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Technical Information

ARRIFLEX Cameras in Operation at Low Temperatures

A. Operation at temperatures to approx. —4° F

Standard ARRIFLEX cameras, treated with our special wide range lubricants, function without any particular modifications down to temperatures of approx. —4° F.
A faultless, fully charged battery is a prerequisite; the capacity e. g. of a lead accumulator at the above temperature consists of only approx. 60 % of the nominal capacity at + 68° F.
In addition, the battery load, with regard to the camera mechanics, increases with dropping temperature because the greater torque moment must be overcome through increased motor performance resulting in higher current consumption. This is caused by different coefficients of expansion of the bearings and sliding parts, and increasing viscosity of the lubricant.

1.) Preparation and Treatment of the Power Source

When filming at temperatures down to —4° F, the power source must be given special attention:
Under all circumstances, use a faultless, fully charged battery, if possible a battery with a higher capacity but the same voltage; keep a second battery in reserve.
Check that the battery connections are in perfect condition, not oxydized, and that the cables are intact.
Carry the battery under clothing or in a thermal insulated cover, to prevent rapid cooling off of the tempered battery at low ambient temperatures. (During discharge, the battery warms up somewhat.) During shooting breaks, keep the battery in heated rooms if conditions allow.
The battery should be thoroughly charged after each use or after a longer storage period.

2.) Preparation of the Camera

No particular steps are necessary. Ventilation holes could be punched in the rubber eyecup as a precautionary measure against moisture or ice on the eyepiece lens.
Optical surfaces can be treated effectively with "Josta Klar W" lens cleansing tissues.
In addition, a deep sunshade is recommended to protect lenses even in heavy snowfall.

3.) Camera in Operation

A camera at room temperature can be taken into cold temperatures; it must not, however, be taken out into a snowstorm without precooling beforehand. This would result in an immediate freezing-over of the whole apparatus.
Lenses and eyepiece lenses in particular should not be breathed on because of the danger of freeze-over caused by the condensation. Wherever possible, the camera should not be kept out too long at very low temperatures. An insulating cover (blanket, etc.) helps to delay cooling off.

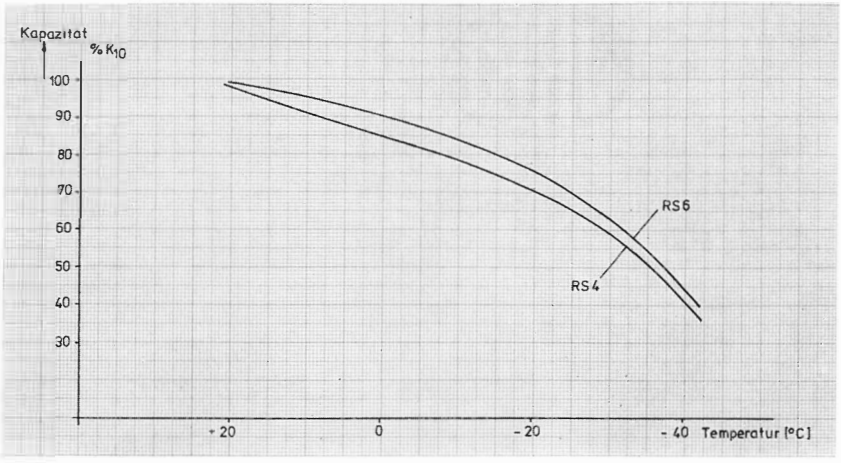
4.) Storage of the Camera

When the camera comes out of operation, it should ideally be put in a room with a temperature of around zero. This avoids precipitation in the form of ice water or condensed water.
If the camera is brought temporarily into a warm room, it should be put into a plastic bag, which is then sealed to be airtight. The camera warms up to room temperature; the precipitation settles on the outside of the plastic bag, not on the camera.
The same effect is attained when the cold camera is put in the storage case until its temperature equals the respective room temperature. If this is not observed, and filming is recommenced with the camera not completely dried out, freezing of the condensed water can result in interference of operation. Rusting of the metal parts is also possible.

B. Operation of ARRIFLEX camera at sub-zero temperatures

For filming in the sub-zero range of —4° F to —49° F, ARRIFLEX cameras must be refitted at the factory or in authorized service shops. This costly "winterizing" is only worthwhile for constant use or for use over an extended period of time, as refitted cameras are not suitable under normal conditions, and there is considerable expense involved in restoring the camera to its original state.

Capacity of round cells of the types RS 4 and RS 6 depending on the temperature at 2,5 A discharging current.



1.) Preparation and Treatment of the Power Supply

The stipulations described in A 1 are valid on an increased scale for filming at sub-zero temperatures to —49° F. The above graph illustrates the radical fall of the nominal capacity e. g. of round cells of the NC accumulator at extremely low temperatures. This progressive capacity loss can be counteracted by choosing a higher battery capacity, by using a heated, thermal insulated container for the battery, or if possible, using a portable generator driven from an internal combustion engine.

2.) Preparation of Camera and Accessories ("Winterizing")

It is profitable to refit a used camera where the bearings are already run in. The camera and all accessories, especially the lenses, are taken apart for a general overhauling, and all lubricants are removed.
The entire camera including accessories is lightly lubricated with a special lubricant for low temperatures, e. g. Isoflex PDP 38, PDP 38/350, or Aeroshell No. 7. Oils and greases with a silicon base should never be used, because the lubricant can leave a film on the optical surfaces, which is very difficult to remove.
The electrolyte condensors in the governor-controlled motor are replaced by Tantal condensors for lower temperatures.
The transistors can be tested for their usefulness against cold by spraying with "Instant Freeze".
Rubber camera connecting cables, which break at about —40° F are exchanged for more suitable Neopren cables.
The rubber eyecup should be replaced by a self-made leather eyecup with perforated air-holes. A waxing of the surface protects the leather against moisture loss.
Following these measures, a trial run should be made on the camera, after having been in cold storage for approx. 24 hours.

3.) Camera in Operation

Special attention should be given to paragraph A 3.
The camera should be wrapped in a black (because it absorbs some heat from the sun), closable protective cover, against icy winds, and minute ice particles which penetrate everywhere.
Whenever possible, the camera should be left in sub-zero temperatures for only a short period each time, to avoid difficulties with the film, which loses its elasticity in extreme cold and splinters easily.
Attention! Cold film is razor sharp.
At temperatures under —40° F, Ester or Polyester (Mylar) film is preferable to acetate-based film.
For loading, the film should have the same temperature as the camera, should be stored airtight until just before loading, and should not be kept in the cold camera too long; after one day, at the latest, it is dried out and brittle.
In addition, the discharge of static charges (flashes) caused by dry film can damage some of the shots.
Silk gloves worn underneath woollen gloves have proven the best hand covering for the cameraman.

4.) Storage of the Camera

Same as under paragraph A 4.

5.) Miscellaneous

The factory guarantees functional competence of the camera electronics down to —40° F.
Operation of the ARRIFLEX 16 BL with precision motor control, Pilotone and start marking device under —4° F is only possible after being refitted in the factory. Sound filming according to the single system sound module system is practically impossible under approx. —4° F.
The ARRIFLEX 16 M has proven itself as especially well suited for filming at low temperatures, above all through the direct magazine drive, the easy handling of the hinged camera door, and the easily removable side section in case of mechanical defect.

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