clean" 120 ac voltage. The second choice is an inverter. Inverters convert 12 volts dc to 120 volts ac. To supply the "clean" ac voltage required by video equipment it is necessary to use a "frequency controlled" inverter. These inverters produce an ac voltage that is consistant in amplitude and frequency, but are typically more expensive than a generator. (continued on next page)

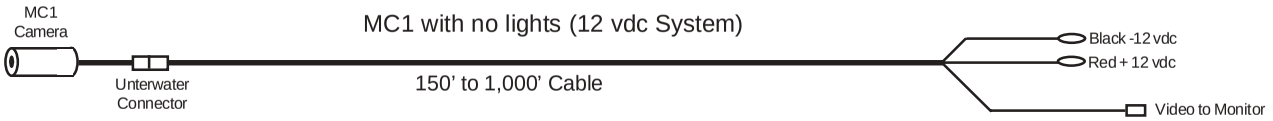


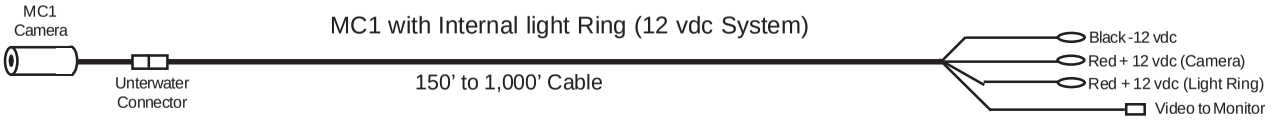
**BULB REPLACEMENT**

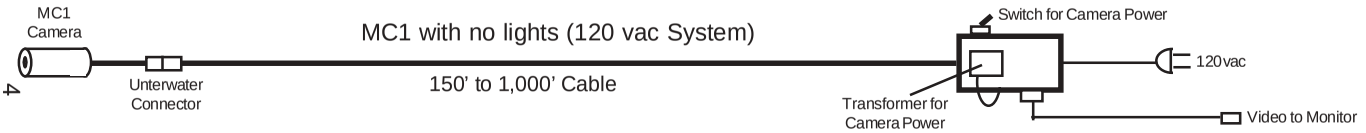
To replace a bulb remove the two 4-40x3/8" screws from the rear of the light housing (see figure 5). Pull the bulb out the rear of the housing. Cut the wires to the bulb (about 1/2" from the bulb), strip away a mimimal amount of insulation, and solder on the replacement bulb. Clean the solder joint and surrounding wires with denatured alcohol or laquer thinner. Form the wires into their final bent position by Inserting the light bulb into the yellow housing and positioning the black cap against the housing. Carefully remove the light from its housing taking care not to unbend the wires. Coat the solder splices and surrounding wires with several thin coats of Aquaseal. Wait about one hour between each coat. Let final coat dry overnight and reassemble light housing. If the sealed joint leaks exposing the solder joint to water, it can cause the ground fault breaker to trip.

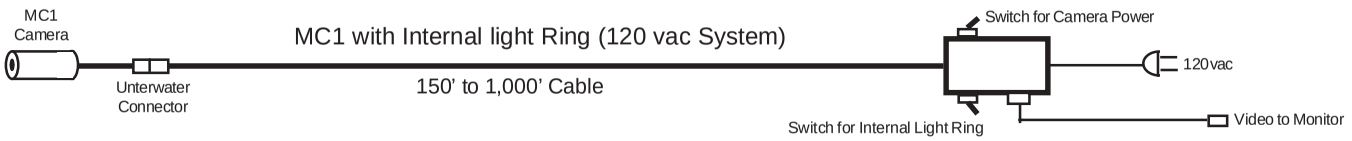


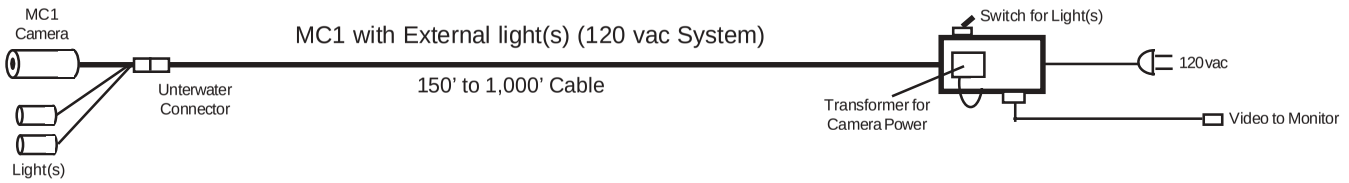

**CAUTION:** The bulbs should not be handled with bare fingers as oil from the skin gets onto the glass and will cause the bulb to burn up. If the bulb is handled with bare fingers, the glass should be wiped with denatured alcohol to remove any oil from the glass.



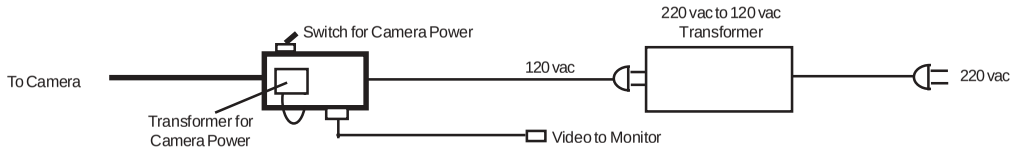



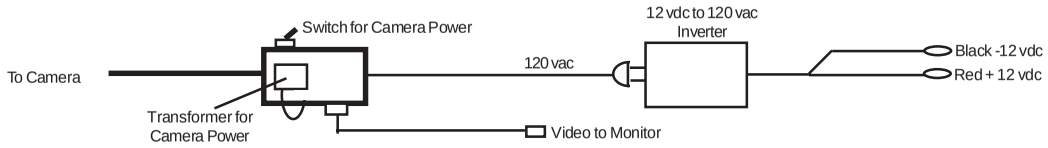






If using 220 vac Power



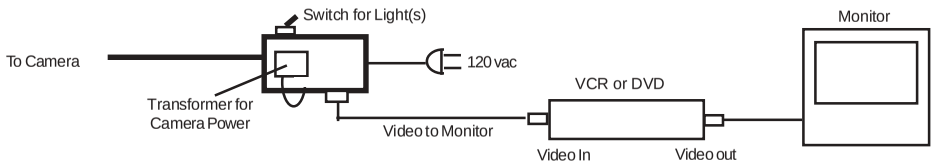

If using 12 vdc Inverter with 120 vac system








If using VCR or DVD to Record Video Output



**POWERING UP THE SYSTEM:**

The MC-1 system comes complete and ready to operate. It is recommended that before deploying the MC-1 into the water the cables should be connected, the power turned on, and the lights and video picture checked for proper operation.

**CAUTION:** Before plugging the main power plug into 120 vac, be sure the light switch on the side of the ground fault box is turned off. The light housings will be damaged if lights are operated out of water for more than five seconds.

Connect the cables as shown in the diagrams on pages 4 and 5 based on the configuration and options purchased.

Turn on the power.

After a few seconds a picture will appear on the monitor. The monitor may require some adjustments to optomize picture quality. The camera lens was adjusted at the factory for proper focus in the water.

Turn the light switch on just long enough (five seconds or less) to make sure the lights are working.

**PUTTING THE MC-1 IN THE WATER**

If all tests are successful the MC-1 is ready for use. Allow 5 to 10 seconds for the lights to cool before putting the MC-1 in the water. Be sure check all connectors and make sure they are locked into place before submerging the housing. When the MC-1 is not in use keep all connectors dry and well away from water.

Always have the camera turned on before submerging the housing. If a leak should occur, moisture in the housing will activate the leak detector and scramble the picture.



With the 120 volt system a GFI circuit breaker is built into the cable. The ground fault box plugs into 120 vac. Should voltage ever come in contact with the water, the GFI breaker will trip shutting power off at the surface. To reset the breaker push the read button back down. Never reset the breaker until the cause of the fault is discovered, and never bypass the GFI breaker.

Power to the camera is either supplied through a switch mounted in the side of the GFI box or by plugging the camera transformer into the GFI box depending on the system configuration. See cabling diagrams on page 4 and 5.

- 220 vac. The same as for 120 vac (above), except a 220 vac transformer is also supplied. The ground fault box plugs into the 220 vac transformer which then plugs into the 220 vac power source.

**CAUTIONS:**

- **Care must be taken when handling the underwater connector. Do not bend the cable as it extends from the connector, bending the cable can cause the connector to leak.**
- **When installing the connector, turn the outside ring until its tight, then turn it "a little bit more" until you can feel a detent or stop.**
- **Do not let camera housing sit in the hot sun.**
- **Do not operate the external lights out of water (will damage the light housings).**
- **Do not operate the internal light ring out of water for more than 1 continuous hour (case will overheat and could damage the camera).**