



CPR SERIES

RODDING REELS

**CE USER MANUAL
CARE INSTRUCTIONS
PRODUCT SPECIFICATION**

PLEASE READ CAREFULLY BEFORE OPERATION OF THIS EQUIPMENT

**CARE AND USE INSTRUCTIONS
PRODUCT SPECIFICATION**

DESCRIPTION

CONTINUOUS ROD INSPECTION CAMERA
FOR DRAIN AND PIPELINE INSPECTION

MANUFACTURER

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PRODUCT SPECIFICATIONS

Crusade Designs Ltd. reserves the right to make changes to the electrical, electronic, optical, mechanical, software and firmware specifications of its products without notification. This product carries a 12-month warranty against defective materials and workmanship without prejudice to customer's statutory rights. Crusade Designs Ltd. disclaims any responsibility for consequential loss or failure due to incorrect use or use with incompatible equipment.

INTRODUCTION

These instructions are limited to the use and care of the CPR series of Rodding reel's and are in no way intended to give guidance on the interpretation of data or the techniques of safe access to line entry points.

The Crusade CPR series of rodding reel's comprise a continuous rod contained on a steel cage complete with all electronics necessary to implement the handling of video, power and measurement. They may be connected to the MIC series of base unit's via its link cable or used via a break out box to any monitor or recording system. Your supplier can advise on compatibility of other existing equipment and details of any modifications required. These instructions assume that the user is conversant with the basic operation of the MIC systems.

OPERATION

Always ensure that none of the equipment is powered up when connecting or disconnecting a camera or any cables.

Before turning the system on please observe the following if you are using a generator. Ensure it is producing the correct 110v ac voltage within plus or minus 10% and please let it operate for one minute before connecting any base unit or ancillary equipment to it. Ensure that all camera equipment is connected before switching the base unit on.

MOUNTING A CAMERA TO THE CPR ROD

The rod can accept 2 types of camera the DRC 420 standard camera and the SRC 420 self righting camera. Insert the camera into the selected skid, small smooth sleeve, medium vaned or large wheeled/ski. Holding the camera in the skid with the forefinger of one hand offer the camera up to the coned fitting on the end of the push cable rod. Locate the pin on the coned rod end in one of the eight holes in the back of the camera. Screw the circular cone ring onto the camera, hand tight, to secure the camera and skid to push rod.

SYSTEM CONNECTION

Plug one end of the 10 metre link cable into the blue box on the side of the cable rod cage. To release the cable depress the raised key on the plug before pulling out. Plug the other end into the breakout box or base unit To release the cable depress the protruding lock plate on the breakout box socket before pulling the cable out. Please note these cannot be connected into the wrong apertures. Do not attempt to increase the length of any of the cable's as the resulting voltage drop may well prevent the system working. If using you own monitor or equipment connect it to the break out box together with a 12V power supply and switch on. The screen will show the camera image plus 000.0 in the bottom of the screen. If the camera image is not correctly orientated (DRC420 only) then switch off and release the camera from the push rod cone fitting and reposition the pin in a different hole on the back of the camera. Re-secure the camera.

TO RECORD THE SURVEY

Insert the recording media into the V.C.R./D.V.D. recorder. On V.C.R.s please use quality media as this will prolong the life of your V.C.R.s heads. Follow the recorder's instruction book to make the recording or to play back. Please note the suggestions for operating the recorder under adverse weather conditions.

OPERATION OF RECORDER'S UNDER ADVERSE WEATHER CONDITIONS.

Please note that V.C.R.s/D.V.D.s have specific operational working parameters of humidity and temperatures as stated in the manual and these should be adhered to. Failure to do this will cause media handling problems. The following are a few hints that may save these problems. Please store the media and the recorder in the same temperature and humidity conditions. Do not store media on the vehicle dashboard. Store all equipment in dry cool conditions. Before leaving to go to the survey site plug the system into the supply and switch the recorder on. This will warm the recorder and hopefully drive any moisture out.

TO USE THE MEASUREMENT

The CPR series reel's have two buttons on the top of its connection box one orange and one green, these function as described below:-

DRUM ZERO (orange) Depress this button when the system is fully connected, the display is showing on the screen and all the rod is in the cage. This sets the absolute zero point for a full cage and is the datum for all measurements. Do not use when rod is unwound from cage. See also MEAS ZERO.

MEAS ZERO (green) This button pad has two functions. Depress this button when the rod has been pulled off the cage and you wish to start measuring from zero, e.g. At the start of the pipe run or between subsequent manholes. Depress and hold down this button when you wish to zero and insert a focal factor at the start of the pipe run, release it when the desired factor is showing on the screen. The measurement factor increases in 0.1 metre increments up to a maximum of 2.0 metre and then reverts to 0.

Always at the start of a survey make sure that all the rod is on the reel. Press the orange button (drum zero) only when the camera is in the start position i.e. in the pipe opening do you press the green button (measure zero) to get the focal point, hold in the green button until the desired reading is shown on the screen

Suggested readings are:-

100mm dia pipe =	000.1	
150mm dia pipe =	000.2	(with all the spring showing)
225mm dia pipe =	000.3	

Should you need to survey through a manhole, at the start of the next survey the green button should be pressed. Do not press the orange button.

TO CONDUCT THE SURVEY

Please note the cable rod, because of its nature, is only covered by a three month warranty against faulty manufacture. A full warranty is available. Release the holding chain on the rodding reel, taking care to control the rod. Insert the camera in the pipe and push it down the pipe. Great care must be exercised when handling the cable rod as the armored hose contains a glass fibre rod which has a limiting bend radius. When inserting the rod into the pipe at the bottom of the manhole do not use any force that pushes the rod into a corner and increases the sharpness of the natural bend of the rod entering the pipe as this will cause inner fibre rod break. The ideal solution is to use a length of guide pipe with a 45 degree bend on the end to enter the camera into the pipe. This will also make pushing the camera from on top of the manhole much easier. Similarly when removing the camera from the pipe do not pull vertically up. This will again create over-sharp bends and damage the glass fibre rod. The camera will come out gently and smoothly with little force being required. Damage caused by over-sharp bends shows up in the nature of the break and can easily be seen when we replace the rod. If you have any doubt about this please ask for a sample length so that you can see how difficult it is to break the fibre glass rod. This damage is not covered by warranty and will only be covered at our discretion if the rod warranty has been taken out at the time of purchase. When removing the camera from the pipe great care should be taken in handling the rod being pulled out behind the operative. Push the rod back into its cage, if necessary place one foot on the side bottom bar of the frame to prevent the rodding cage from sliding over the floor. Leave the camera just protruding from the cable rod guide ring and fasten the shackle to the cage of the rodding reel. The camera may be left in this position, provided the cage is securely fastened in an upright position to prevent falling over and damaging the camera during transportation.

CARE INSTRUCTIONS

HANDLING

The reliability and lifetime of this camera will depend in large measure on the care it receives. It has been designed for the harsh environment of drain inspection but, as with any other equipment, it will repay a little care taken in its use and regular cleaning and inspection afterwards.

CLEANING

The comments below apply to the camera head and the mating socket except where detailed. All exposed metal parts are either painted steel or stainless steel. These units are rated for use in salt water but it is recommended that they be cleaned as soon as possible after use in even slightly saline solutions or in any media that is suspected to contain chemicals such as bleach or acid in solution. Cleaning is always easier and more effective when the deposit is fresh.

DO's

- All items should be cleaned with a mild detergent solution (e.g. washing-up liquid). It is quite safe to immerse the camera. Isopropanol (industrial alcohol) can be used to remove tar, fresh lining compounds etc.
- Remove, clean and inspect the 2mm O ring seal at the front of the cone. To remove the O ring without damaging it, rub a blunt tool (a plastic pen top is good) along the O ring until it bunches up and can be hooked out. Clean the seat and ensure it is dry before refitting the O ring. Replace the O ring if there are any signs of damage.
- Pay particular attention to the camera retaining threads as silt, sand and similar material can be quite abrasive. A toothbrush and a small paintbrush are ideal for cleaning most of the recesses on all items.
- Rinse thoroughly in fresh water and allow to dry.
- Use a soft lint-free cloth or proprietary lens cleaning tissue to clean any smears left on the lens cover after rinsing.

DO NOT's

- The camera should not be cleaned by immersion if there is any suspicion that the watertight integrity of the lens or LED protection has been breached.
- Do not scrub the lens covers to remove particulate material as you may scratch them. Scratches on the LEDs are of little consequence but scratches on the lens covers will result in the appearance of an imperfectly focused picture when severe enough.
- Petroleum-based products or proprietary electrical equipment cleaners such as WD40 may contain solvents that attack non-metallic parts and should not be used.
- The electrical connections in the mating sockets are gold plated so should not be abraded.
- Do not use a high-pressure water-jet or steam cleaner.

MAINTENANCE

ROUTINE SERVICE

Regularly check all cable's for splits both small and large, immediately cover these with amalgamating tape to keep moisture out. This will prolong the life of your cable without upsetting the measurement system. Regularly check cable plug's.

The worst case estimate for the lifetime of the moving parts of the CPR series is two years of constant daily use at which point the rotating seals of the axles may require replacement to maintain watertight integrity. It is probable that most users will achieve considerably longer service intervals, particularly if they follow the cleaning regime above. There are few other service items that will require routine replacement and these items form part of the service together with the axle seals. It is suggested that the unit be returned to the factory at yearly intervals for simple functional and pressure integrity tests. Advice as to service requirements can be given on the basis of these tests.

There are no user serviceable items inside any of the equipment covered by these instructions. Aside from regular cleaning, the only user serviceable items are replacement of cable's and skids.

TROUBLESHOOTING

If the picture flashes on and off whilst the camera is moving, suspect a cable or connector somewhere in the system and check that all connectors are right home.

SPECIFICATION

Camera

Length	80mm
Diameter	42mm
Lighting	24 high bright white led's
Environmental	Waterproof to 5m; immune to salt water
Lens protection	Sapphire disc
CCD	400 lines; sensitivity 3 lx with f2.0 lens
Angle of view	Approximately 70 degrees x 90 degrees
Skids	3" and 4" supplied 6" optional

Push Rod

Cable Length	30,40 or 60 meters
Stiffening	Glass reinforced composite
Strength member	High tensile steel
Connector.	5 Pin X.L.R..
Video Out	1 Vpp Neg Sync P.A.L.
Supply	12 V DC

Cage

Length	770mm
Width	510mm
Height	750mm

Measurement

System	Optical encoder microprocessor scaling
Accuracy	2.5%
Resolution	0.1m

Total Weight 28kg **Supply Voltage** 12 volt DC **Supply Current** 1 amp

Compliance:

Electromagnetic Compatibility Directive 89/336/EEC. Electrical Equipment Directive 73/23/EEC.