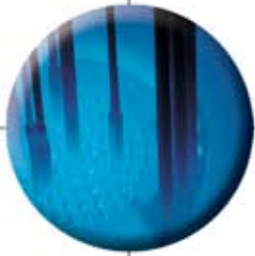


# REES Cables & Connectors



IST **R90 Series Cables and Connectors** are designed for use with all of the R90 Series nuclear cameras and have been specifically developed for nuclear applications underwater or in air.

All the IST R90 Series cameras have a very high radiation tolerance which is partly achieved by their dual unit construction with the majority of the camera electronics being contained in a separate camera control unit (CCU) outside the active area. This design approach reduces radiation damage, while also ensuring easy service access. The CCU's are linked to their associated cameras by single composite camera cables - with matching connectors - which provide all the necessary power, control and signal functions.

## Features

- Air and underwater applications
- Radiation tolerant
- Wide range
- Specifically developed for nuclear operations
- Site reterminable connectors
- Field proven design

## Rees Minikevlar 102.00.042



31 core camera cable with kevlar strength member, XLPE cores, and polyurethane elastomer jacket.

### Cores

- 2 coaxials 75 ohm
- 1 screened quad (7 x 0.2mm) <.008">
- 2 groups of 7 (each 7 x 0.2mm)
- 1 group of 5 (each 7 x 0.2mm)
- 3 singles (each 7 x 0.2mm)
- 3 earth returns (each 16 x 0.2mm)

### Mechanical

Diameter .....	11.30mm <.44"> (±0.38mm) <.015">
Installation bend radius .....	82mm min (3.2")
Continuous flexing bend radius.....	165mm min (6.5")
Weight in air .....	170g/m (.44 lb/yd)
Break strength.....	324kg (714 lb)
Operating temp.range .....	-20° to 70°C (-4°F to 158°F)
Total radiation dose .....	106 Gy (108 rads)

### Electrical

75 ohm coaxial:	
Characteristic impedance .....	75 ± 2 ohms
Attenuation .....	5.7 dB per 100m (328') at 10 MHz
XLPE Insulated Cores:	
dc resistance .....	8.8 ohms per 100m (328') nominal
Earth returns:	
dc resistance .....	4.0 ohms per 100m (328') nominal

## Specifications and Performance

### TV36 102.00.019



36 core camera cable with kevlar braid, XLPE cores and polyurethane jacket.

#### Cores

3 coaxials 75 ohm

1 group of 14 (each 7 x 0.16mm) <.006">

1 screened group of 7 (each 7 x 0.16mm)

1 group of 4 (each 7 x 0.16mm)

1 screened group of 4 (each 7 x 0.32mm) <.012">

4 singles (each 7 x 0.23mm) <.009">

#### Mechanical

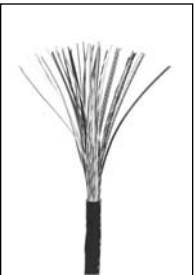
Diameter.....	16.45mm <.65"> (max 16.90mm<.66">)
Break strength.....	1000 kg (2205 lb)
Minimum Installation bend radius.....	100mm (4")
Continuous flexing bend radius .....	240mm (9.5")
Weight in air .....	0.34kg/m (.75 lb /yd)
Operating temp. range .....	-20° to 80°C (-4°F to 176°F)
Total radiation dose .....	106 Gy (108 rads)

#### Electrical

75 ohm coaxial:

Characteristic Impedance .....	75 ohms
Attenuation .....	4.7 dB per 100m at 10 MHz
Insulated Cores .....	dc resistance at 20°C (68°F)
7 x 0.32.....	3.59 ohms per 100 m (328')
7 x 0.23.....	6.83 ohms per 100 m (328')
7 x 0.16.....	14.4 ohms per 100 m max (328')

### Rees Minicable R000CAB014



A special 31 core camera cable with a very small diameter and bend radius, polyester tape cores and polyester elastomer jacket.

#### Cores

2 coaxials 75 ohm

1 screened quad (7 x 0.2mm) <.008">

21 singles (each 7 x 0.2mm)

3 singles (each 19 x 0.2mm)

#### Mechanical

Diameter.....	8.8mm <.35">(±0.6mm) <0.2">
Installation bend radius .....	45mm min.(1.8")
Continuous flexing bend radius .....	90mm (3.5")
Weight in air .....	0.14kg/m (0.31lb/yd)
Operating temp. range .....	-20° to 80°C (-4°F to 176°F)
Total radiation dose .....	106 Gy (108 rads)

#### Electrical

75 ohm coaxials:

Characteristic impedance .....	75 ohm ± 2 ohms
Attenuation .....	5.7 dB per 100m (328') at 10 MHz
Polyester Tape Insulated cores .....	dc resistance at 20°C (68°F)
7 x 0.2mm.....	8.8 ohms per 100m (328')
19 x 0.2mm.....	3.2 ohms per 100m (328')

# REES Cables & Connectors

## R90 Series Cables

### Standard Cables

Cable	Separation (m) Camera to CCU	Operation Notes
TV36 102.00.019 17mm dia (.67")	200	Lighting current 6A max Full R937 options available
Minikevlar 102.00.042 11mm dia (.43")	100	Lighting current 6A max R937 has reduced options

### Special Cables

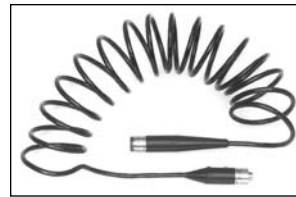
Cable	Separation (m) Camera to CCU	Operation Notes
Minicable R000CAB014 8.8mm dia (.35")	100	Lighting current 5A max R937 has reduced options
Spiral cable 8.8mm dia (.35") 50mm dia coils (2")	100	Lighting Current 5A max R937 has reduced options
Platform Cable		Full application specifications are required before this cable can be considered.

### Rees Platform Cables



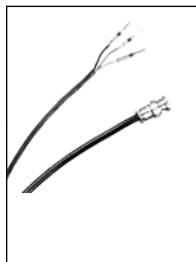
Platform festoon cables are available to special order.

### Rees Minicable Spiral



Special expandable spiral versions for the Rees Minicable are available.

### Video Control Cable CAB.00640



This cable combines a video cable and a two core control cable into one figure of 8 assembly. Cores are constructed in PVC (cellular polyethylene for the coaxial) with PVC jackets.

The CAB.00640 cable is designed for use in air and is mainly used in applications specifying Rees Operator Control Units, where it is used as the interconnecting cable to any master control and video switching matrix used, and where RS485 control system philosophies have been adopted.

#### Cores

- 1 screened twisted pair
- 1 coaxial

#### Mechanical

Diameter.....6.15mm (.24") & 11.30mm (.44")

### Video Cable CAB.00650

This is a high quality coaxial cable intended for fixed installation. It comprises 1 x 1.15mm (.45") plain copper conductor with solid polyethylene dielectric, plain copper wire braid and black PVC sheath.

#### Mechanical

Diameter .....10.3mm (.405")  
 Minimum installation bend radius .....125mm (4.9")  
 Weight in air .....0.15kg/m (.33lb/yd)  
 Operating temperature range .....-30°C to 85°C (-22°F to 185°F)

#### Electrical

Characteristic Impedance .....75 ohms  
 Attenuation .....1.6 dB per 100m (328') at 10 MHz.

## Rees 90 Series Connectors

### Standard Site Reterminable Underwater Connectors



IST underwater connectors are constructed in stainless steel. All interconnections are protected by seals. Terminations are made using high quality contacts. All of the R90 series underwater connectors share the same, basic mechanical design with size and inserts dependent upon the camera cable and/or camera selected.

Depth rating ..... 100 m (328')

Minimum installation distance from camera connector to cable path perpendicular to cameras axis

with TV36: ..... 270mm (10.6")

With Minikevlar: ..... 205mm (8.1")

With Minicable: ..... 170mm (6.6")

Voltage Rating: ..... 600 V dc

Current Rating: ..... 5 A

Break Strength w/Minikevlar or TV36..... Better than 75 kg (165lb)

Camera Connector	Insert	Contacts	Cable Center	Diameter (mm)	Length (mm)
R930CNR04A	24 pin	Solder	Minikevlar	30	117
R930CNR06A	24 pin	Solder	TV36	33	117
R930CNR08A	24 pin	Solder	Minicable	30	117

### Special Underwater Molded Connectors

A range of moulded connectors are available to special order. Moulded connectors cannot be reterminated, but they can operate to a depths in excess of 200 m (656"). The minimum installation distance from the back of the camera (with cable leaving at right angles) is 230mm (9") with TV36, 210mm (8.3") with Minikevlar, and 180mm (7.8") with Minicable.

Break strength with minikevlar or TV36 is 75 kg (165 lb).



Rees Underwater Moulded Connector



Rees 90° Stainless Steel Connector

Use of the 90° connector reduces the total bend radius from the back of the camera to the cable perpendicular to 75mm (3") for all cable types.

### Camera/CCU Mating Connectors

	Camera	CCU		
Cable Type	R93 (20 way)	Mk 2/Mk 3 (24 way)	Mk 3 (48 way)	Plug End
Minicable	R930CNR08A	R930CNR12A	R930CNR09A	R937CNR07A
Minikevlar	R930CNR04A	R930CNR10A	R930CNR05A	R937CNR07A
TV36	R930CNR06A	R930CNR11A	R930CNR07A	R937CNR07A

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