Universal Industrial Television Equipment KUA 250

Owing to our experience extending over many years in the construction of television equipment for industrial and research purposes we have been able to produce the Industrial Television Equipment KUA 250 in such a manner that it is able to fulfil the extraordinarily numerous and varied requirements of industrial television.

The equipment is constructed upon the **Building-block** principle. A carefully worked-out system of basic and accessory units makes it possible, through appropriate combinations of the various units to assemble both simple equipments consisting of only a few units and costing correspondingly little and also large equipments comprising many units. Subsequent extension of an existing equipment is possible at any time. The constructional and circuit arrangements necessary to enable such extension are already present even in the simplest equipment.

A special feature of the new Universal Industrial Television Equipment KUA 250 consists in the fact that cameras including either Vidicon, Image Orthicon or Rieseliko camera tubes can be employed as desired, together if required. For this reason it is possible to suit each equipment in the best possible manner, both as a whole and in its separate parts, to the varying requirements of different situations, e. g. in respect of illumination, definition, reproduction of moving objects, etc.

In designing the units of the Universal Industrial Television Equipment special emphasis was laid upon solid construction suitable even for rough working conditions, simple manipulation and great reliability, so that it is possible to operate the equipment even without expert servicing and attendance.
The units of the equipment are produced in the form of construction tested in studio operation with high-quality components and for the most part with long life tubes, so that for example, in the Vidicon camera equipment only three different types of valve are employed.

Features:

1. Extremely good adaptation to objects of all kinds and widely differing conditions of illumination are provided by the use of Vidicon, Image Orthicon and Rieseliko cameras.
2. Central Operating Unit for all types of camera.
3. Units may be combined in many ways and extended as required.
4. Remote control and remote adjustment of the cameras by means of simple d. c. circuits.
5. Scanning at 625 line standard, with interlace.
6. Sturdy construction in dust-proof housings, or on standard racks.
7. Great reliability owing to high-quality components of long working life.

Basic Construction of the Equipment, Accessories and Additional Units

Each equipment, irrespective of its extent and the purpose for which it is to be employed, includes the following basic units: **Cameras** for pickup, **Viewers** for reproducing the picture and arrangements for supplying the camera with the necessary working voltages as well as for the amplification and other operations upon the picture signal provided by the camera. In the Universal Industrial Television Equipment KUA 250 these arrangements are collected in a **Central Operating Unit,** which is connected with the camera through the **Camera Cable** and to the viewer by way of a **Coaxial Cable.** Electrical adjustment of the camera is effected with reference to the television picture at a **Control Unit,** which is fitted in the neighbourhood of the viewer and is connected to the central operating unit through a **Control Cable.**

The **Cameras** for the equipment contain only those components which are absolutely necessary and are therefore particularly small and of light weight. They can thus be installed even in positions where the space is very limited.

The **Viewers** can be fed with either video-frequency or high-frequency signals; in the latter case distances up to several kilometres can be bridged.

The **Central Operating Unit** does not require any servicing or attention and can therefore be installed without reference to the positions of the camera and viewer.

The basic units, Camera, Operating Unit, Control Units and Viewer are available in different forms and can be combined with each other in any desired manner.

To extend the scope of the equipment and to solve particular problems a series of accessories and additional units has been developed, which match the basic units. At the present time there are available the following accessories and additional units, built either by us or by the appropriate firm:

Interchangeable Lenses of various focal lengths, including zoom-lenses for the Vidicon Camera KUV 100 — Leaflet

Twin Lens Turret Ki 50, manually controlled

Twin Lens Turret Ki 500, for remote control

Remote Control of diaphragm and focus

Test Projector for monitoring camera adjustment

Telephone Headsets for communication between camera and control position

Protective Housing ZGU 1 for Vidicon Camera KUV 100 — Z 87

Protective Arrangement ZGU 2 for Image Orthicon Camera KUO 100 and Rieseliko Camera KUI 100 — Z 88

Underwater Protective Housings for all types of camera

Change-over Unit ZUA 250-9 with remote control for selecting the picture from one of several cameras for reproduction — Z 81

BAS Change-over Switch for rapid alternation between two pictures (manually controlled)

Pulse Distributor for the operation in parallel of a large number of equipments

Twin-picture Unit ZDU 250-9 for combining two pictures in one viewer — Z 82

Optical Pointer Unit ZLU 250-9 for mixing with the picture a luminous indicator — Z 83

Crossbars for connecting the picture signals from different cameras to different receiver connections as required

Light intensity Control for Image Orthicon Camera KUO 100 for the equalization of fluctuations of illumination of the object within the ratio 1:50,000, manually or automatically controlled — Z 84

Pan and Tilt Heads with **Motor Drive** for remotely controlled tilting and panning of the camera, also with control unit for moving to preselected positions — Z 86

Slide Projector ODU 1 for the transmission of small-format slides with Vidicon Camera KUV 100 — D 80

Aperture Corrector Unit ZEU 1/250-9 for increasing the definition in the picture in the line direction — Z 85

Pulse Inverting Amplifiers for operating the equipment with studio-type pulse generators

Microscope Assembly for assembling a television microscope

Light-box for the transmission of drawings etc.

Cameras

Three different cameras have been developed for the Universal Industrial Television Equipment KUA 250, which differ mainly in the type of camera tube which is employed. There are available:

Vidicon Camera KUV 100
Image Orthicon Camera KUO 100
Rieseliko Camera KUI 100

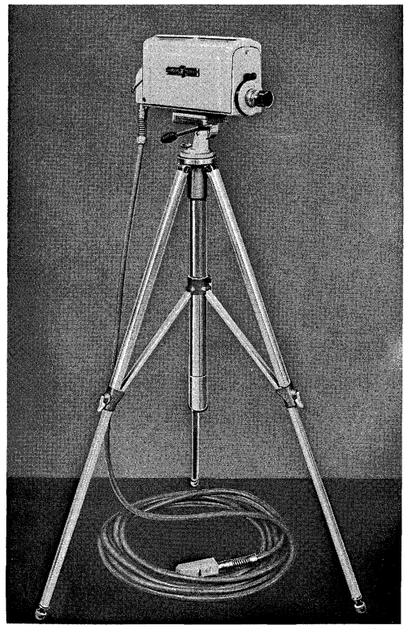

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Fig. 1: **Vidicon Camera KUV 100,** standard construction with Rapid-change Mounting Ki 043 and sub-standard film camera lens, on tripod.

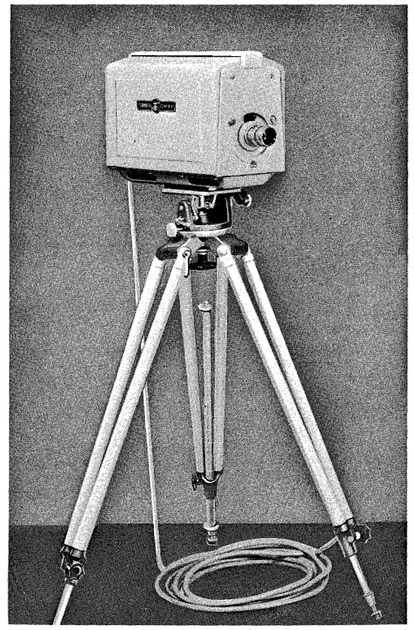

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Fig 2: **Image Orthicon Camera KUO 100** with Rapid-change Mounting Ki 101 and special lens, on tripod.

The **Vidicon Camera** is of smaller dimensions, lower weight and simpler construction. The camera is inexpensive to procure and to operate and will therefore normally be used. The Vidicon employed as the pickup tube provides pictures of good definition and gradation, but, however, exhibits a certain lag, especially with lower illuminations of the object, which limits the use of the Vidicon Camera to transmissions where too-rapid movements do not occur in the picture.

The **Image Orthicon Camera** is distinguished by extremely high sensitivity and is therefore employed in those cases when it is necessary to transmit objects under very poor illumination. The Image Orthicon does not suffer from lag and is therefore suitable for the transmission of rapidly moving events. Because of the larger and more complicated pickup tube and the accessories necessary for its operation the Image-Orthicon Camera is larger and heavier than the Vidicon Camera.

The **Rieseliko Camera** provides pictures of particularly good definition and gradation and is therefore used in those cases where the picture quality is most important. The Rieseliko used as the pickup tube can also handle greater contrast in the object and operates completely without lag. The Rieseliko Camera, however, like the Vidicon Camera, can be used only under good illumination. The camera is fitted in the same housing as the Image Orthicon Camera.

Rapid-Change Mounting for Remote Control Ki 052

Width 188 mm
Weight about 240 g

Motor Drive Assembly OAU 1 for remote control of aperture or focus

Weight about 500 g Driven by 12 V d. c.
For adjusting both aperture **and** focus, two assemblies OAU 1 are necessary

Twin Lens Turret Ki 050

Weight (without lenses) about 630 g
Radius of control lever 130 mm

Lens Sets 16 mm sub-standard film-camera lenses

Set No.	Lens I	Lens II	Set No.	Lens I	Lens II
1	1.9 16 mm	1.5 25 mm	6	2.0 50 mm	3.8 75 mm
2	1.9 16 mm	3.8 75 mm	7	2.0 50 mm	3.8 100 mm
3	1.9 16 mm	2.0 50 mm	8	3.8 75 mm	3.8 100 mm
4	1.5 25 mm	2.0 50 mm	9	3.8 75 mm	4.5 150 mm
5	1.5 25 mm	3.8 75 mm	10	3.8 100 mm	4.5 150 mm

Twin Lens Turret for Remote Control Ki 500

Weight about 1.3 kg (without lenses)
Driven by 12 V d. c.
Time of Lense Change about 3.5 sec.

Lens Sets 16 mm sub-standard film-camera lens with light hood

Set No.	Lens I	Lens II	Set No.	Lens I	Lens II
1	1.9 16 mm	1.5 25 mm	9	2.0 50 mm	3.8 75 mm
2	1.9 16 mm	2.0 50 mm	10	2.0 50 mm	3.8 100 mm
3	1.9 16 mm	3.8 75 mm	11	2.0 50 mm	4.5 150 mm
4	1.9 16 mm	3.8 100 mm	12	3.8 75 mm	1.9 11.5 mm
5	1.5 25 mm	2.0 50 mm	13	3.8 75 mm	3.8 100 mm
6	1.5 25 mm	3.8 75 mm	14	3.8 75 mm	4.5 150 mm
7	1.5 25 mm	3.8 100 mm	15	3.8 100 mm	4.5 150 mm
8	1.5 25 mm	4.5 150 mm			

Lenses without light hood can be combined together likewise.

Test Projector OPV 10 for Vidicon Camera KUV 100:
Test-picture on the photo-conductive layer (9.5x12.7 mm

Tripod with tilting head:

Height max. 1.65 m
Weight about 2.9 kg

Protective Housing ZGU 1

Overall length 780 mm
Width 270 mm
Height 270 mm
Weight about 17.5 kg

Headset:

Weight about 390 g

Image Orthicon Camera KUO 100

Dimensions:
Height 335 mm
Width 255 mm
Length 470 mm
(Without lens)

Weight: about 22.5 kg
(without lens)

Valves:
1 Image Orthicon
3 x EF 800, 4 x E 88 CC,
3 x PL 81, 2 x PY 83, 1 x 85 A 2

Rieseliko Camera KUI 100

Dimensions:
Height 335 mm
Width 255 mm
Length 470 mm
(without lens)

Weight: about 21.5 kg

Valves:
1 Rieseliko IS 9 12
7 x E 88 CC, 3 x EF 800,
3 x PL 81, 2 x PY 83

The Image Orthicon and Rieseliko cameras are supplied with rapid-change mounting Ki 101 for studio lenses (thread M 48 x 1, flange focus 53 mm).

Lenses and Accessories for the Image Orthicon Camera KUO 100 and Rieseliko Camera KUI 100

Type:	Aperture	Focal Length in mm	Horizontal Angle of View
Xenon*)	2.0	50	35.5°
Xenon*)	2.0	75	27°
Astro-Tachonar	1.0	75	27°
Xenon*)	2.0	100	18°
Xenotar	2.8	150	12°
Tele-Xenar*)	4.5	150	12°
Tele-Xenar	5.5	200	9°
Tele-Xenar*)	5.0	300	6°
Telagon	4.5	400	4.5°
Telon	5.0	600	4°

All lenses with adjustable iris diaphragm.

*) These lenses are provided with adjusting mountings for focus adjustment. For remote control the lenses (except Astro Tachonar 1-D/75) are available with toothed rings instead of the knurled rings for the aperture- resp. focus-adjustment with the additional reference "S"

For KW lenses (thread M 42 x 1, flange focus 48 mm) the rapid-change mounting Ki 099 is available.

Motor Drive Assembly OAU 1 for remote adjustment of aperture or focus:
Length 135 mm
Weight about 0.5 kg

Test Projector OPO 10 for Image Orthicon Camera KUO 100
Test-picture on the photocathode of the Image Orthicon 26.4x35.2 mm

Test Projector OPI 10 for Rieseliko Camera KUI 100
Test-picture on the photocathode of the Rieseliko 12 x 16 mm

Tripod:
Medium weight with panoramic head
Weight about 11.7 kg
Height max. 1.65 m

Headset: Weight about 390 g

Central Operating Unit KVsU 250-23

		in Standard Cubicle I	for Rack Mounting
Dimensions:	Height	865 mm	814 mm
	Width	550 mm	520 mm
	Depth	290 mm	max. 250 mm