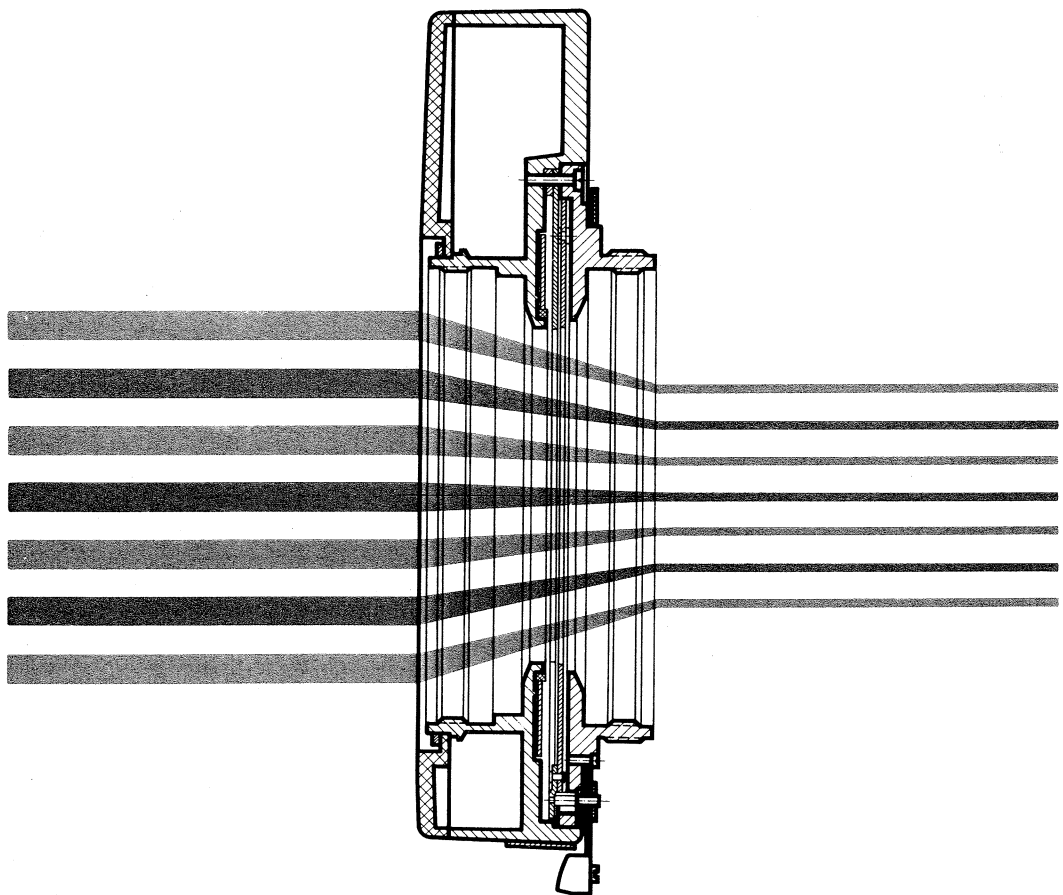


COMPUTER
electronic

COMPUR PRONTOR

EXPOSURE CONTROL



EXPOSURE SHADING

Scientific research in almost every field as well as industrial control and regulation engineering make use of the absolutely fastest medium.

L I G H T

Whenever one of the numerous problems of signal transmission has to be solved, the problem occurring most frequently is that of finding a suitable exposure control. Today modern engineering offers a great number of possibilities where light can be used for transmitting signals; for instance in the control of manufacturing operations, in research and in measuring techniques in biology, medicine and psychology; even for material machining a complete enumeration of potential uses is hardly possible.

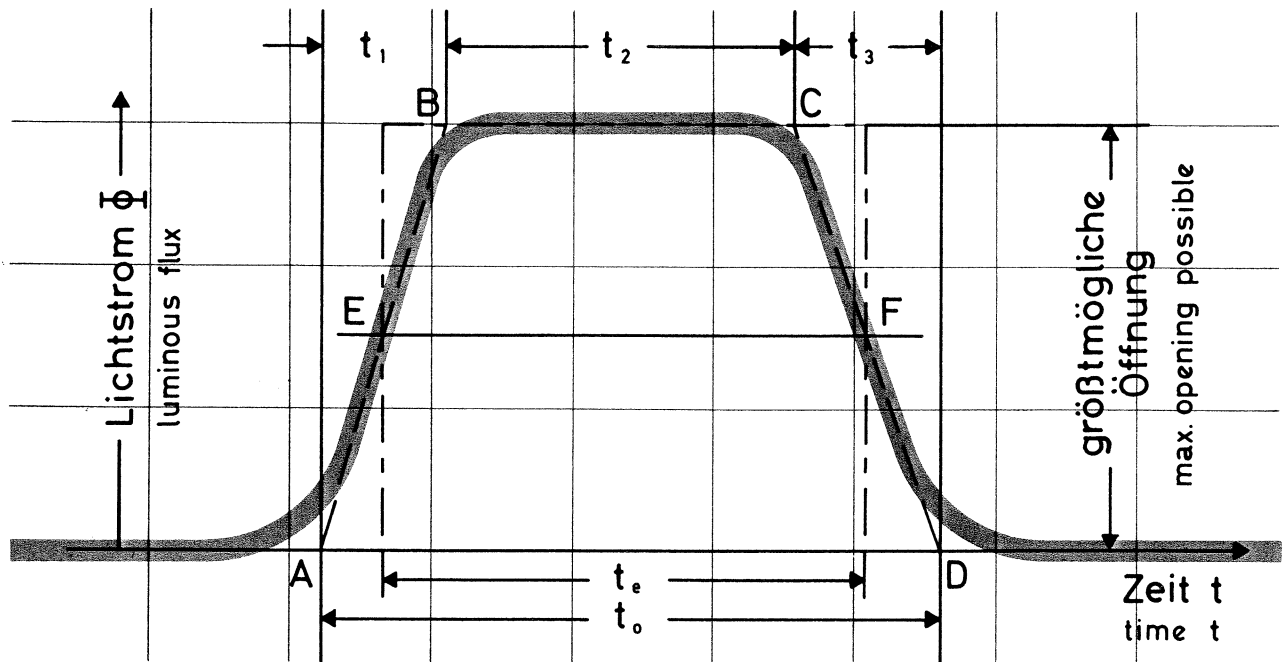
In a classic field of application calling for most precise exposure control - viz. photography - the between-the-lens shutters made by COMPUR and PRONTOR have proven themselves millions of times in the course of decades. The advanced stage of development and sophisticated manufacturing techniques are the basis for confidence in the application of these high-precision units to many present and future problem areas. The COMPUR PRONTOR assortment of between-the-lens shutters is that line in the world market which offers the greatest variety of models.

The quantity of light emitted by a light source and striking a photo receiver depends on the intensity of radiation as well as on the duration of the effect. Both magnitudes can be influenced by the between-the-lens shutters, i.e. determined within a specific range.

A between-the-lens shutter is a unit having a circular light passage which in unoperated position is covered light-tight by blades (very thin metal blades, mostly 5 pcs.) When the shutter is actuated, these blades swing concentrically from the center outward and open the light passage for a pre-set period after which they cover it again light-tight. Thus the extent of the duration of effect is obtained.

The blade system is normally provided with an aperture consisting of metal blades (5 to 10 pcs.) which permits a concentric reduction of the light passage from the outside by setting a corresponding value on the shutter. In this case, the light passage becomes a regular polygon (pentagon to decagon). By this arrangement the light intensity can be changed - mostly by the additional use of optical means.

A special version of the between-the-lens shutter is designed so that the shutter blades open the light passage in unoperated position whereas they close it for the pre-set period when the shutter is actuated, and thereafter open again (inverted function).



The total time which the light requires for passing through the shutter is composed of three time periods namely opening time t_1 , full open time t_2 and closing time t_3 . Their sum is the total time t_0 . The luminous flux / time diagram gives these time periods. The light quantity below the curve path determines the exposure time. For evaluation purposes the area below the curve path is determined and transformed to an ideal curve of same height and same area but with vertical ascent and descent, i.e. opening and closing time = zero. The result is the effective exposure time t_e which begins during the opening operation when the opening area is half-opened and ends when the area is half-closed again during the closing operation.

The speeds which can be set on the shutter are graduated according to DIN 19015. Speeds faster than 1 sec. are not expressed in fractions but in round numbers of the denominator in 1/sec. So, the scale gives for the shutter speeds faster than 1 sec. only the figures of the denominator, for example: $125 = 1/125$ sec.

Example of a scale: 1, 2, 4, 8, 15, 30, 60, 125, 250, 500. The length of the time periods t_1 and t_3 depends on the opening diameter and the speed of the shutter blades. In case of the same shutter they remain unchanged for all shutter speeds. Only the full open time t_2 varies.

The specification DIN 19015 also gives the admissible tolerances of the shutter speeds. Should the exposure time be controlled electronically, considerably closer tolerances are specified particularly with regard to the slower speeds. More detailed information on tolerances and time periods is available upon request.

Size and opening diameter Kinds of drive and shutter speeds

page 4

A main characteristic when selecting a between-the-lens shutter is the diameter of the light passage. The various sizes have the following opening diameters:

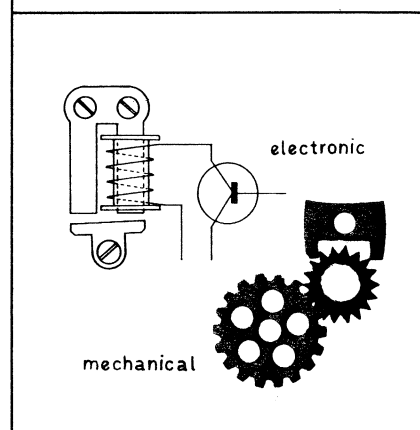
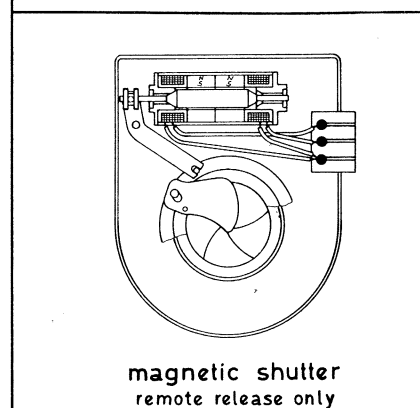
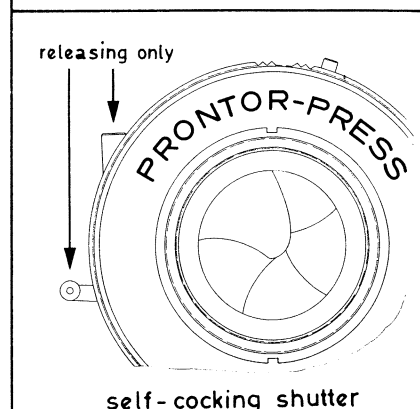
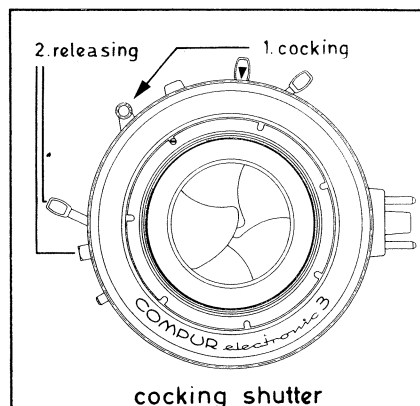
Size 0	23 or 24 mm diam.
Size 1	29 or 30 mm diam.
Size 3	40 mm diam.
Size 5	64 mm diam.

The external dimensions of the shutters increase accordingly.

Kinds of drive and shutter speeds

The cocking shutter (sizes 0, 1 and 3) requires a manual cocking operation by release of an external lever prior to its actuation which is effected via lever or cable-release. Fastest shutter speeds attainable are 1/500 sec. (sizes 0 and 1) and 1/200 sec. (size 3). Cocking by motor has been achieved only for size 5. The self-cocking shutter (sizes 0 and 1) is actuated in a single motion by means of an actuation handle. It is cocked mechanically first and then released at the end of the actuation stroke. The exposure is effected either by release of an external lever or by means of a cable-release. Fastest shutter speed attainable: 1/125 sec.

The magnetic shutter (all sizes) has powerful electromagnets for driving the shutter blades. This type of drive permits a remote control. Fastest shutter speeds are 1/125 sec. (sizes 0, 1 and 3) and 1/60 sec. (size 5).



COMPUR PRONTOR

*electronic -
magnetic*

VERSCHLUSS - SYSTEME
SHUTTER SYSTEMS
SYSTÈMES D' OBTURATEURS



Magnetic shutter system
COMPUR electronic-m

Z 3704
page 1

The shutter

The normal uses for photographic shutters are in cameras, but apart from this, photographic shutters can be successfully used for any other purpose where the length and intensity of light must be controlled.

Between-lens-shutters are mainly used for this purpose. Shutters in the COMPUR Electronic- m range can also be used in photography in the same way as shutters with the usual form of mechanism, but are mainly developed for use in the control of light for technical purposes.

The COMPUR Electronic- m is a between-lens-shutter, this means that a round opening through which light can pass is covered by 5 lightproof sectors when the shutter is not in operation. During use these sectors swing concentrically from the middle outwards and allow light to pass through the aforementioned opening for a determined length of time and afterwards, close, again becoming lightproof. The shutter can also be used with inverted functions. This means, that the shutter can be open when not in operation and closed when in operation, by an adjustment of the control device.

The shutters can be delivered in 4 different sizes.

size 0 with aperture diam. 24 mm	order no. 1 018 009
size 1 with aperture diam. 29 mm	order-no. 1 141 009
size 3 with aperture diam. 40 mm	order-no. 1 142 002
size 5 with aperture diam. 64 mm	order-no. 1 143 004

The outside measurements of the shutters are also proportionately different. Exact details are enclosed in the attached information sheets Nos. 018, 141, and 142 and 143.

An Iris-diaphragm is assembled in each size of shutter. Its largest aperture diameter is in each case equal to the size of the relativ shutter-blades. The smallest obtainable aperture also differs according to the shutter size. This information can be obtained from the information-sheet. The diaphragm is set manually, but the plastic scale-plate for the iris aperture is not engraved with f stops on standard models. If, when ordering, details are given on a lens which is to be built into the shutter, it is possible to deliver scale-plates engraved with the correct values should the quantities required make this economical.

These shutters can also be delivered in all sizes without iris diaphragm. All other features remain unchanged.

The order-nos. of shutters without iris diaphragms are:

Size 0	order-no. 1 018 012
Size 1	order-no. 1 141 012
Size 3	order-no. 1 142 014
Size 5	order-no. 1 43 016

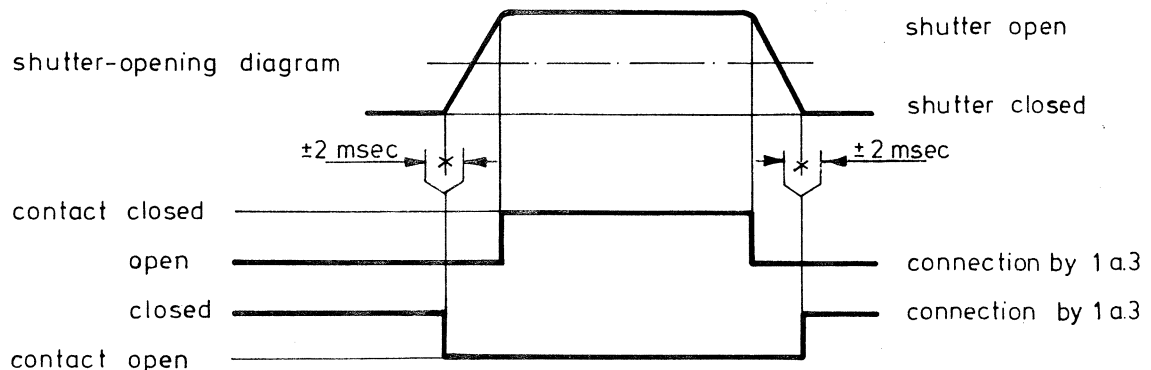
The lens-thread and holding-thread on the shutter are the same as the threads on existing mechanically driven shutters of the same sizes. Exact measurements are contained in the information leaflets. The shutter has a plate for soldering connections with 7 soldering positions. The connection number code given in the information leaflet is applicable to all shutter sizes.

Connections 1-3 are not necessary for the control of the shutter. They are used to control external operations which must take place simultaneously to the shutter operation. For example, a flash-attachment or reporting-feature on the working condition of the shutter. A switch for these three connections is inside the shutter which has the following positions:

shutter closed - contact 1-2 closed
 contact 1-3 open

shutter open - contact 1-2 open
 contact 1-3 closed

contact funktion and shutter opening



Magnetic shutter system COMPUR electronic-m

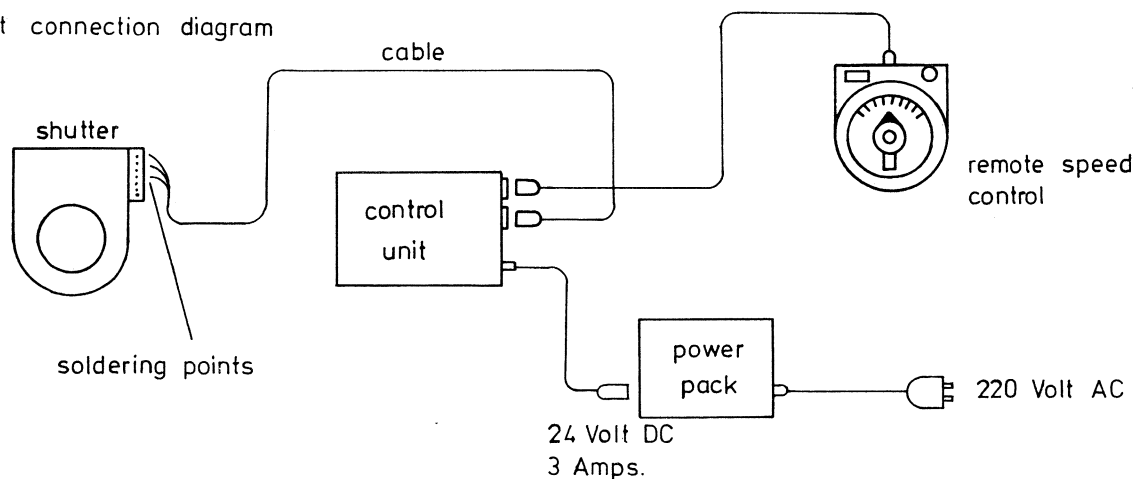
Z 3 704

page 3

Thus connection 1 and 3 comply with the normal flash contacts with X-synchronisation of DIN 19015. Connections 4 and 5 respectively control and power contacts of the shutter. Below is described how one connects to the soldering points.

The COMPUR-electronic-m has electro-magnets to drive the shutter blades which must be loaded with voltage impulses of a definite sort. This source of power is provided in the most suitable form, when the accessories specially developed from this kind of shutter, are used. The following drawing showing the method of connection for these accessories illustrates the correct assembly step by step. The table gives the model number for ordering. Please note that cable and the transformer/converter (power pack) are the same for all models and so interchangeable whereas the control unit and time setting device (speed control) are different for each size of shutter.

Attachment connection diagram



	shutter	cable	control unit	power pack	speed control
size 0	1 018 009 (1233)	1,5 m = 1 169 009	1 157 004	1 156 002	1 161 002
size 1	1 141 009 (1333)		1 158 006		1 162 004
size 3	1 142 002 (1533)	3 m = 1 169 012	1 159 008		1 163 006
size 5	1 143 004 (1733)		1 160 009		1 164 008

Accessories are individually described below.

Magnetic shutter system
COMPUR electronic-m

Z 3 704

page 4

The operation of the electro magnets together with the aperture size determines the fastest possible speed of the shutter. The relative speeds are:

size 0	order-no. 1 018 009 = 1/125 sec.
size 1	order-no. 1 141 009 = 1/125 sec.
size 3	order-no. 1 142 002 = 1/60 sec.
size 5	order-no. 1 143 004 = 1/30 sec.

The slowest speed depends on the layout of the control unit used with the shutter. If one operates the shutter with the standard accessories listed in the table on page 3, then the slowest shutter speed for each of the models is 32 seconds. The speeds must be set externally.

The order of operation (number of actions per time unit) depends on the load on the drive magnets as well as the control switch. Accurate values are possible by using the standard accessories. The shortest possible time between exposures for each model is as follows:

model 1 018 009 = 2 sec.
model 1 141 009 = 2 sec.
model 1 142 002 = 0,5 sec.
model 1 143 004 = 0,5 sec.

If the shutter is not operated with standard accessories the following minimum times between exposures are necessary when the maximum allowable control impulse of 50 ms is used.

model 1 018 009 from 4 sec.
model 1 141 009 from 4 sec.
model 1 142 002 from 1 sec.
model 1 143 004 from 1 sec.

Accessories

PRONTOR offer the control units for the COMPUR electronic shutters as separate single units, not combined with the shutters. This makes the units much more versatile and allow for easier assembly. A complete list of accessories appears in the table on page 3. This also shows the mode of connection of the units. A description of each item follows.

Magnetic shutter system
COMPUR electronic-m

Z 3 704
page 5

The cable

The cable connecting the shutter to the control device is available in lengths of 1,5 metres and 3 mtrs. They can be used for all shutter sizes. The multiple plug fits the relevant plug in the control device. The loose cable ends are to be soldered on to the shutter. There are two colour combinations and they are of the same value and fully interchangeable. These are therefore not separately identified with order numbers. The following order must be maintained.

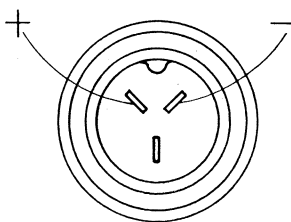
connection no. on the shutter	cable colour 1. colour	cable colour 2. colour
4	white	white
5	green a. yellow (coupled)	greenyellow a. yellow (coupled)
6	pink	black
7	brown a. grey (coupled)	brown a. blue (coupled)

The connections 4 and 6 must also be bridged. The connection numbers on the shutters can be seen on the relative information sheets. The numbers for models no. 1 018 009, 1 141 009 and 1 142 002 run from top to bottom, but by model no. 1 143 004 from bottom to top. The connections are on the right hand side of the first 3 shutters mentioned and on the left of the latter shutter, looking from the front.

Control unit

For completion of control unit
please refer to pages 10 and 11

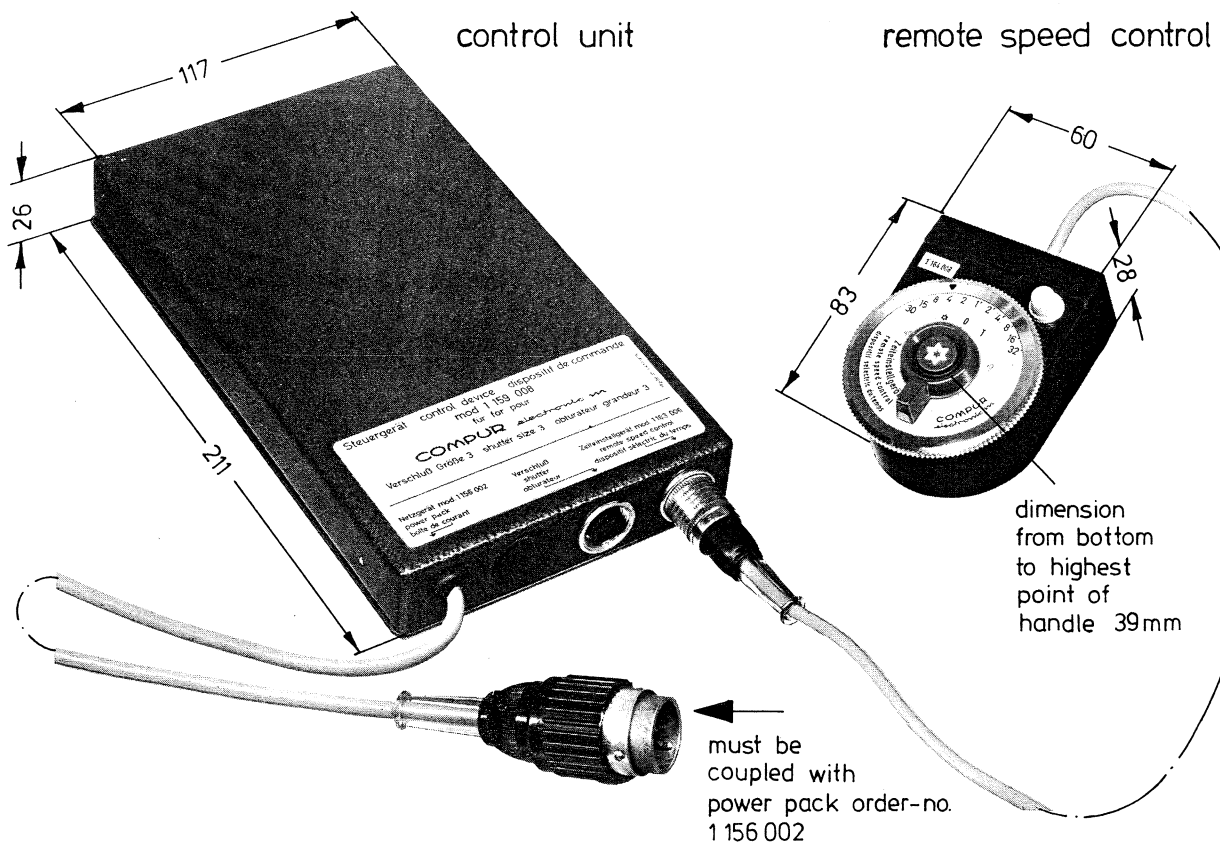
A different control unit is used with each different size of shutter as the most suitable type of electric control impulse and entry values of the magnet spools have been taken into consideration for each relevant shutter. (See table for order numbers) Each device looks the same and can only be identified by the name-plate. The order number and shutter size is on the name-plate. This also shows the position of the connections. The cable of the power pack is fixed to the control unit, and is 2 metres long. Should the transformer not be used because of another source of 24 Volt D.C., then the cable should be connected as per sketch (view of plug opening). Power taken is about 3 Amps.



Magnetic shutter system
COMPUR electronic-m

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page 6

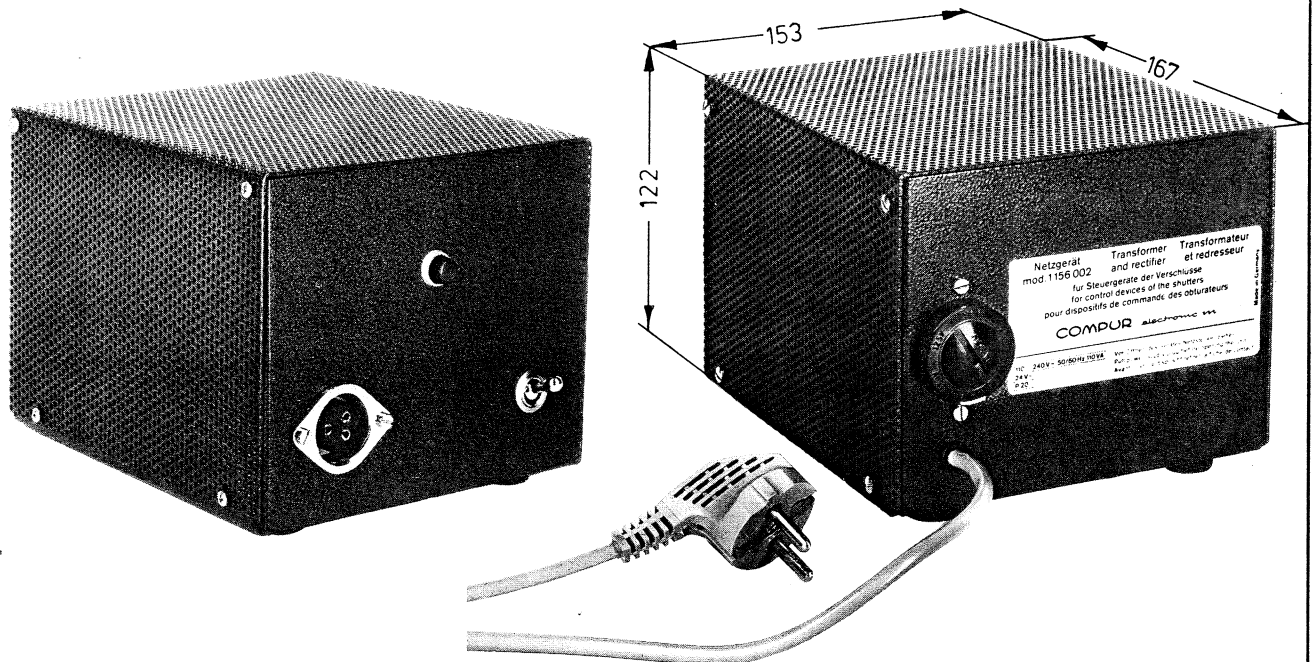


Magnetic shutter system
COMPUR electronic-m

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page 7

In the middle of the " setting " scale of the e.t.s.d. is a release button with a star sign. After pressing this button the shutter will be released after the previously set time has elapsed but only if the switch control, which is the method of release, is also set to the star sign. This switch has two further positions " Null " which indicates that the shutter and control device are switched off, and " T " in the position the shutter remains open until the switch is moved to " Null ". When the shutter is open whether on " T " or by way of a definite setting, a yellow signal lights up. The connection cable to the control device is fixed to the e.t.s.d. and is 3 m long.

The power pack



The power pack order no. 1 156 002 can be used with all the C-m-shutters. It converts to 24 V d.c. and is to be plugged in to the mains supply. On delivery the power pack is set to 220 Volts. The built-in voltage-choice switch permits setting to 240 V, 150V and 110 Volts., Adjustment can be made by a coin.

The voltage-choice feature also includes the fuse which springs out when the setting is at 0. The power pack has an on/off switch and a red control light.

The main dimensions are given in the drawing. The cable is 2 m long.

Control data

On page 3 of these instructions it is shown that the maximum use of the COMPUR-electronic-m shutter is achieved when using the accessories especially developed by PRONTOR. In special cases however it is possible that the user can use his own device for the shutter, because the necessary impulses are readily available from or can easily be made available from the controlling instrument into which the shutter is to be intergrated. In this case, the following instructions for operating the shutter are to be observed. The means of soldering the contacts onto the shutter were described on page 5 when they are used with standard accessories. The following are valid when the user provides his own control:

contact no. 4 = +) for opening impulse
contact no. 5 = -) (impulse length t 6)

contact no. 6 = +) for closing impulse
contact no. 7 = - (impulse length 7 t)

The operating current is 24 Volts, when taking in approximately 3 Amps. The maximum length of impulse must not exceed 50 ms. The most suitable impulse data and resulting " reaction-times " of the shutter differ from size to size. The resulting values from our experiments are given in a table on page 9, the means and the extent to which they depend on each other can be seen in the corresponding diagram.

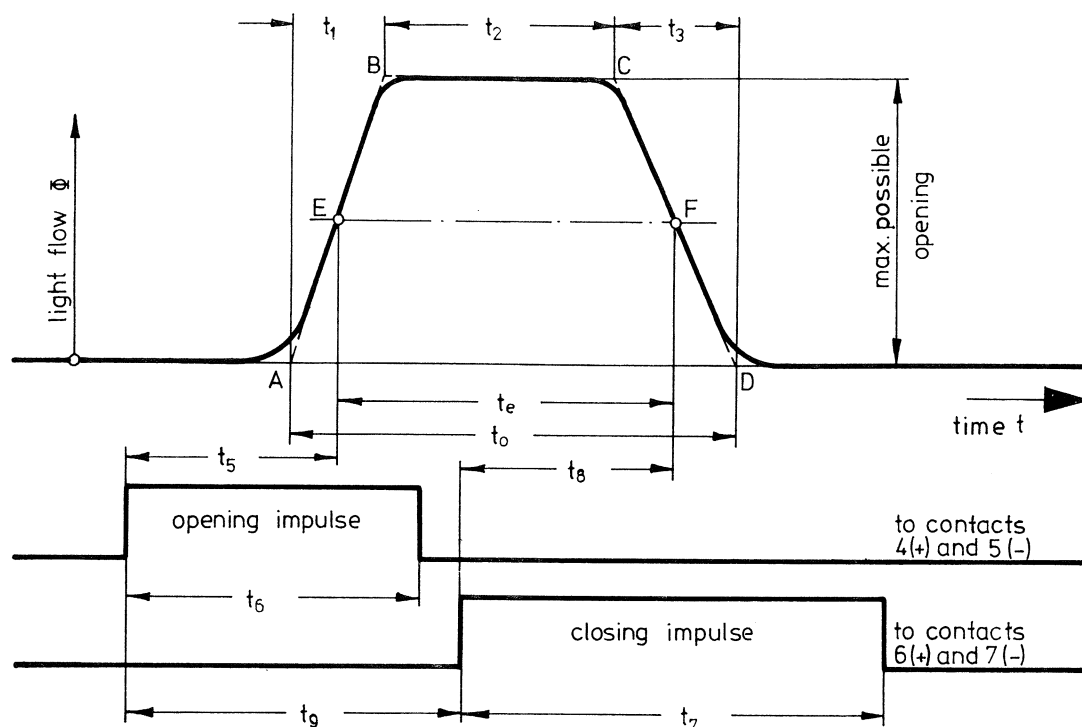
t₀ = total time of the opening operation
t_e = effective time
t₁ = opening time
t₂ = open time
t₃ = closing time
t₅ = opening delay
t₆ = length of opening impulse
t₇ = length of closing impulse
t₈ = closing delay
t₉ = difference of time of the switching on
points for opening and closing impulse.

The opening and closing delay are referred to on the effective points E and F of the light-flow/time diagram. They are important for technical measuring reasons. These points can be exactly defined as the starting points of the opening and closing times.

Magnetic shutter system COMPUR electronic-m

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page 9



shutter			values on shutter				impulse times			
order no.	aperture size		effective time t_e (sec.)	opening time t_1 (msec.)	open time t_2 (msec.)	closing time t_3 (msec.)	opening delay t_5 (msec.)	opening impulse t_6 (msec.)	closing impulse t_7 (msec.)	impulse distance t_9 (msec.)
1 018 009	0	24	$1/125$	2,8	2,1	3,1	5,5	8,5	12,0	8,5
1 141 009	1	29	$1/125$	2,9	4,6	3,5	5,8	8,5	13,0	9,2
1 142 002	3	40	$1/60$	6,0	4,4	5,2	11,0	15,2	20,0	16,3
1 143 004	5	64	$1/30$	14,0	23,0	16,0	38,0	32,0	45,0	35,5

The given effective time is the shortest possible in each case, longer effective times can be achieved by lengthening the distance between impulses t_9 . The times t_e , t_0 and t_2 are then lengthened by a corresponding amount.

If the shortest exposure times t_e in the table are not required, the operating current can be reduced from 24 to 18 Volts. The impulse times t_6 and t_7 are then lengthened for this purpose. They cannot however exceed 50 ms. With reference to t_6 , this impulse cannot be lengthened by a longer time value than the effective time extension shown in the table.

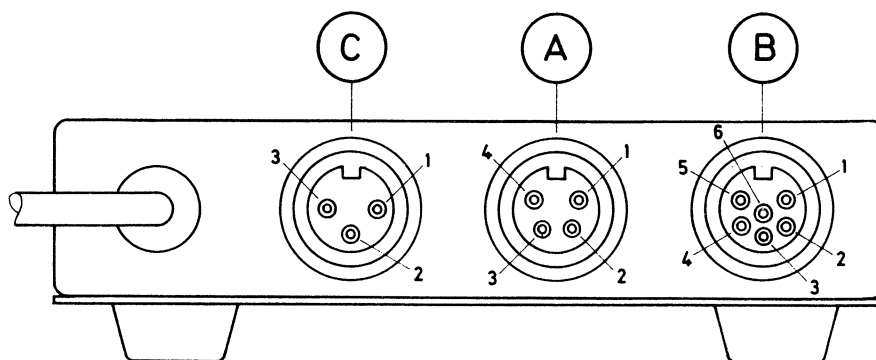
Pulse control

In the meantime the control unit pictured on page 6 has been completed so that the shutter functions can be controlled by external pulses. For this purpose the control unit has been equipped with another socket which is located at that point where the picture on page 6 shows a plastic cover. Its exact location and the designation of its poles are evident from the sketch below.

Basically two kinds of external control are possible:

When the remote speed control is connected, the shutter function is released by applying a pulse to poles 1 and 2 (2 = ground) of socket C. This causes the start, i.e. the opening of the blades. The opening delay given on page 9 hereby increases by 1 ms, measured from the start of the external pulse till the effective point E of the blade opening motion is reached. The open time t_e of the shutter is still determined by the setting of the connected remote speed control.

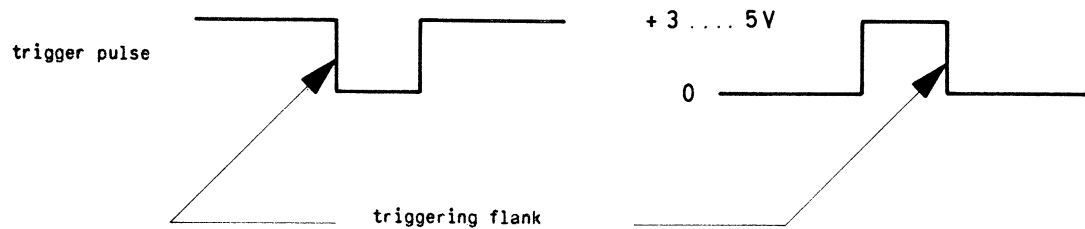
In case of the second method of operation the remote speed control is not connected. The opening of the shutter is effected in the same way as described under the first method of operation (pulse applied to poles 1 and 2 of socket C. But with this method of operation the shutter remains opened till another pulse is applied to the poles 2 and 3 (2 = ground) of the socket C. Again the closing delay t_g given on page 9 increases by 1 ms.



- A** connection to shutter by cable 1 169 009 resp. 1 169 012 or:
1 to soldering point 6 of shutter 2 to soldering point 4 of shutter
3 to soldering point 5 of shutter 4 to soldering point 7 of shutter
- B** connection to remote speed control according to page 6 or:
1 and 2 to release contact (simple closing contact, may be omitted in case of pulse control)
3 and 4 to time resistor or potentiometer (may be omitted in case of pulse control of second method of operation)
5 and 6 to lamp 12 ... 15 V / 1 W (indication of open time, if required)
- C** pulse inputs for external control:
1 for the opening pulse - 2 for ground - 3 for the closing pulse

The negative pole of the pulse voltage source should be applied to socket 2 (ground). The voltage may be 3 to 5 Volts.

The triggering is effected by the falling flank of a pulse being directed from + 3 ... 5 V to 0. The drop should take place within 1 μ s.

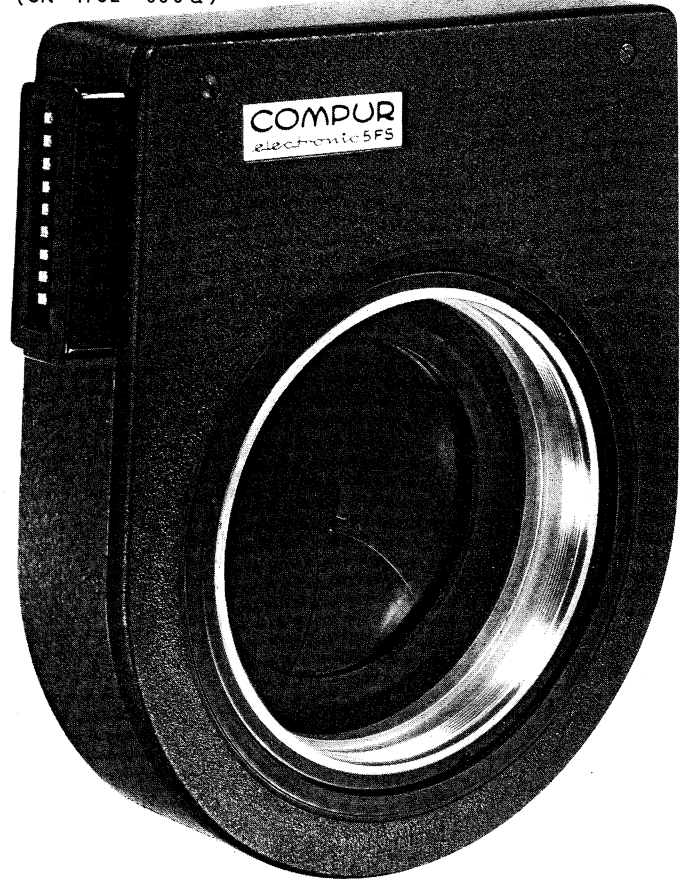
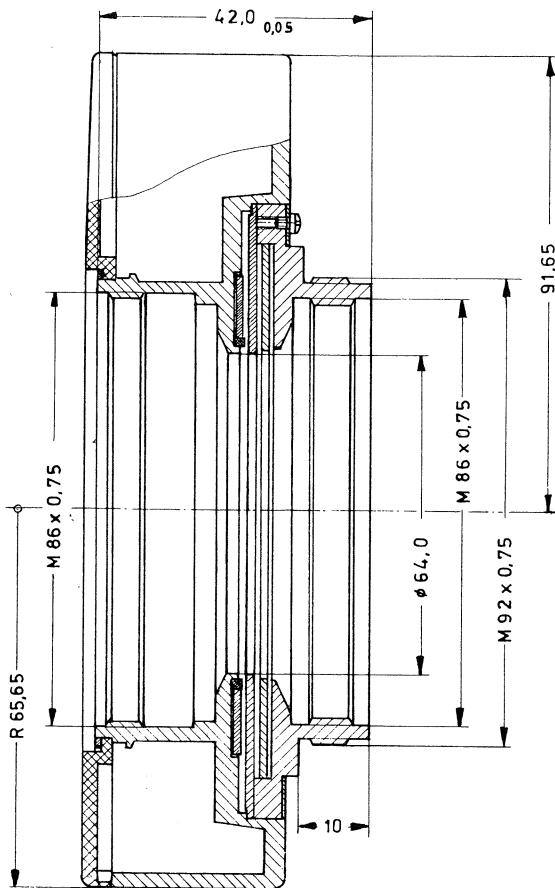


The opening pulse may outlast the starting point of the closing pulse without affecting the function.

Remark:

The word "ground" on pages 10 and 11 should be replaced by "return wire".

The word "device" as used on page 5 naturally means the control unit.

Order No. 1138 004 Bestell - Nr. 1138 004 (CN-1732-000 a)
(CN-1732 - 000 a)Belichtungszeiten
BlendeExposure times
Diaphragm

32	16	8	4	2	1	1/2	1/4	1/8	1/15	1/30	1/60
Größte Öffnung Maximum aperture Ø 64											
Kleinste Öffnung Minimum aperture Ø 4,0											
42,0 ± 0,05 mm											

Gesamthöhe
(Abstand der Objektivrohr-
Stirnflächen)Total height
(Distance between the front and
the rear faces of the nozzle)

Gehäuselänge

Length of housing

Fassungsgewinde vorn

Front lens mounting thread

Fassungsgewinde hinten

Rear lens mounting thread

Anschraubgewinde

Thread of retaining ring

Betriebsspannung

Operating voltage

Kürzeste mögliche Belichtungszeit

Shortest possible exposure time

Zusatzgeräte

Accessory instruments

Fernsteuergerät

Remote-control unit

Verbindungskabel

Connection cable

1,5 m

1,5 m

4 m

4 m

10 m

10 m

Fernauslösekabel

Remote release cable

4 m

4 m

10 m

10 m

Netzgerät

Transformer and rectifier

157,6 ± 0,8

M 86 x 0,75

M 86 x 0,75

M 92 x 0,75

9 V

1/60 s

Bestell - Nr. Order - No. 1139 018

Bestell - Nr. Order - No. 1167 005

Bestell - Nr. Order - No. 1167 017

Bestell - Nr. Order - No. 1167 029

Bestell - Nr. Order - No. 1168 007

Bestell - Nr. Order - No. 1168 019

Bestell - Nr. Order - No. 1166 003

Zum Betrieb des Verschlusses sind das Fernsteuergerät (batteriebestückt) und ein Verbindungskabel notwendig. Ferngesteuert werden die Funktionen: Belichtungszeiteinstellung (elektronisch gesteuert), Blendeneinstellung (max. 9 volle Stufen, in 1/3 Stufen gerastet), Spannen, Auslösen, T-Funktion, Blenden- und Sektorenöffnungseinrichtung. Steckbuchse für Verbindungskabel und Blitznippel für X-Kontakt am Verschluss

The remote-control unit (with battery) and connection cable are inevitable for actuating the shutter. The following functions are remote-controlled: speed setting (electronically controlled), aperture setting (max. 9 full values, with click stops at 1/3 intervals), tensioning, releasing, "T" setting, diaphragm and blade opening.

The shutter is provided with a plug socket for the connection cable and a flash terminal for the X contact.

Für Maße und Daten sind nur Angaben der Originalzeichnung 1 138 004 verbindlich
For dimensions and other data original factory drawing 1 138 004 is available

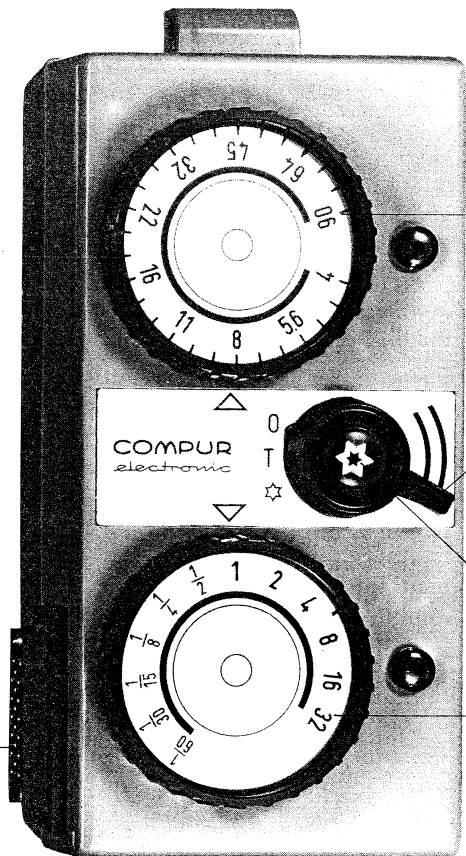
Fernsteuergerät für COMPUR electronic 5FS
 Remote Control Unit for COMPUR electronic 5FS
 Boîte de télécommande pour COMPUR electronic 5FS

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Blatt 2 / page 2

Steuergerät Bestell-Nr. 1 139 006
 Remote Control Unit Ref. No. 1 139 006
 Boîte de Télécommande Réf. No. 1 139 006

Netzgerät 220 V~/9V= Bestell-Nr. 1 166 003
 Power Pack 220 V A.C./9 V D.C. Ref. No. 1 166 003
 Bloc d'Alimentation C.A. 220 V C.C. 9 V Réf. No. 1 166 003



Blendeneinstell-
knopf
aperture selector
dial
sélecteur d'
ouverture

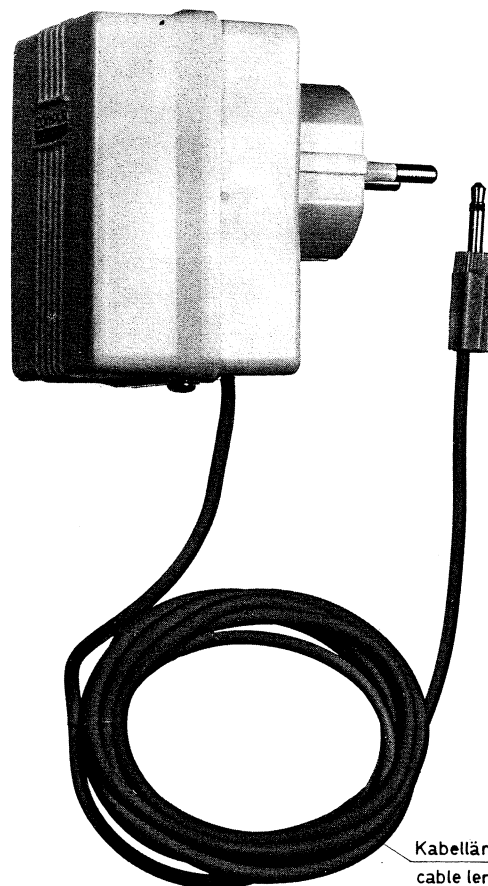
Wahlschalter
selector switch
commutateur
sélectif

Auslösetaste
release button
bouton de
déclenchement

Zeiteinstellknopf
speed selector
sélecteur de
vitesse

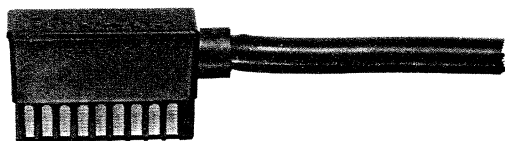
2/3 natürliche Größe
 2/3 of full size
 2/3 de la grandeur naturelle

Anschluß für Verbindungskabel
 connection for junction cable
 prise pour câble de raccord



Kabellänge 1,5m
 cable length 1,5m
 longueur du
câble 1,5 m

Steckverbindung für Netzgerät
 socket for power pack
 connexion enfichable pour bloc d'alimentation



Verbindungskabel Längen und Bestell-Nr. auf 138 Bl. 1
 junction cable available lengths and ref.nos. see 138 page 1
 câble de raccord longueurs livrables et réf.nos. voir 138 page 1



Fernauslösekabel Längen und Bestell-Nr. auf 138 Bl. 1
 remote release cable available lengths and ref.nos. see 138 page 1
 câble de déclenchement à distance longueurs livrables et réf.no. s voir 138 page 1



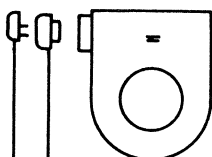
COMPUR electronic 5 FS
COMPUR electronic 3
COMPUR electronic 1

Z 3697
Blatt 3

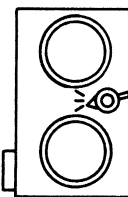
Verschluß / shutter
obturateur
COMPUR electronic 5 FS
1 138 004

Fernsteuergerät
remote-control unit
boîte de télécommande
1 139 006

Batteriebestückung:
capacity of battery:
capacité de pile:
6 Stck/pcs. Pertrix 281
insges. / total 9 V



Verbindungskabel 1,5 m 1 167 005
connecting cable 4 m 1 167 017
câble de connexion 10 m 1 167 029



Fernauslösekabel
remote-release cable
câble de déclenchement à distance
4 m = 1 168 007
10 m = 1 168 019

Netzgerät 9 V
power pack
bloc d'alimentation
1 166 003

Bei Anschluß des Netzgerätes ist
der Batteriesatz abgeschaltet.
When connecting the power pack,
the battery set is disconnected.
Quand le bloc d'alimentation est
raccordé le jeu de piles est
déconnecté.



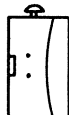
Verschluß / shutter
obturateur
COMPUR electronic 3
1 134 005

Dazu wahlweise:
optional accessories:
accessoires facultatifs:

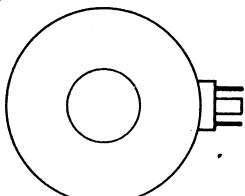
Verschluß / shutter
obturateur
COMPUR electronic 1
1 131 008



Batteriebehälter ohne Check
battery container without check
boîtier de pile sans contrôle
électrique de pile
1 136 009



Batteriebehälter mit Check
battery container with check
boîtier de pile avec contrôle
électrique de pile
1 136 024



Batterie / battery / pile: 4,5 V
z.B. Mallory PX-21
e.g. Mallory PX-21
par exemple: Mallory PX-21



Netzgerät 4,5 V
power pack 4,5 V
bloc d'alimentation 4,5 V
1 136 012



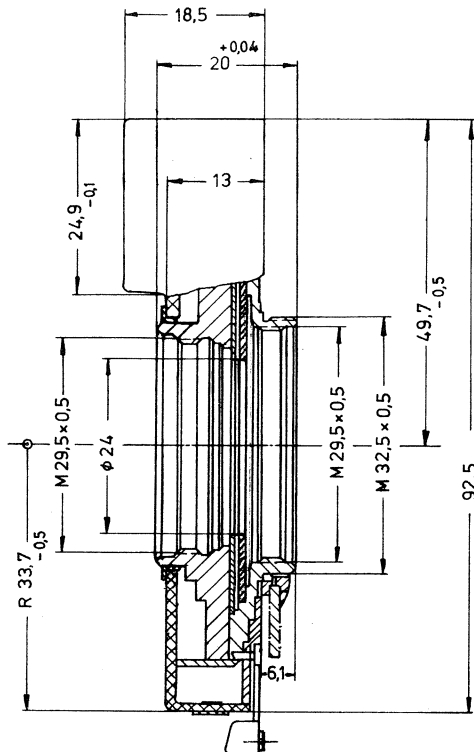
COMPUR electronic - m Verschlußgröße 0

COMPUR electronic - m Shutter size 0

018

Order No. 1 018 009
(CN 1233-000)

Bestell-Nr. 1 018 009
(CN 1233-000)



Connection
No.

Anschluß -
Nr.

Belichtungszeiten	Exposure times	32 16 8 4 2 1 1/2 1/4 1/8 1/15 1/30 1/60 1/125
Blende	Diaphragm	Größte Öffnung Maximum aperture φ 24 mm Kleinste Öffnung Minimum aperture φ 15 mm
Gesamthöhe (Abstand der Objektivrohr-Stirnflächen)	Total height (Distance between the front and the rear faces of the nozzle)	20 ^{+0,04} mm
Gehäuselänge	Length of housing	92,5 mm
Fassungsgewinde vorn	Front lens mounting thread	M 29,5 x 0,5
Fassungsgewinde hinten	Rear lens mounting thread	M 29,5 x 0,5
Anschraubgewinde	Thread of retaining ring	M 32,5 x 0,5
Betriebsspannung	Operating voltage	24 V
Stromaufnahme	Current consumption	ca. 3 A
Kürzeste mögliche Belichtungszeit	Shortest possible exposure time	1/125 s
Ausführliche Beschreibung Maßzeichnungen	Detailed description Dimensions drawings	Z 3704 Blatt 1 bis 7 pages 1-7
Verschluß	shutter	1 018 009
Zusatzgeräte	accessory instruments	1 157 004

Magnetischer Antrieb (hohe Lebensdauer). Fernbedienung mittels Zeitsteuergerät. Elektronisch gesteuerte Verschlusszeiten. Manuell einstellbare Blende in 1/2 Intervallen gerastet.
Magnetic drive (long life). Remote speed control. Electronically controlled shutter speeds. Manually controlled aperture with click stops at 1/2 intervals.

Für Maße und Daten sind nur Angaben der Originalzeichnung 1018 009 verbindlich
For dimensions and other data original factory drawing 1018 009 is available

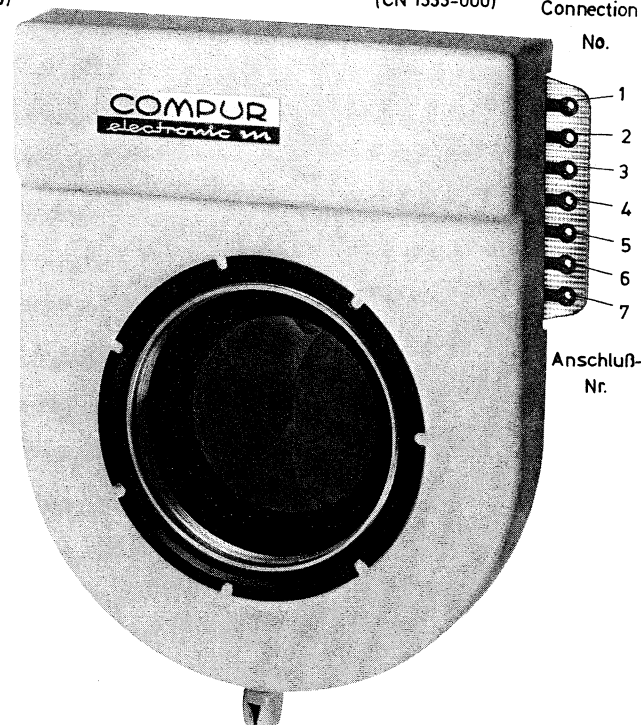
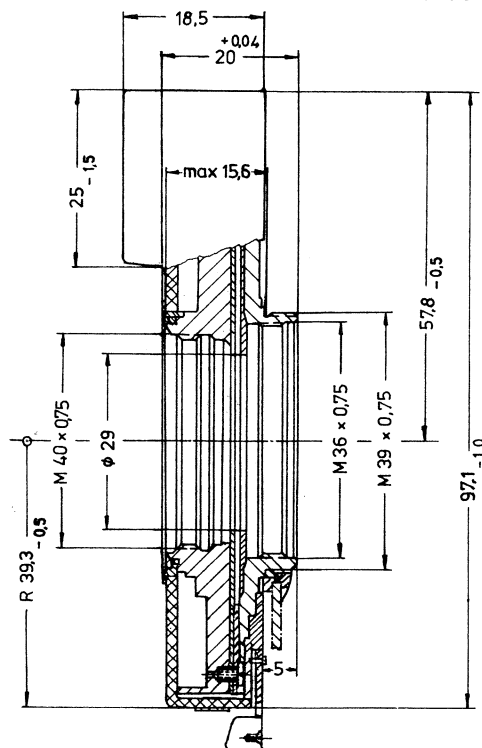
COMPUR electronic - m Verschußgröße 1

COMPUR electronic - m Shutter size 1

141

Order No. 1141 009
(CN 1333-000)

Bestell - Nr. 1141 009
(CN 1333-000)



Belichtungszeiten

Exposure times

32 16 8 4 2 1 1/2 1/4 1/8 1/15 1/30 1/60 1/125

Blende

Diaphragm

Größte Öffnung Maximum aperture ϕ 29 mm
Kleinste Öffnung Minimum aperture ϕ 15 mm

Gesamthöhe
(Abstand der Objektivrohr - Stirnflächen)

Total height
(Distance between the front and the rear faces of the nozzle)

20^{+0.04} mm

Gehäuselänge

Length of housing

97.1_{-1.0} mm

Fassungsgewinde vorn

Front lens mounting thread

M 40 x 0.75

Fassungsgewinde hinten

Rear lens mounting thread

M 36 x 0.75

Anschraubgewinde

Thread of retaining ring

M 39 x 0.75

Betriebsspannung

Operating voltage

24 V

Stromaufnahme

Current consumption

ca. 3 A

Kürzeste mögliche Belichtungszeit

Shortest possible exposure time

1/125 s

Ausführliche Beschreibung

Detailed description

Z 3704 Blatt 1 bis 7 / pages 1-7

Maßzeichnungen

Dimensions drawings

Verschuß

shutter

1 141 009

Zusatzgeräte

accessory instruments

1 158 006

Magnetischer Antrieb (hohe Lebensdauer). Fernbedienung mittels Zeitsteuergerät. Elektronisch gesteuerte Verschußzeiten. Manuell einstellbare Blende in 1/3 Intervallen gerastet.
Magnetic drive (long life). Remote speed control. Electronically controlled shutter speeds. Manually controlled aperture with click stops at 1/3 intervals.

Für Maße und Daten sind nur Angaben der Originalzeichnung 1141 009 verbindlich
For dimensions and other data original factory drawing 1141 009 is available

Ausgabe 6. 72 D + E

PRONTOR-WERK ALFRED GAUTHIER GMBH 7547 WILDBAD-5/SCHW.

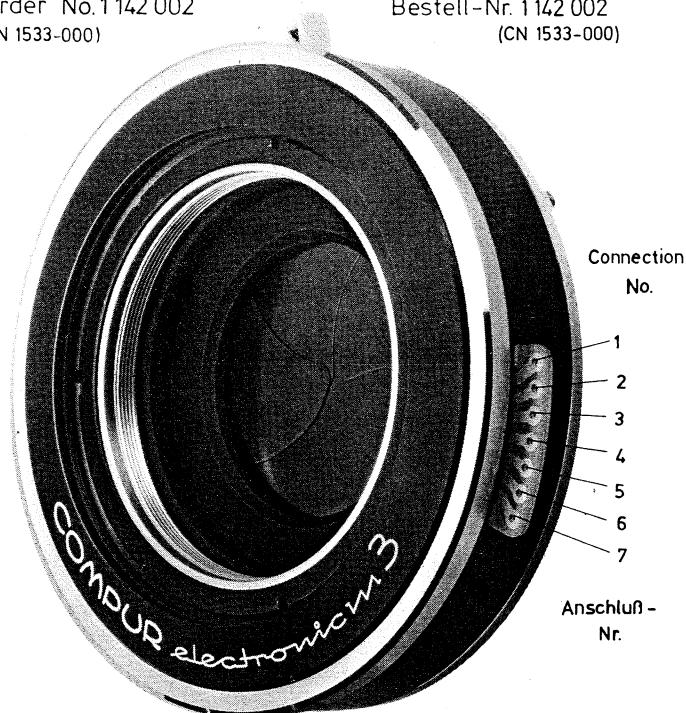
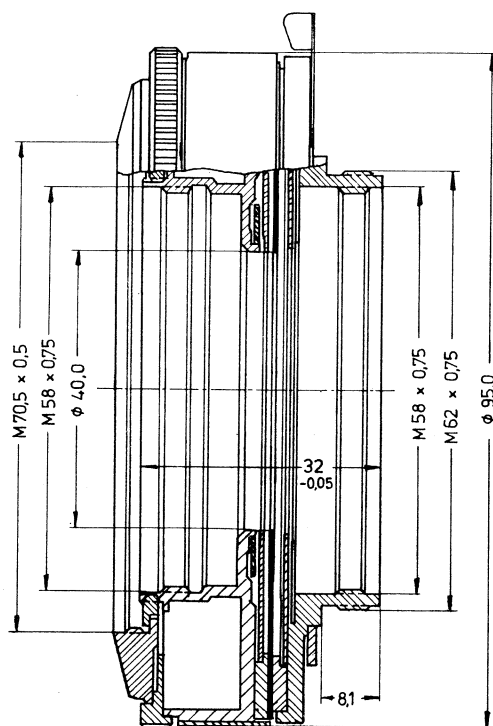
COMPUR electronic - m Verschußgröße 3

COMPUR electronic - m Shutter size 3

142

Order No.1142 002
(CN 1533-000)

Bestell-Nr. 1142 002
(CN 1533-000)



Belichtungszeiten

Exposure times

32 16 8 4 2 1 1/2 1/4 1/8 1/15 1/30 1/60

Blende

Diaphragm

Größte Öffnung Maximum aperture ϕ 40 mm
Kleinste Öffnung Minimum aperture ϕ 2,5 mm

Gesamthöhe

(Abstand der Objektivrohr-Stirnflächen)

Total height

(Distance between the front and the rear faces of the nozzle)

32 -0,05 mm

Gehäusedurchmesser

Housing diameter

95 mm

Fassungsgewinde vorn

Front lens mounting thread

M 58 x 0,75

Fassungsgewinde hinten

Rear lens mounting thread

M 58 x 0,75

Anschraubgewinde

Thread of retaining ring

M 62 x 0,75

Betriebsspannung

Operating voltage

24 V

Stromaufnahme

Current consumption

ca. 3 A

Kürzeste mögliche Belichtungszeit

Shortest possible exposure time

1/60 s

Ausführliche Beschreibung

Detailed description

Z3704 Blatt 1 bis 7 / pages 1-7

Maßzeichnungen

Dimensions drawings

Verschuß

shutter

1142 002

Zusatzgeräte

accessory instruments

1159 008

Magnetischer Antrieb (hohe Lebensdauer). Fernbedienung mittels Zeitsteuergerät. Elektronisch gesteuerte Verschußzeiten. Manuell einstellbare Blende in 1/3 Intervallen gerastet.

Magnetic drive (long life). Remote speed control. Electronically controlled shutter speeds. Manually controlled aperture with click stops at 1/3 intervals.

les 1/3 de division.

Für Maße und Daten sind nur Angaben der Originalzeichnung 1142 002 verbindlich.
For dimensions and other data original factory drawing 1142 002 is available

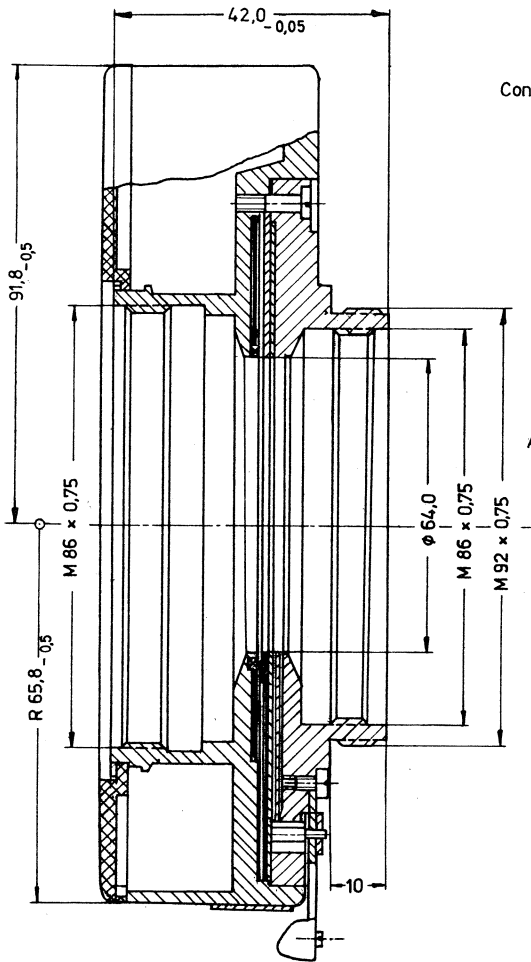
COMPUR electronic - m Verschußgröße 5

COMPUR electronic - m Shutter size 5

143

Order No.1143 004
(CN 1733-000)

Bestell-Nr. 1 143 004
(CN 1733-000)



Connection
No.

7
6
5
4
3
2
1

Anschluß-
Nr.



Belichtungszeiten
Blende

Exposure times
Diaphragm

32 16 8 4 2 1 1/2 1/4 1/8 1/15 1/30

Größte Öffnung Maximum aperture ϕ 64 mm

Kleinste Öffnung Minimum aperture ϕ 4 mm

42 -0,05 mm

Gesamthöhe
(Abstand der Objektivrohr - Stirnflächen)

Total height
(Distance between the front and the rear faces of the nozzle)

Gehäuselänge

Length of housing

157,6,08 mm

Fassungsgewinde vorn

Front lens mounting thread

M 86 x 0,75

Fassungsgewinde hinten

Rear lens mounting thread

M 86 x 0,75

Anschraubgewinde

Thread of retaining ring

M 92 x 0,75

Betriebsspannung

Operating voltage

24 V

Stromaufnahme

Current consumption

ca. 3 A

Kürzeste mögliche Belichtungszeit

Shortest possible exposure time

1/30 s

Ausführliche Beschreibung

Detailed description

Z 3704 Blatt 1 bis 7 / pages 1-7

Maßzeichnungen

Dimensions drawings

Verschuß

shutter

1143 004

Zusatzgeräte

accessory instruments

1160 009

Magnetischer Antrieb (hohe Lebensdauer), Fernbedienung mittels Zeitsteuergerät. Elektronisch gesteuerte Verschußzeiten. Manuell einstellbare Blende in 1/3 Intervallen gerastet.

Magnetic drive (long life). Remote speed control. Electronically controlled shutter speeds. Manually controlled aperture with click stops at 1/3 intervals.

Für Maße und Daten sind nur Angaben der Originalzeichnung 1143 004 verbindlich
For dimensions and other data original factory drawing 1143 004 is available

Ausgabe 6.72 D+E

Steuergerät für PRONTOR magnetic
Control device for PRONTOR magnetic
Dispositif de commande PRONTOR magnetic

017

Bestell-Nr. 1017 007
Ref. no. 1017 007
Réf. no. 1017 007

Fernbedienungskabel

wahlweise: 4 m lang, Best. Nr. 1172 005
10 m lang, Best. Nr. 1172 017

remote control cable

available lengths: 4 m ref. no. 1172 005
10 m ref. no. 1172 017

câble de télécommande

longeurs livrables: 4 m réf. no. 1172 005
10 m réf. no. 1172 017

Anschluß für Fernbedienungskabel

connection for remote control cable

prise du câble de télécommande

Netzanschluß

power supply

branchement au réseau

Auslösetaste

release button

bouton de déclenchement

Wahlschalter

selector switch

commutateur de sélection

Signallampe

signal lamp

lampe de signalisation

Belichtungszeiteinstellring

speed selector ring

bague sélectrice du temps de pose

Steckverbindung für Verschluss

socket for shutter

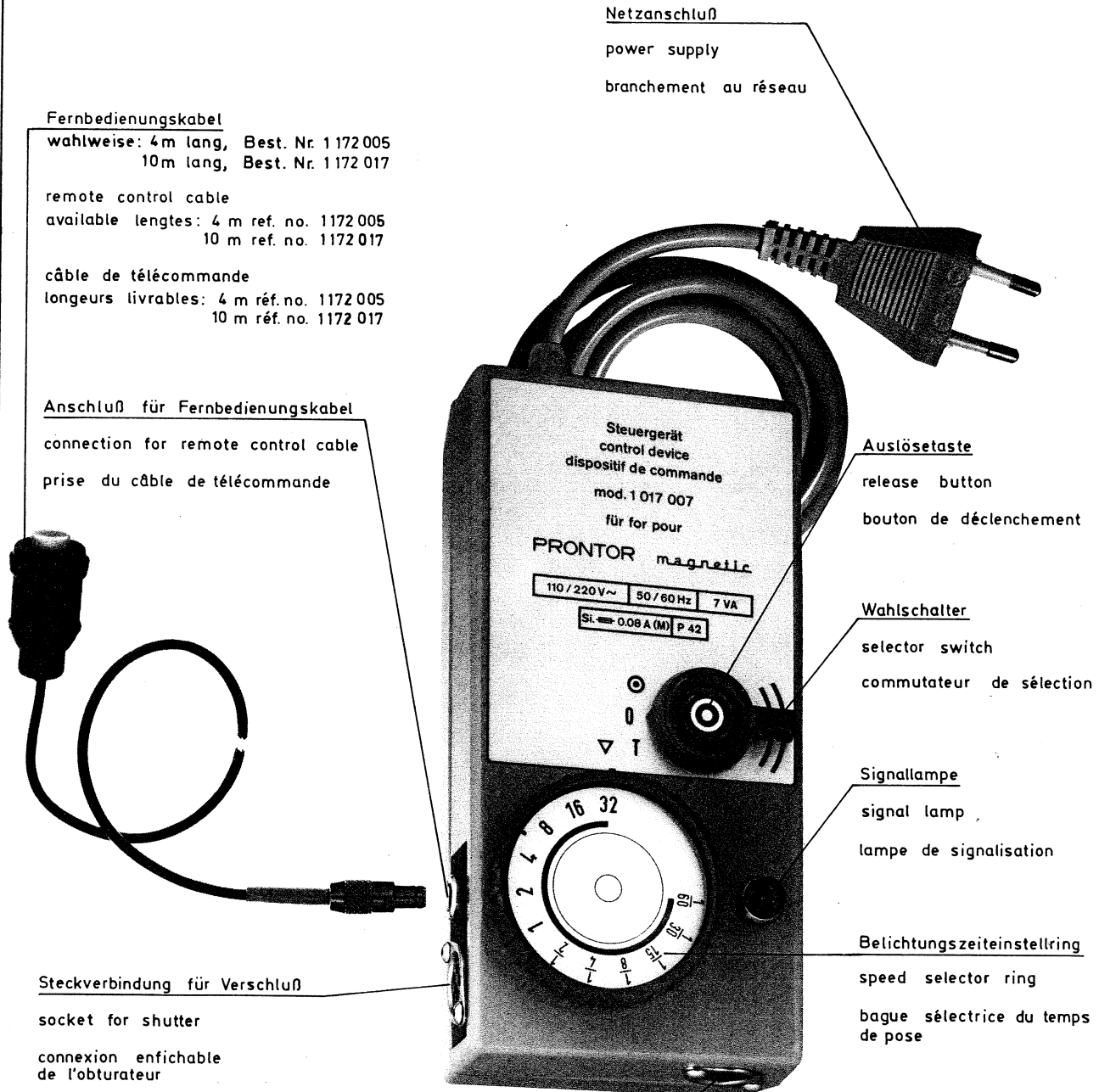
connexion enfichable de l'obturateur

Impuls - Eingang

externe Triggerung

pulse input
external triggering

entrée d'impulsions
déclenchement électrique extérieur

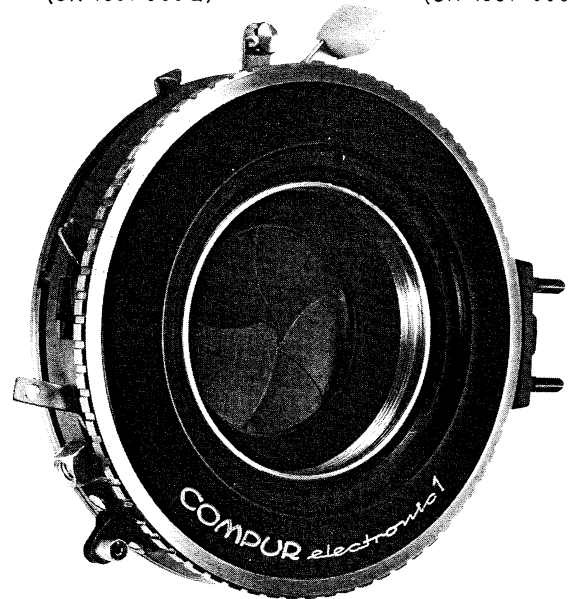
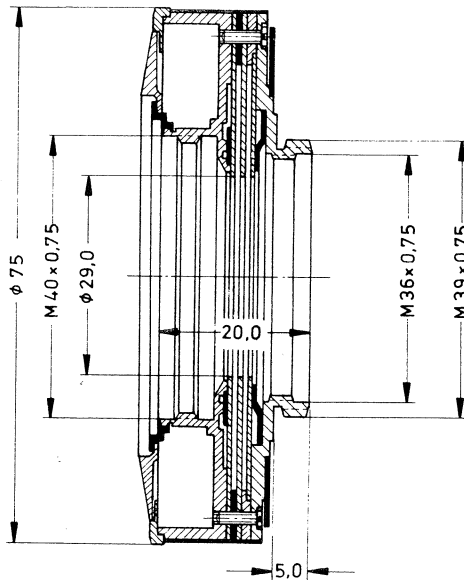


COMPUR electronic Verschußgröße 1
COMPUR electronic Shutter size 1

131

Order No. 1 131 008
(CN 1331-000 a)

Bestell-Nr. 1 131 008
(CN 1331-000a)



Belichtungszeiten	Exposure times	32 16 8 4 2 1 1/2 1/4 1/8 1/15 1/30 1/60 1/125 1/250 1/500 und T and T
Blende	Diaphragm	Größte Öffnung Maximum aperture ϕ 29 mm Kleinste Öffnung Minimum aperture ϕ 1,6 mm
Gesamthöhe (Abstand der Objektivrohr - -Stirnflächen)	Total height (Distance between the front and the rear faces of the nozzle)	20 ^{+0,4} mm
Gehäusedurchmesser	Housing diameter	ϕ 75,0 _{h9}
Fassungsgewinde vorn	Front lens mounting thread	M 40 x 0,75
Fassungsgewinde hinten	Rear lens mounting thread	M 36 x 0,75
Anschraubgewinde	Thread of retaining ring	M 39 x 0,75
Betriebsspannung	Operating voltage	4,2 V
Kürzeste mögliche Belichtungszeit	Shortest possible exposure time	1/500 s
Zusatzgeräte:	Accessory instruments:	
Batteriebehälter	Battery housing	Im Lieferumfang enthalten, Nachbestellungen unter Bestell - Nr. 1 136 009 Supplied with the shutter, reorder under No. 1 136 009
Netzgerät	Transformer and rectifier	Bestell-Nr. Order-No. 1 136 012
Blendeneinstellgerät	Diaphragm setting unit	siehe separate information see separate information

Elektronisch gesteuerte Verschußzeiten, T-Einstellung, Sektorenöffnungseinrichtung, acht Blendenwerte in 1/3 Stufen rastbar, Spannhebel (mechanischer Verschußantrieb, Spannverschuß) Auslösehebel, Nippel für Drahtauslöser, Stecker für Batteriebehälter, Stecker für Blitzlichtanschluß (x-synchronisiert)

Electronically controlled shutter speeds (click stops), "T" setting, blade opening device, 8 f/values (click stops at 1/3 intervals), tensioning lever (mechanical shutter drive, single action shutter), release lever, cable release nipple, socket for battery housing, flash terminal ("X" synchronisation)

Für Maße und Daten sind nur Angaben der Originalzeichnung 1 131 008 verbindlich
For dimensions and other data original factory drawing 1 131 008 is available

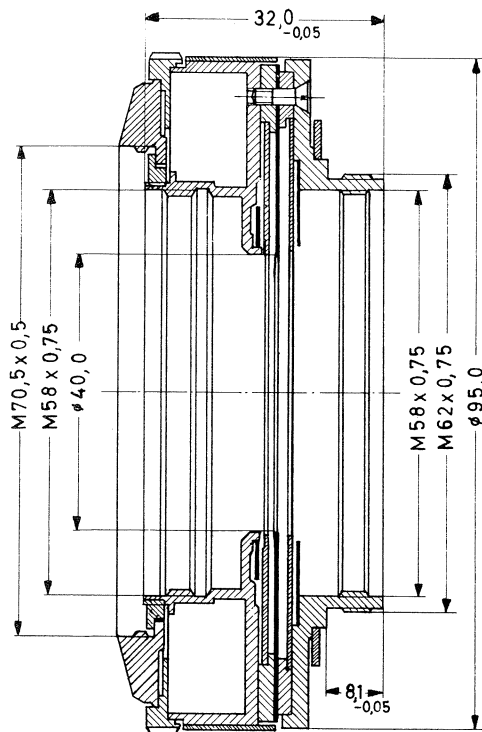
COMPUR electronic Verschlußgröße 3

COMPUR electronic Shutter size 3

134

Order No. 1 134 005
(CN-1531-000a)

Bestell-Nr. 1 134 005
(CN-1531-000a)



Belichtungszeiten

Exposure times

32 16 8 4 2 1 1/2 1/4 1/8 1/15 1/30
1/60 1/125 1/200 und T and T

Blende

Diaphragm

Größte Öffnung Maximum aperture ø 40
Kleinste Öffnung Minimum aperture ø 2,5

Gesamthöhe

Total height

32,0_{-0,05} mm

Abstand der Objektivrohr - Stirnflächen

Distance between the front and the rear faces of the nozzle

Gehäusedurchmesser

Housing diameter

95 mm

Fassungsgewinde vorn

Front lens mounting thread

M 58x0,75

Fassungsgewinde hinten

Rear lens mounting thread

M 58 x 0,75

Anschraubgewinde

Thread of retaining ring

M 62 x 0,75

Betriebsspannung

Operating voltage

4,2 V

Kürzeste mögliche Belichtungszeit

Shortest possible exposure time

1/200 s

Zusatzgeräte:

Accessory instruments:

Batteriebehälter

Battery housing

Im Lieferumfang enthalten, Nachbestellung
unter Bestell-Nr. 1 136 009

Supplied with the shutter, reorder
under No. 1 136 009

Netzgerät

Transformer and rectifier

Bestell-Nr. Order-No. 1 136 012
siehe separate Information

Blendeneinstellgerät

Diaphragm setting unit

see separate information

Elektronisch gesteuerte Verschußzeiten (gerastet), T-Einstellung, Sektorenöffnungseinrichtung, acht Blendenwerte in 1/3 Stufen rastbar, Spannhebel, (mechanischer Verschußantrieb, Spannverschuß), Auslösehebel, Nippel für Drahtauslöser, Stecker für Batteriebehälter, Stecker für Blitzlichtanschluß (x-synchronisiert)

Electronically controlled shutter speeds (click stops), "T" setting, blade opening device, 8 f/values (click stops at 1/3 intervals), tensioning lever (mechanical shutter drive, single action shutter), release lever, cable release nipple, socket for battery housing, flash terminal ("X" synchronisation)

Für Maße und Daten sind nur Angaben der Originalzeichnung 1 134 005 verbindlich
For dimensions and other data original factory drawing 1 134 005 is available

PRONTOR-WERK ALFRED GAUTHIER GMBH CALMBACH/SCHWARZW.

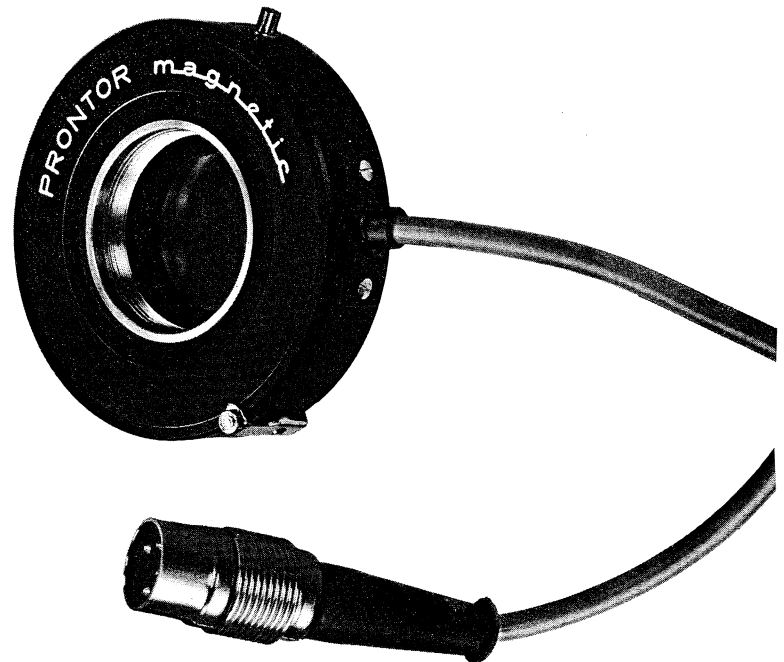
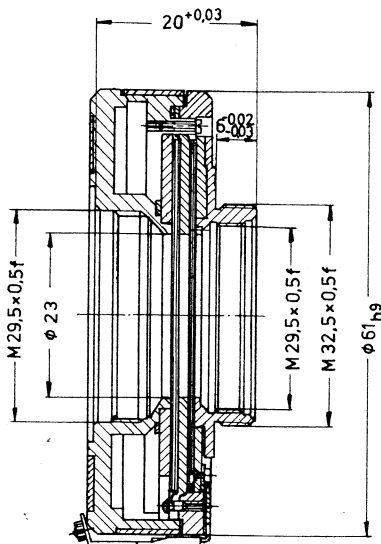
PRONTOR magnetic Verschußgröße 0

PRONTOR magnetic Shutter size 0

016

Order No. 1 016 005

Bestell-Nr. 1 016 005



Belichtungszeiten	Exposure times	32 16 8 4 2 1 1/2 1/4 1/8 1/15 1/30 1/60
Blende	Diaphragm	Größe Öffnung Maximum aperture Ø 23 Kleinste Öffnung Minimum aperture Ø 1,5
Gesamthöhe (Abstand der Objektivrohr - Stirnflächen)	Total height (Distance between the front and the rear faces of the nozzle)	20,0+0,03 mm
Gehäusedurchmesser	Housing diameter	Ø 61 h9
Fassungsgewinde vorn	Front lens mounting thread	M 29,5 x 0,5 f
Fassungsgewinde hinten	Rear lens mounting thread	M 29,5 x 0,5 f
Anschraubgewinde	Thread of retaining ring	M 32,5 x 0,5 f
Kürzeste mögliche Belichtungszeit	Shortest possible exposure time	bei 23 mm Öffnungsdurchmesser 1/60 s opening diameter being 23 mm = 1/60 sec. bei 18 mm Öffnungsdurchmesser ist 1/125 s durch Sondermaßnahmen möglich Special provisions allow 1/125 sec with an opening diameter of 18 mm
Zusatzgerät	Accessory instrument	
Steuergerät	Control device	Bestell-Nr. Order No. 1 017 007

Magnetischer Antrieb (hohe Lebensdauer), Fernbedienung mittels Steuergerät mit Netzanschluß, elektronisch gesteuerte Belichtungszeiten, manuell einstellbare stufenlose Blende.

Magnetic drive (long life), remote speed control with power pack, electronically controlled shutter speeds, manually controlled aperture continuously adjustable.

Für Maße und Daten sind nur Angaben der Originalzeichnung 1 016 005 verbindlich
For dimensions and other data original factory drawing 1 016 005 is available

PRONTOR-WERK ALFRED GAUTHIER GMBH 7547 WILDBAD-5/SCHW.

Contents index for Compur electronic folder

Summary of models

Compur electronic 3	CN 1531-000	Page 1/V	July 1966
Diaphragm setting unit	CN 1531-801.804	Page 1/R	
Compur electronic 5	CN 1732-000	Page 2/V	April 1967
Remove control unit	CN 1032-801	Page 2/R	
Connecting cable	CN 1032-810.812	Page 2/R	
Remove release cable	CN 1032-820.821	Page 2/R	
Compur electronic 1	CN 1331-000	Page 3	July 1968
Compur electronic 1	CN 1331-061	Page 3	July 1968
Diaphragm setting unit	CN 1331-801.804	Page 3/R	
Compur electronic 00-X wide reflection (special shutter for Kodak Stgt.)	CN 1131-055	Page 4	July 1968
Compur electronic m-0	CN 1233-000	Page 5	August 1968
Compur electronic m-1	CN 1333-000	Page 5	
Compur electronic m-3	CN 1533-000	Page 5/R	
Compur electronic m-5	CN 1733-000	Page 6	July 1968

Spare parts list for standard shutters and accessories

Compur electronic 3	CN 1531-000	July 1966
Diaphragm setting unit	CN 1531-801.804	July 1966
Compur electronic 5 FS	CN 1732-000	October 1967
Remove control unit	CN 1032-801	January 1968

Illustration table for the spare parts list

Compur electronic 1	CN 1331-000	chart 1 .. 10	April 1970
Compur electronic 3	CN 1531-801.804	chart 1 .. 11	July 1966
Diaphragm setting unit	CN 1531-000	chart 1/2	July 1966
Compur electronic 5 FS	CN 1732-000	chart 1 .. 8	October 1967
Remove control unit for Compur electronic 5 FS	CN 1032-801	chart 1 .. 3	January 1968

Comments to the spare parts lists

electronic		Page 1	January 1968
electronic		Page 2	October 1969
Repair instructions		Page 1..5	July 1966
Compur electronic 3			
Diaphragm setting unit for			
Compur electronic 3		Page 6	
Compur electronic 5 FS		Pages 7..10	November 1967
Remote control unit for			
Compur electronic 5 FS	CN 1032-801	Pages 11 + 12	November 1967
Compur electronic 1		Pages 13..17	June 1970

Lubrication schedule for shutters

Compur electronic 1	CN 1331-000	April 1970
Compur electronic 3	CN 1531-000	July 1970
Compur electronic 5 FS	CN 1732-000	October 1967
Compur electronic 00-X wide reflection (Special shutter for Kodak Stgt.)	CS 1131-362	December 1968

Spare parts lists for special shutters

Kodak AG, Stuttgart		October 1969
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Illustration table — special shutters

Kodak AG, Stuttgart	CS 1131-362	chart 1	December 1969
	CS 1131-362	chart 2 + 3	December 1968
	CS 1131-362	chart 4	December 1969

Repair instructions for special shutters

Kodak AG, Stuttgart	CS 1131-362	Pages 1 + 2	August 1968
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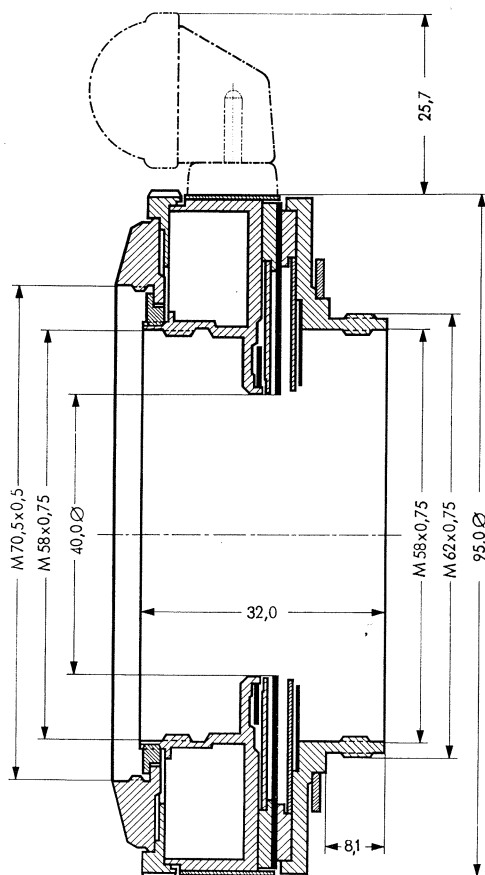
SPECIFICATION OF COMPUR electronic SHUTTERS

Size 3

-electronic-

Page 1

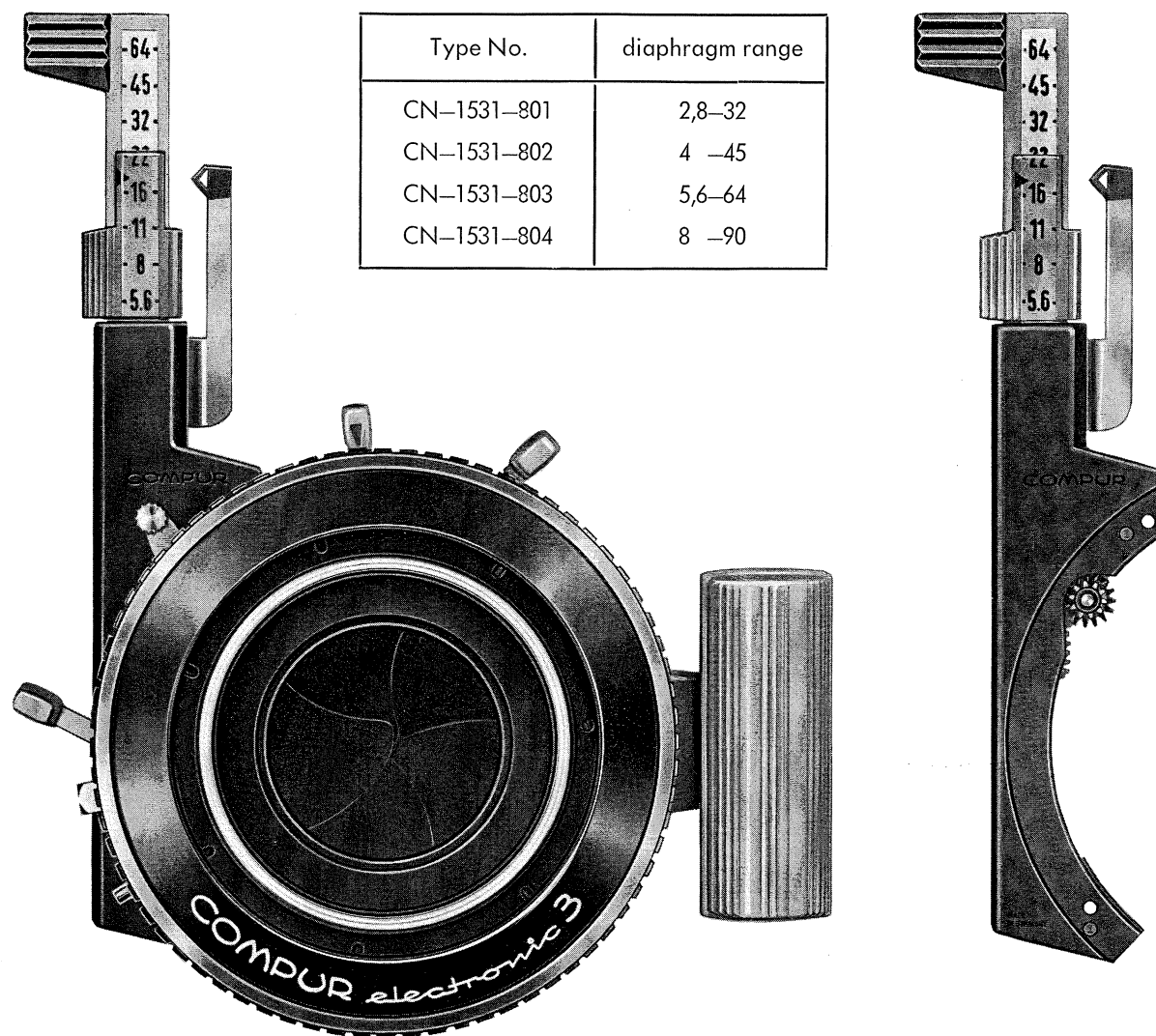
Designation	Type No.
COMPUR electronic 3	CN-1531-000



Electronically controlled shutter speed (click stops):
 32, 16, 8, 4, 2, 1 s, 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/125,
 1/200 s ● T-setting ● blade opening device ● eight
 diaphragm values, click stops provided at 1/3 inter-
 vals ● cocking lever, release lever ● cable release
 socket plug for battery housing ● battery housing.

COMPUR-WERK MÜNCHEN

Diaphragm setting unit for shutter Compur electronic 3



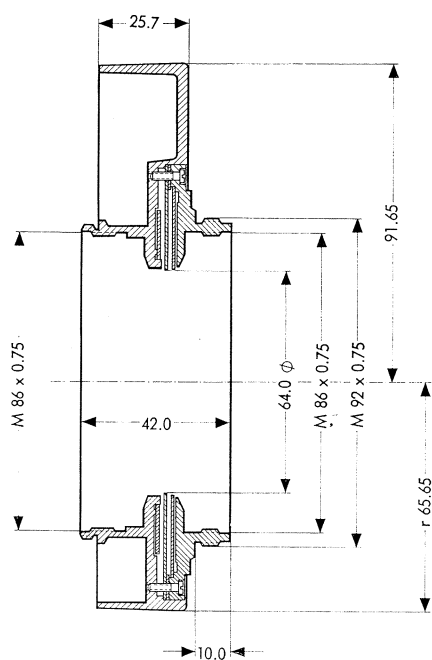
For the selection should be considered: smallest lens opening e. g. CN-1531-801 for "32"

SPECIFICATION OF COMPUR electronic SHUTTERS

Size 5

electronic
Page 2

Designation	Type
COMPUR electronic 5 FS	CN-1732-000



Functions controlled by remote control unit:
Tensioning, speed and f-stop setting, shutter
release, T-function; ● Diaphragm and shutter-
blade opening mechanism; ● Electronically con-
trolled shutter speeds 32, 16, 8, 4, 2, 1, 1/2, 1/4,
1/8, 1/15, 1/30, 1/60 sec; ● Nine f-stop values;
● Socket for connecting cable; Flash terminal
for X-contact.

COMPUR-WERK MÜNCHEN

Accessories to COMPUR electronic 5 FS

Designation	Type
remote control unit	CN-1032-801

Click-stop speed selector 1/60 sec to 32 sec ●
Aperture selector for 10 f-stop values with click stops at 1/3 intervals of which a maximum of 9 (depending on lens type) can be used in conjunction with the shutter ● Selector switch for:

* = normal position

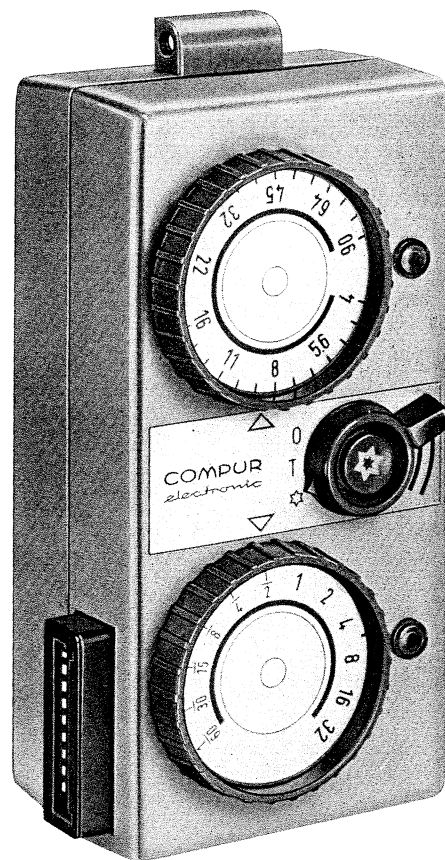
T = time exposure (T)

O = blade-opening mechanism for ground-glass viewing

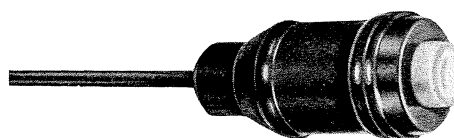
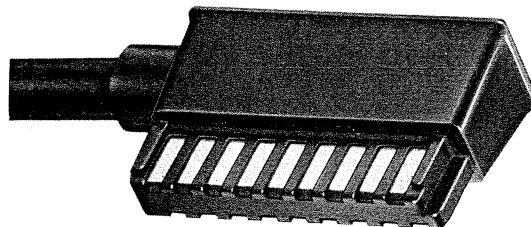
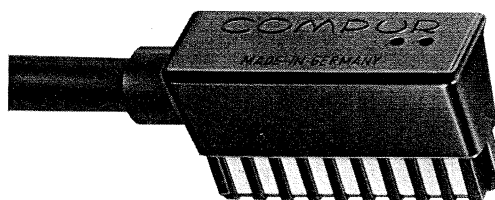
Release key ● Socket for connecting cable ●

Signal lamps for tensioning and f-stop setting ●

● Back: battery tester.



Designation	Type
Connecting cable	
1.5 m long	CN-1032-810
4.0 m long	CN-1032-811
10.0 m long	CN-1032-812
Remote release cable	
4.0 m long	CN-1032-820
10.0 m long	CN-1032-821

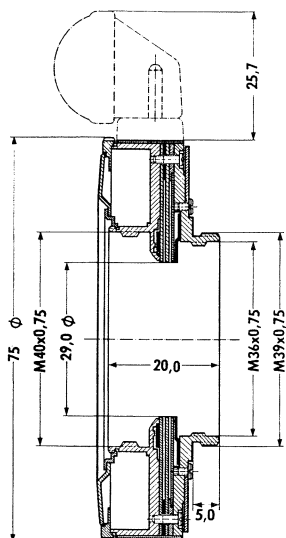


COMPUR-WERK MÜNCHEN

TYPENÜBERSICHT COMPUR electronic Verschlußgröße 1
SPECIFICATION OF COMPUR electronic SHUTTERS Size 1

- electronic -
 Blatt 3
 Sheet 3

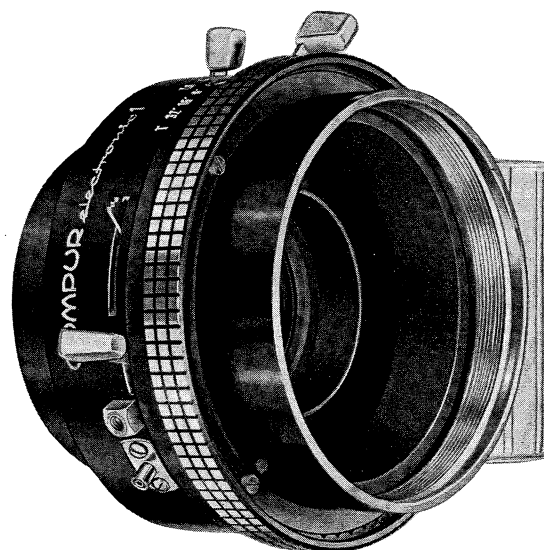
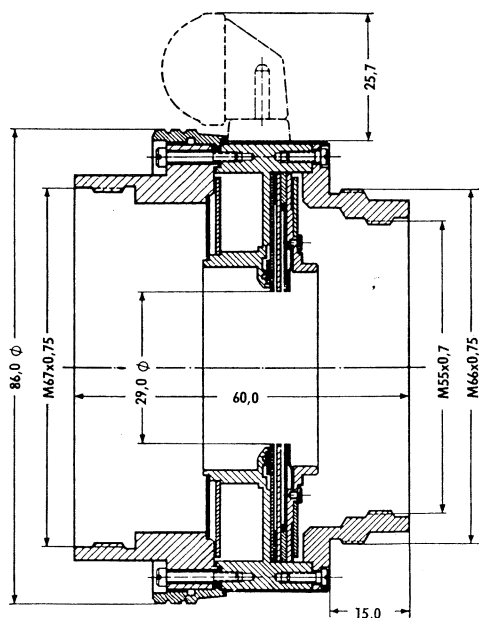
Benennung Designation	Typen-Nr.
COMPUR electronic 1	CN-1331-000



Elektronisch gesteuerte Verschußzeit (gerastet): 32, 16, 8, 4, 2, 1 s, 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/125, 1/250, 1/500s • T-Einstellung • Sektorenöffnungseinrichtung • acht Blendenwerte in 1/3 Stufen rastbar • Spannhel • Auslösehebel • Nippel für Drahtauslöser • Stecker für Batteriebehälter • Batteriebehälter.

Electronically controlled shutter speed (click stops): 32, 16, 8, 4, 2, 1 s, 1/2, 1/4, 1/8, 1/15, 1/30, 1/60, 1/125, 1/250, 1/500 s • T-setting • blade opening device • eight diaphragm values, click stops provided at 1/3 intervals • tensioning lever • release lever • cable release socket plug for battery housing • battery housing.

Benennung Designation	Typen-Nr.
COMPUR electronic 1	CN-1331-061



Verstärkte Ausführung
 für schwere Objektive.

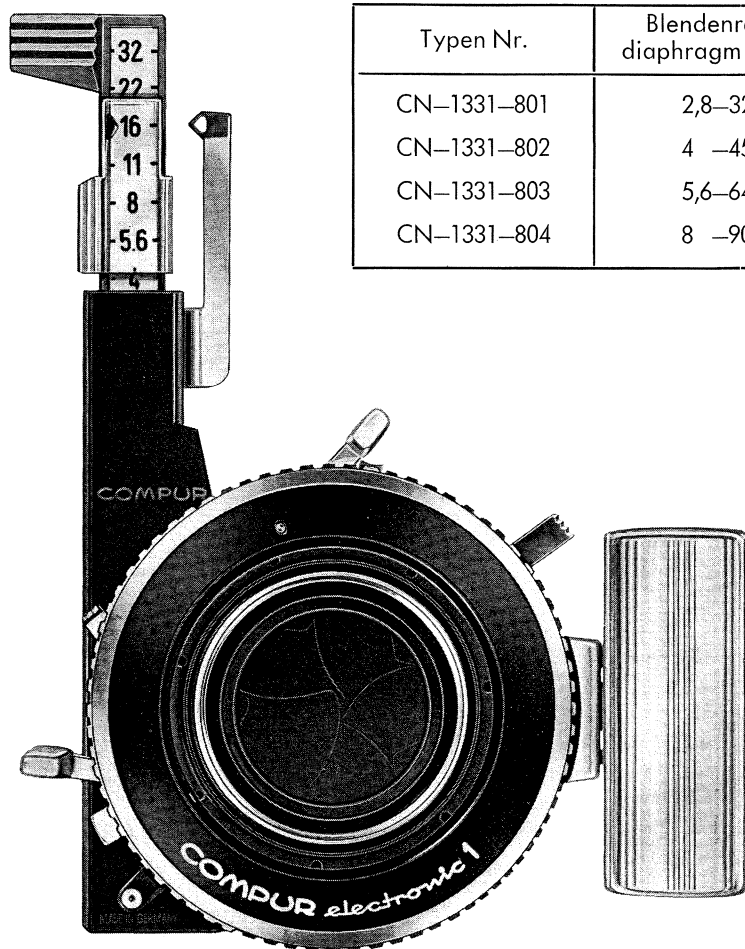
Reinforced version
 for heavy lenses.

Sonst funktionsgleich
 wie CN-1331-000.

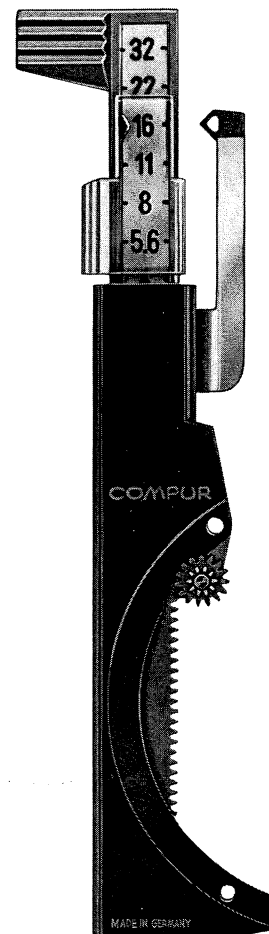
Otherwise same
 as CN-1331-000.

COMPUR-WERK MÜNCHEN

Blendeneinstellgerät zu Compur electronic 1 **Diaphragm setting unit for shutter Compur electronic 1**



Typen Nr.	Blendenreihe diaphragm range
CN-1331-801	2,8-32
CN-1331-802	4 -45
CN-1331-803	5,6-64
CN-1331-804	8 -90



Für die Auswahl maßgebend: Die kleinste Blendenöffnung des Objektivs! Z. B. CN-1331-801 für „32“

For the selection should be considered: smallest lens opening e. g. CN-1331-801 for "32"

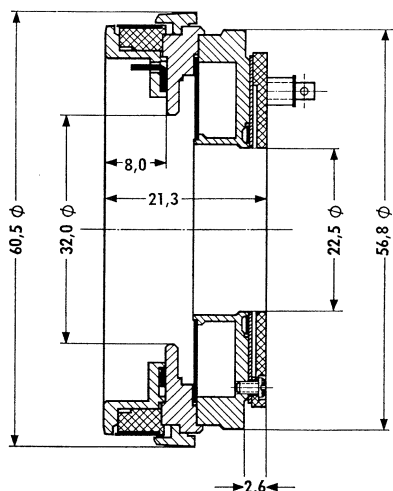
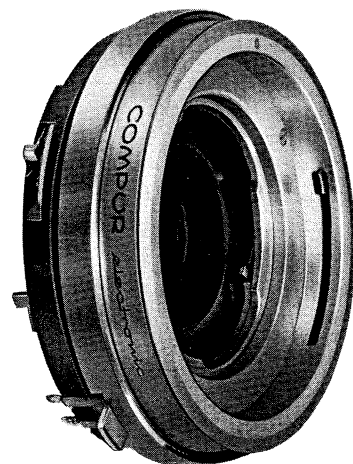
TYPENÜBERSICHT COMPUR electronic Verschlußgröße 00
SPECIFICATION COMPUR electronic Size 00

— electronic —

Blatt 4

Page 4

Benennung Designation	Typen Nr. Type No.	Synchronisation Synchronization
COMPUR-electronic-00-X Weit-Reflex	CN-1131-055	X-Kontakt
COMPUR-electronic-00-X wide-reflex	CN-1131-055	X-contact



Verschluß für elektronische Zeitsteuerung für Reflexkameras mit Belichtungsautomatik und Rückkehrspiegel (zeitbildende Elektronik ist in der Kamera) ● kürzeste Verschußzeit 1/500 sec ● weiter Durchgang ● Spannwellen ● Welle für Sektoren- und Blendenöffnungseinrichtung und Auslösung ● Bajonethalterung mit Riegel für Objektive mit Compur-Wechselfassung ● Einstellring zur Blendenvorwahl (Blende ist in der Wechselfassung).

Shutter for electronic speed control for reflex cameras with automatic exposure control and instant-return mirror (speed-controlling electronic circuitry incorporated in camera) ● Highest shutter speed 1/500 sec ● Wide aperture ● Tensioning shaft ● Shaft for blade and diaphragm opening mechanism and shutter release ● Bayonet mount with lock for lenses in quick-change Compur mount ● Diaphragm preselector ring (diaphragm incorporated in quick-change lens mount).

PARTS LIST
COMPUR electronic 1

CN-1331 - 000

Supple- ment	Stock No.	Description	Qty	Illustration		Type
				Plate	No.	
	1331 30 000 101 81	housing flange	1	CW 1331-000/8	101	
	1303 30 000 102 82	screw-on ring	1	" /1	102	
	1331 10 000 105 80	diaphragm blade	10	" /8	105	
	1331 10 000 106 80	diaphragm cover	1	" /8	106	
	1331 30 000 108 80	diaphragm ring	1	" /8	108	
	1331 30 000 109 80	housing screw	5	" /8	109	
	1331 30 000 110 80	correction slide	1	" /8	110	
	1531 30 000 111 80	correction slide screw	1	" /8	111	
	1331 40 000 114 80	diaphragm retaining spring	1	" /6	114	
	1204 30 000 115 81	locating screw	1		115	
	1331 30 000 116 80	blade cover	1	CW 1331-000/10	116	
	1331 30 000 119 80	shim	1	" /10	119	
	1110 30 000 120 84	screw of diaphragm ring guide	3	" /8	120	
	1331 30 000 122 80	screw of diaphragm ring stop	2	" /8	122	
	1331 30 000 132 80	screw-on ring	1	CW 1531-801/2	132	
	1331 30 000 133 80	spacer ring	1	"	133	
	1331 30 000 142 80	covering disc	1	CW 1331-000/8	142	
	1114 30 151 167 81	ball stop spring	1	" /1	167	
	1110 30 359 175 81	screw for part 142	3	" /8	175	
	1331 30 000 176 80	spacer ring	1	" /10	176	
	1331 10 000 201 83	base plate	1	" /4	201	
	1331 10 000 202 80	blade ring	1	" /10	202	
	1331 10 000 208 80	blade	3	" /10	208	
	1913 30 205 211 80	screw for parts 608 and 366	2	" /6	211	
	1331 40 000 228 80	release axle	1	" /6	223	
	1331 10 000 225 81	blade plate	1	" /10	225	
	1331 40 000 242 80	detent lever	1	" /6	242	
	1331 40 000 244 80	detent lever axle	1	" /6	244	
	1131 30 000 245 80	detent lever spring	1	" /7	245	
	1331 30 000 249 80	blade ring closing spring	1	" /6	249	
	1331 10 000 255 80	disconnecting switch	1	" /6	255	
	1210 30 000 261 83	screw for part 255	1	" /6	261	
	1331 10 000 262 80	opening lever	1	" /4	262	
	1331 30 000 264 80	spring for opening lever	1	" /4	264	
	1331 10 000 267 80	blade lower	1	" /10	267	
	1331 10 000 268 80	blade upper	1	" /10	268	
	1331 40 000 304 80	printed wiring segment screw	1	" /6	304	
	1331 30 000 344 80	escapement slide spring	1	CW 1331-000/2	344	
	1331 30 000 353 80	adjusting plate screw	2	" /2	353	
	1331 10 000 366 80	pre contact	1	" /6	366	
	1331 30 000 369 80	insulating bush	1	" /6	369	
	1331 10 000 370 80	anchor lever	1	" /2	370	
	1331 30 000 375 80	anchor lever spring	1	" /2	375	
	1331 40 000 376 80	spacing collar for printed wiring segment	1	" /6	376	

PRONTOR-WERK ALFRED GAUTHIER GMBH CALMBACH/SCHWARZW.

PARTS LIST
COMPUR electronic 1

CN - 1331 - 000

Supple- ment	Stock-No.	Description	Qty	Jllustration		Type
				Plate	No.	
	1331 30 000 377 80	spacing collar, short	1	CW-1331-000/6	377	
	1331 10 000 378 80	magnet	1	" /2	378	
	1331 20 000 379 80	magnet coil	1	" /2	379	
	1331 10 000 382 80	printed wiring segment for speed control	1	" /6	382	
	1331 10 000 387 80	plug	1	" /6	387	
	1331 30 000 389 80	plug screw	1	" /6	389	
	1331 30 000 389 80	slotted nut for supporting bolt	1	" /6	389	
	1331 30 000 390 80	screw for printed wiring segment	1	" /6	390	
	1331 10 000 391 80	battery container	1	" /1	391	
	1331 10 000 399 81	socket adapter	1	" /1	399	
	1331 20 000 503 80	T-lever	1	" /6	503	
	1331 30 000 505 80	T-lever spring	1	" /4	505	
	1331 10 000 508 80	tripping lever	1	" /4	508	
	1210 10 051 509 82	tensioning ring knob (used f. tensioning lever + tripp lever)	2	" 2+4	509	
	1331 10 000 510 80	locking lever	1	" /4	510	
	1331 30 000 513 80	locking lever spring	1	" /4	513	
	1331 10 000 514 80	drive	1	" /4	514	
	1331 30 000 515 80	drive spring	1	" /2	515	
	1331 10 000 517 80	tensioning pinion	1	" /2	517	
	1331 30 000 527 81	cable release socket	1	" /4	527	
	1331 30 000 533 81	thrust pawl spring	1	" /4	533	
	1331 20 000 536 80	slide spring	1	" /1	536	
	1331 40 000 537 80	slide spring rivet	2	" /1	537	
	1110 30 000 538 82	locking screw	1	" /1	538	
	1331 10 000 539 80	exposure control ring	1	" /1	539	
	1331 30 000 540 80	cover plate	1	" /1	540	
	1331 30 000 541 81	scale band	1	" /2	541	
	1210 30 051 542 80	scale band screw	2	" /2	542	
	1331 30 000 544 80	front ring	1	" /1	544	
	1331 30 000 547 80	threaded ring	1	" /1	547	
	1331 30 000 559 80	release spring	1	" /4	559	
	1331 10 000 584 80	latch	1	" /4	584	
	1331 30 000 586 80	latch spring	1	" /4	586	
	1331 30 000 589 80	thrust lever spring	1	CW-1331-000/4	589	
	1331 10 000 601 80	contact nipple	1	" /6	601	
	1331 30 000 606 80	contact spring	1	" /6	606	
	1331 30 000 608 80	electrical-contact stop	1	" /6	608	
	1331 30 000 612 80	screw for flash nipple	2	" /6	612	
	1331 30 000 615 80	X-contact lever	1	" /6	615	
	1110 30 000 618 80	screw for part 606	1	" /6	618	
	1110 40 030 732 82	rivet for part 114	2	" /6	732	
	1110 30 030 743 81	screw for parts 508 + 830	2	" 2+4	743	
	1331 30 000 526 80	screw for nipple	1	" /4	743	

PRONTOR-WERK ALFRED GAUTHIER GMBH CALMBACH/SCHWARZW.

Supple -
ment

Description

Qty.	Unit	Price	Total
1	100	100	100
2	200	200	200
3	300	300	300
4	400	400	400
5	500	500	500
6	600	600	600
7	700	700	700
8	800	800	800
9	900	900	900
10	1000	1000	1000
11	1100	1100	1100
12	1200	1200	1200
13	1300	1300	1300
14	1400	1400	1400
15	1500	1500	1500
16	1600	1600	1600
17	1700	1700	1700
18	1800	1800	1800
19	1900	1900	1900
20	2000	2000	2000
21	2100	2100	2100
22	2200	2200	2200
23	2300	2300	2300
24	2400	2400	2400
25	2500	2500	2500
26	2600	2600	2600
27	2700	2700	2700
28	2800	2800	2800
29	2900	2900	2900
30	3000	3000	3000
31	3100	3100	3100
32	3200	3200	3200
33	3300	3300	3300
34	3400	3400	3400
35	3500	3500	3500
36	3600	3600	3600
37	3700	3700	3700
38	3800	3800	3800
39	3900	3900	3900
40	4000	4000	4000
41	4100	4100	4100
42	4200	4200	4200
43	4300	4300	4300
44	4400	4400	4400
45	4500	4500	4500
46	4600	4600	4600
47	4700	4700	4700
48	4800	4800	4800
49	4900	4900	4900
50	5000	5000	5000
51	5100	5100	5100
52	5200	5200	5200
53	5300	5300	5300
54	5400	5400	5400
55	5500	5500	5500
56	5600	5600	5600
57	5700	5700	5700
58	5800	5800	5800
59	5900	5900	5900
60	6000	6000	6000
61	6100	6100	6100
62	6200	6200	6200
63	6300	6300	6300
64	6400	6400	6400
65	6500	6500	6500
66	6600	6600	6600
67	6700	6700	6700
68	6800	6800	6800
69	6900	6900	6900
70	7000	7000	7000
71	7100	7100	7100
72	7200	7200	7200
73	7300	7300	7300
74	7400	7400	7400
75	7500	7500	7500
76	7600	7600	7600
77	7700	7700	7700
78	7800	7800	7800
79	7900	7900	7900
80	8000	8000	8000
81	8100	8100	8100
82	8200	8200	8200
83	8300	8300	8300
84	8400	8400	8400
85	8500	8500	8500
86	8600	8600	8600
87	8700	8700	8700
88	8800	8800	8800
89	8900	8900	8900
90	9000	9000	9000
91	9100	9100	

Plate

No.

Type

1331 30 000 829 80

tensioning lever spring

1

CW 1331-000/2

829

1331 10 000 830 80

tensioning lever

1

11 / 2

830

1331 10 000 886 80

printed wiring segment for X-contact
and disconnecting switch

1

" 16

886

1,2 Ø DIN 6799

locking washers

5

1,0 Ø DIN 6799

locking washers

3

M 2,0 DIN 562

square nut

1

CW-1331-000/6

2 Ø mm III DIN 540

sphere

1

" /1

PARTS LIST
COMPUR electronic 3
CN-1531-000

	Stock No.	Description	Qty.	Illustration		Type
				Plate	No.	
	1531 30 000 101 81	Housing flange	1	CN-1531-000/8	101	
	1531 30 000 102 81	Screw-on ring	1	" /1	102	
	1531 10 000 105 80	Diaphragm blade	10	" /8	105	
	1531 10 000 106 80	Diaphragm cover	1	" /8	106	
	1531 30 000 108 81	Diaphragm ring	1	" /8	108	
	1531 30 000 109 80	Housing screw	4	" /8	109	
	1531 30 000 110 80	Correction slide	1	" /8	110	
	1531 30 000 111 80	Correction slide screw	1	" /8	111	
	1531 40 000 114 80	Diaphragm retaining spring	1	" /8	114	
	1531 30 000 116 80	Blade cover	1	" /10	116	
	1110 30 005 117 61	Blade cover screw (used for Cover ring 142)	3	" /8	117	
	1210 10 051 118 80	Diaphragm ring knob	1	" /8	118	
	1531 30 000 119 80	Shim	1	" /8	119	
	1531 30 000 120 81	Screw of diaphragm ring guide	3	" /8	120	
	1531 30 000 122 80	Screw of diaphragm ring stop	2	" /8	122	
	1531 30 000 135 80	Spacer ring	1	CN-1531-801/2	135	
	1531 30 000 142 81	Cover ring	1	CN-1531-000/8	142	
	1114 30 151 167 81	Ball stop spring	1	" /1	167	
	1531 30 000 176 80	Spacer ring	1	" /10	176	
	1531 10 000 201 82	Base plate	1	" /6	201	
	1531 10 000 202 80	Blade ring	1	" /10	202	
	1531 10 000 208 80	Blade	3	" /10	208	
	1531 40 000 242 80	Detent lever	1	" /4	242	
	1531 30 000 245 80	Cam check lever spring	1	" /4	245	
	1531 30 000 249 80	Blade ring closing spring	1	" /6	249	
	1531 10 000 252 80	Blade opening ring	1	" /10	252	
	1531 10 000 262 80	Blade opening lever	1	" /4	262	
	1531 40 000 263 80	Shaft of blade opening lever	1	" /4	263	
	1531 30 000 264 80	Blade opening lever spring	1	" /4	264	
	1531 10 000 267 80	Blade, lower	1	" /10	267	
	1531 10 000 268 80	Blade, upper	1	" /10	268	
	1210 30 051 269 80	Blade opening lever button	1	" /4	269	
	1531 40 000 277 80	Latch shaft	1	" /4	277	
	1531 30 000 304 80	Printed wiring segment screw	1	" /6	304	
	1531 40 000 366 80	Pre-contact spring	1	" /6	366	
	1531 40 000 367 80	Pre-contact stop	1	" /6	367	
	1531 40 000 368 80	Insulating bush for pre-contact	1	" /6	368	
	1531 10 000 341 82	Escapement lever	1	" /2	341	
	1531 30 000 344 81	Escapement lever spring	1	" /2	344	
	1531 10 000 370 81	Anchor lever	1	" /2	370	
	1531 20 000 372 81	Anchor plate	1	" /2	372	
	1531 30 000 375 80	Anchor lever spring	1	" /2	375	
	1531 30 000 376 80	Spacing collar long	1	" /6	376	
	1531 30 000 377 80	Spacing collar short	1	" /6	377	

COMPUR-WERK MÜNCHEN

	Stock No.	Description	Qty.	Illustration	
				Plate	No.
	1531 10 000 378 81	Magnet	1	CN-1531-000/4	378
	1531 30 000 380 80	Magnet screw	1	" /4	380
	1531 30 000 381 80	Spacing collar for magnet	2	" /4	381
	1531 10 000 382 80	Printed wiring segment for speed control	1	" /6	382
	1531 10 000 387 80	Plug	1	" /6	387
	1531 30 000 389 80	Slotted nut for supporting bolt	1	" /6	389
	1531 30 000 390 80	Screw for printed wiring segment, with flange	1	" /6	390
	1531 10 000 391 80	Battery Container	1	" /1	391
	1531 20 000 503 81	T-lever	1	" /4	503
	1531 10 000 508 80	Tripping lever	1	" /4	508
	1210 10 051 509 82	Tensioning ring knob (used for Tensioning lever and Tripping lever)	2	" /2 u. 4	509
	1531 10 000 510 80	Locking lever	1	" /2	510
	1531 30 000 513 80	Locking lever spring	1	" /2	513
	1531 10 000 514 81	Drive	1	" /2	514
	1531 30 000 515 81	Drive spring	1	" /2	515
	1531 10 000 517 80	Tensioning pinion	1	" /2	517
	1531 30 000 527 80	Cable release socket	1	" /6	527
	1531 30 000 533 80	Thrust pawl spring	1	" /4	533
	1531 20 000 535 81	Wiper	1	" /1	535
	1110 30 000 538 82	Locking screw	1	" /1	538
	1531 10 000 539 80	Exposure control ring	1	" /1	539
	1531 30 000 540 80	Cover plate	1	" /1	540
	1531 30 000 541 80	Engraved scale	1	" /2	541
	1210 30 051 542 80	Screw for engraved scale	2	" /2	542
	1531 30 000 547 80	Threaded ring	1	" /1	547
	1531 30 000 559 80	Release spring	1	" /4	559
	1531 10 000 584 80	Latch	1	" /4	584
	1531 30 000 589 80	Thrust lever spring	1	" /4	589
	1531 20 000 600 80	Flash terminal	1	" /6	600
	1531 30 000 605 81	Flash terminal spring	1	" /6	605
	1531 30 000 612 80	Flash terminal screw (including 1 screw for Flash terminal spring)	3	" /6	612
	1531 30 000 615 81	X-contact lever	1	" /6	615
	1110 40 030 732 82	Rivet for spring lug (for diaphragm retaining spring and wiper)	4	" /1 u. 8	732
	1110 40 030 733 80	Locking arm washer (used for wiper)	2	" /1	733
	1110 30 030 743 81	Bqyonet lock screw (used for opening lever knob Tripping lever and Tensioning lever)	3	" /2 u. 4	743
	1210 30 051 821 80	Countersunk screw (for diaphragm ring knob)	1	" /8	821
	1531 30 000 829 80	Tensioning lever spring	1	" /2	829
	1531 10 000 830 80	Tensioning lever	1	" /2	830
	1,2 ϕ DIN 6799	Locking washer	8	" /2 4 u. 6	—
	M 3 x 6 DIN 84	Fillister head screw (for plug)	1	" /6	—
	M 3 DIN 562	Square nut (for plug)	1	" /6	—
	2 mm III DIN 5401	Ball	1	" /1	—

COMPUR-WERK MÜNCHEN

CN-1531-801
up to
CN-1531-804

	Part No.	Description	Qty.	Illustration		Type
				Plate	No.	
	1531 30 801 850 80	Carrier of diaphragm setting unit	1	CN-1531-801/1	850	CN-1531-801 diaphragm range 2.8—32
	1531 10 801 851 80	Carrier plate	1	" /1	851	
	1531 10 801 853 80	Idler	1	" /1	853	
	1531 30 801 855 80	Pointer	1	" /1	855	
	1531 30 801 856 80	Pointer screw	2	" /1	856	
	1531 30 801 857 80	Selector slide	1	" /1	857	
	1531 40 801 858 80	Aperture scale	1	" /1	858	
	1531 30 801 860 80	Pre-selection stop spring	1	" /1	860	
	1531 30 801 861 80	Screw for diaphragm setting unit	2	" /2	861	
	1531 30 801 862 80	Stop screw	1	" /1	862	
	1531 10 801 864 80	Pre-selection stop	1	" /1	864	
	1,5 mm DIN 6799	Locking washer	1	" /1	—	
	1531 40 802 858 80	Aperture scale	1	CN-1531-801/1	858	CN-1531-802 diaphragm range 4—45
all other parts as for CN-1531-801						
	1531 40 803 858 80	Aperture scale	1	CN-1531-801/1	858	CN-1531-803 diaphragm range 5.6—64
all other parts as for CN-1531-801						
	1531 40 804 858 80	Aperture scale	1	CN-1531-801/1	858	CN-1531-804 diaphragm range 8—90
all other parts as for CN-1531-801						
COMPUR-WERK MÜNCHEN						

PARTS LIST
COMPUR electronic 5 FS

CN-1732-000

Supple- ment	Stock No.	Description	Qty.	Illustration		Type
				Plate	No.	
②	1732 30 000 101 85	Housing flange	1	CN-1732-000/7	101	
①	1732 30 000 102 81	Screw-on ring	1	" /1	102	
②	1732 10 000 105 82	Diaphragm blade	10	" /7	105	
	1732 10 000 106 80	Diaphragm cover	1	" /7	106	
②	1732 30 000 116 83	Blade cover	1	" /7	116	
	1732 30 000 119 81	Shim	1	" /7	119	
	1732 10 000 122 81	Diaphragm stop	1	" /6	122	
①	1732 30 000 135 80	Spacer ring	1	" /1	135	
③	1732 30 000 183 80	Housing mounting shim	5	" /7	183	
×	1732 10 000 201 82	Base plate	1	" /8	201	
	1732 10 000 202 80	Blade ring	1	" /8	202	
	1732 10 000 208 80	Blade	5	" /8	208	
	1732 30 000 230 81	Blade ring fixing screw	3	" /8	230	
	1732 30 000 238 80	Blade shim	12	" /8	238	
	1732 30 000 249 81	Blade ring closing spring	1	" /3	249	
	1110 30 000 261 82	Mounting tube screw	3			
		(for printed wiring board, motor side)	2	" /3	261	
		(for printed wiring board, drive side)	1	" /2	261	
	1732 30 000 265 80	Small retaining plate	1	" /5	265	
	1732 10 000 268 80	Cover blade	1	" /8	268	
	1732 30 000 290 80	Fixing screw	1	" /5	290	
	1110 30 000 323 81	Escapement screw	1	" /6	323	
		(for mounting wiper)				
	1732 30 000 341 81	Escapement lever	1	" /2	341	
	1732 30 000 344 80	Escapement lever spring	1	" /2	344	
	1732 30 000 375 80	Anchor spring	1	" /2-3	375	
	1732 10 000 378 80	Escapement magnet	1	" /2	378	
	1732 30 000 380 80	Fillister head screw	2	" /2-3	380	
	1732 30 000 381 80	Spacing collar for magnet	2	" /2-3	381	
	1732 10 000 500 81	Tensioning gear, complete	1	" /4	500	
	1732 10 000 508 80	Shutter release magnet	1	" /3	508	
	1732 10 000 510 80	Locking lever	1	" /3	510	
	1732 30 000 513 80	Locking lever spring	1	" /3	513	
	1732 10 000 514 82	Drive	1	" /2	514	
	1732 30 000 515 81	Drive spring	1	" /2	515	
	1732 10 000 517 80	Tensioning pinion	1	" /2	517	
	1732 30 000 533 80	Thrust pawl spring	1	" /3	533	
	1732 30 000 537 80	Cover sheet	1	" /4	537	
	1732 10 000 540 81	Cover plate	1	" /1	540	
	1732 30 000 547 80	Threaded ring	1	" /1	547	
	1732 10 000 600 80	Flash terminal	1	" /3	600	
	1531 30 000 612 80	Flash terminal screw	6			
		(for flash terminal)	2	" /3	612	
		(for diaphragm stop)	2	" /6	612	

COMPUR-WERK MÜNCHEN

Supple- ment	Stock No.	Description	Qty.	Illustration		Type
				Plate	No.	
		(for cover sheet)	2	CN—1732—000/4	612	
	1000 30 800 708 81	Shim	2	" /6	708	
	1732 10 000 800 81	Diaphragm gear, complete	1	" /5	800	
	1732 10 000 850 80	Motor support	2	" /4-5	850	
	1732 30 000 851 80	Lock ring	2	" /3	851	
	1732 30 000 852 80	Connecting gear	1	" /4-5	852	
	1732 10 000 868 80	Tensioning detent	1	" /2	868	
	1732 40 000 871 80	Tensioning roller	1	" /2	871	
	1732 30 000 874 80	Tensioning detent spring	1	" /2	874	
	1732 10 000 875 80	Aperture control pinion	1	" /5	875	
	1732 30 000 879 80	Tapping screw	2	" /6	879	
	1732 20 000 880 80	Printed wiring segment f. aperture control	1	" /6	880	
④	1732 10 000 881 80	Potentiometer	1	" /6	881	
	1732 10 000 883 80	Wiper (carrier plate)	1	" /6	883	
	1732 30 000 884 80	Shim for printed wiring board	3	" /2-3	884	
	1732 10 000 885 80	Printed wiring board, motor side	1	" /3	885	
	1732 10 000 886 81	Printed wiring board, plug side	1	" /3	886	
	1732 10 000 887 81	Printed wiring board, drive side	1	" /2	887	
	1732 30 000 890 80	Potentiometer fixing screw	2	" /6	890	
	1732 30 000 891 80	Compression spring	2	" /6	891	
	1732 30 000 892 80	Setting pinion	1	" /6	892	
	1732 10 000 893 81	Terminal carrier	1	" /6	893	
	1732 10 000 896 80	18-pole socket	1	" /3	896	
	1732 40 000 899 80	Name plate	1	" /1	899	
	M 1,7 x 3 DIN 84	Fillister head screw	4	" /4-5	See part No.	
	M 2 x 4 DIN 84	Fillister head screw	7	" /2-3-4-5		
	M 2 x 6 DIN 84	Fillister head screw	2	" /1		
	M 2 x 8 DIN 84	Fillister head screw	5	" /7		
	M 3 DIN 546	Slotted nut	1	" /6-7		
	2,2 DIN 125	Shim	2	" /2-3		
	1,2 DIN 6799	Locking washer	1	" /2		
	1,5 DIN 6799	Locking washer	8	" /2-3-4-5		
	599 80 001	Motor with drive pinion	1	" /3		
	599 80 002	Motor with diaphragm pinion	1	" /3		

PARTS LIST
Remote Control Unit for COMPUR electronic 5 FS

CN-1032-801

Supple- ment	Stock No.	Description	Qty.	Illustration	
				Plate	No.
	1204 30 000 304 81	Plate screw (used for contact disk for release)	1	CN-1732-801/3	304
	1032 10 801 801 80	Housing top	1	" /3	801
	1032 40 801 803 80	Name plate	1	" /3	803
	1032 30 801 804 80	Leaf spring	3	" /3	804
	1032 30 801 805 81	Contact spring	1	" /3	805
	1032 10 801 806 80	Aperture selector dial	1	" /3	806
	1032 10 801 808 80	Speed selector dial	1	" /3	808
	1032 30 801 810 80	Supporting disk	2	" /3	810
	1032 30 801 811 80	Sliding contact	2	" /3	811
	1032 30 801 812 80	Button	1	" /3	812
	1032 10 801 813 80	Terminal carrier	1	" /3	813
	1032 30 801 816 80	Lock spring for button	1	" /3	816
	1032 30 801 817 80	Release button	1	" /3	817
	1032 30 801 818 80	Release button spring	1	" /3	818
	1032 10 801 819 80	Contact disk for release	1	" /3	819
⑤	1032 20 801 821 80	Upper printed wiring board	1	" /2	821
	1032 30 801 822 80	Spacer sleeve	2	" /2	822
	1032 30 801 823 80	Contact spring for battery	2	" /2	823
	1032 30 801 824 80	Spacer bushing	2	" /2	824
⑤	1032 20 801 825 80	Lower printed wiring board	1	" /2	825
⑤	1032 10 801 825 80	Electronic unit complete	1	" /2	10 825
	1032 10 801 826 80	Battery bottom	1	" /2	826
	1032 10 801 828 80	Housing bottom	1	" /1	828
	1032 30 801 829 80	Test button	1	" /1	829
	1032 10 801 830 80	Test spring	1	" /1	830
	1032 30 801 831 80	Socket wrench for lamp replacement	1	" /2	831
	1032 30 801 832 80	Spring clip, single, for battery	2	" /1	832
	1032 30 801 833 80	Spring clip, double, for battery	2	" /1	833
	1032 30 801 834 81	Shank threaded screw	2	" /1	834
	1032 40 801 835 80	Sign plate	1	" /1	835
	1732 30 000 879 80	Tapping screw	3	" /1-2	879
⑤	1032 20 801 896 80	18-pole socket	1	" /2	896
	1032 30 801 897 80	Tapping screw	3	" /3	897
	599 90 001	Type L midget lamp	2	" /2	001
	599 90 004	Battery tester	1	" /1	004
	599 90 005	Magnifying lens	2	" /3	005
	M 3 x 8 DIN 921	Oval head screw	2	" /3	See part-no.
	M 4 DIN 934	Hexagon nut	2	" /2	
	4,3 DIN 125	Disk	2	" /2	
	5,3 DIN 125	Disk	2	" /3	
	R 3,9 - 1,8	Cord ring	4	" /1	
	3 Kl. III DIN 5401	Steel ball	5	" /3	

COMPUR-WERK MÜNCHEN

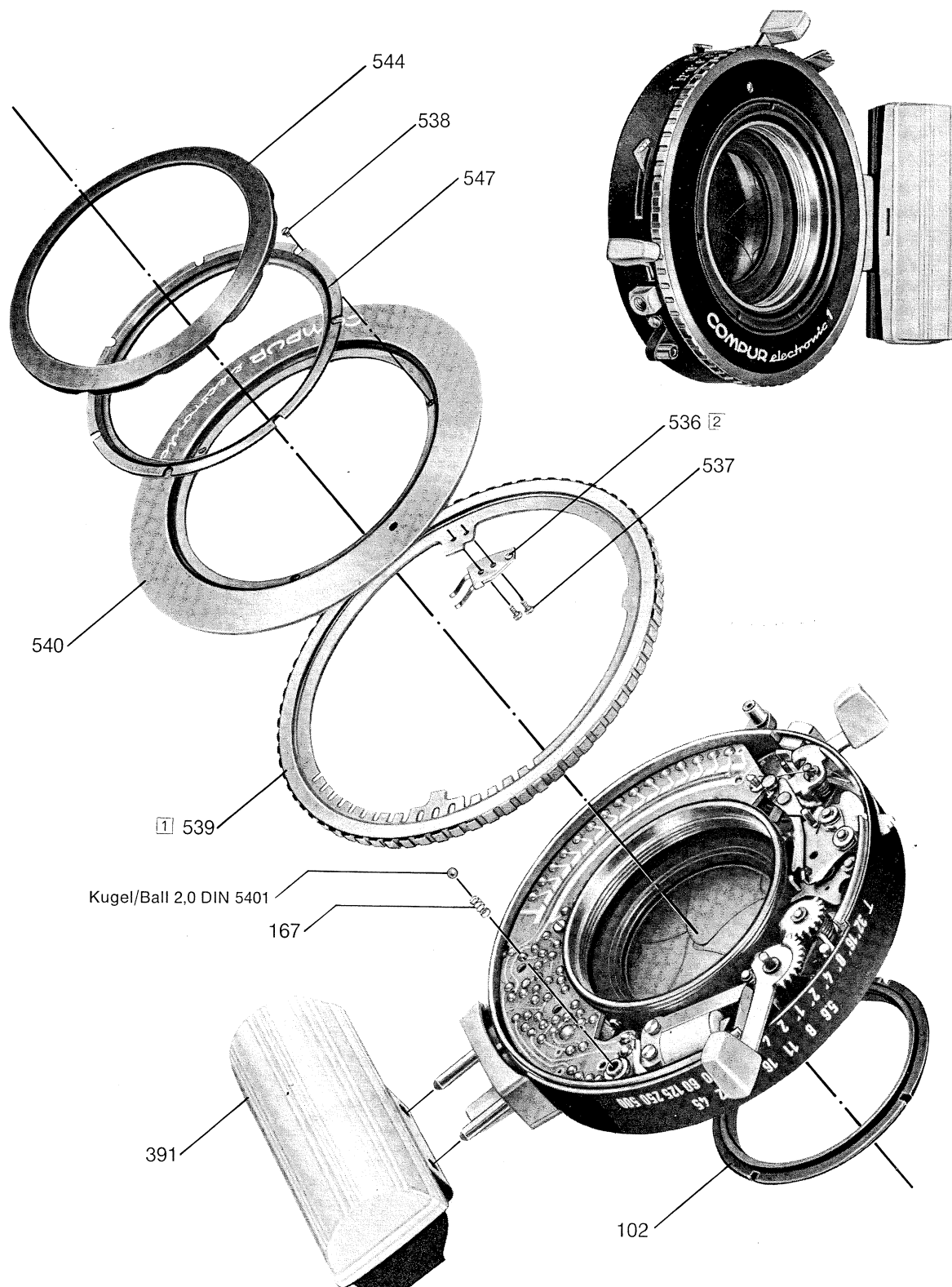
COMPUR

electronic 1

CN-1331-000

Tafel 1
Plate 1

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
 Supplement No. ○ See section □ of instructions for repairs



COMPUR-WERK MÜNCHEN

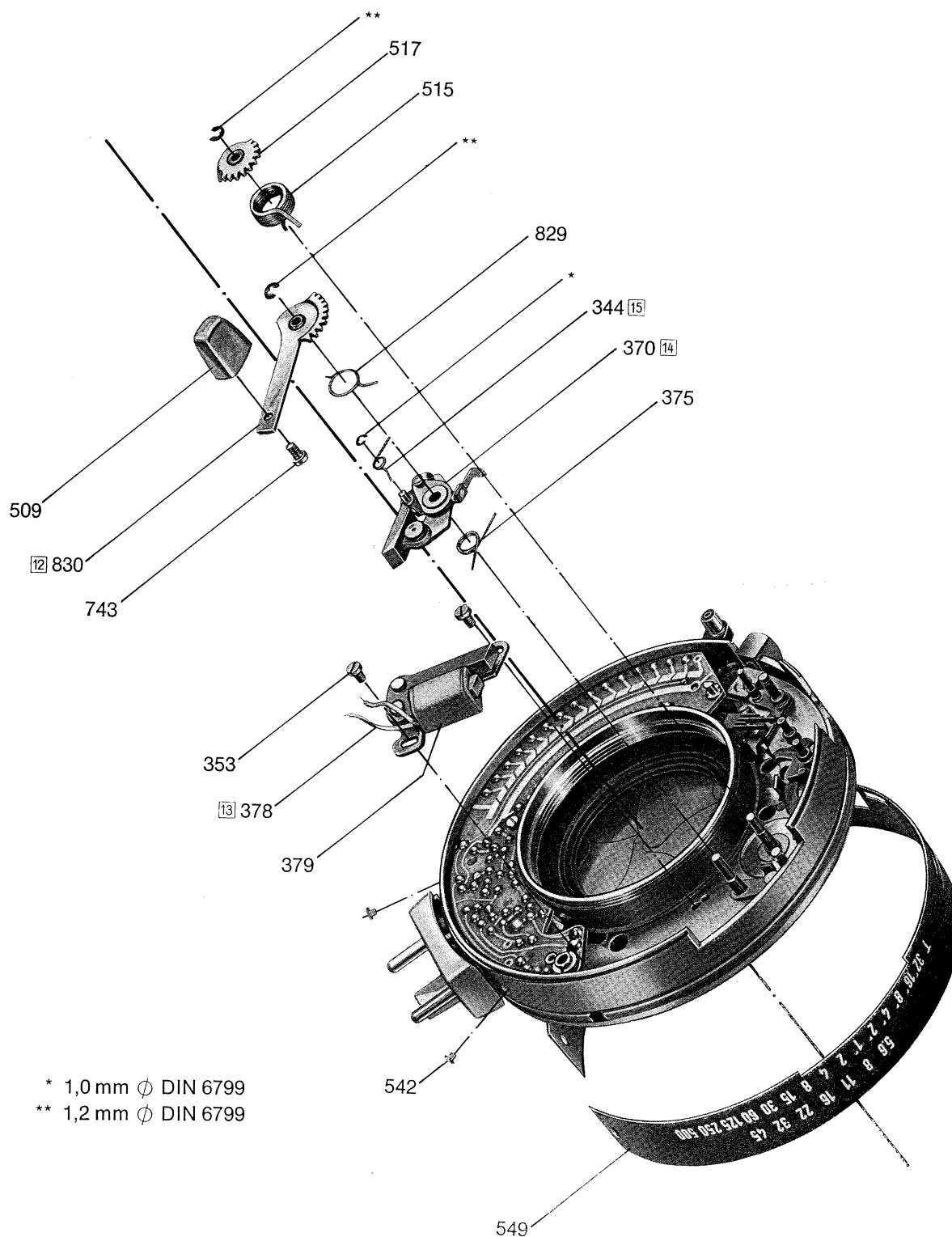
COMPUR

electronic 1

CN-1331-000

Tafel 2
Plate 2

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
 Supplement No. ○ See section □ of instructions for repairs



COMPUR-WERK MÜNCHEN

COMPUR

electronic 1

CN-1331-000

Tafel 3
Plate 3

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
 Supplement No. ○ See section □ of instructions for repairs

Fig. 1

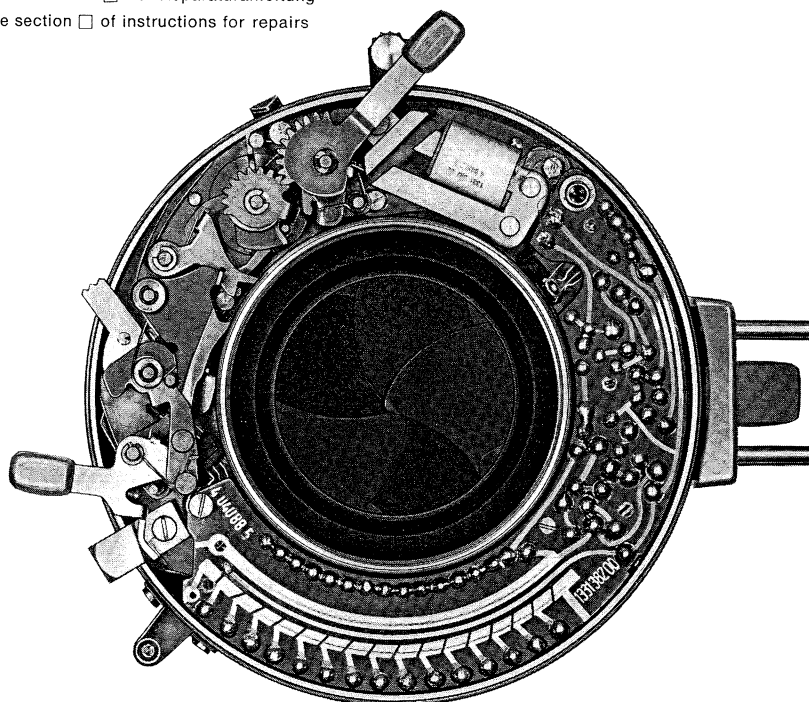


Fig. 2

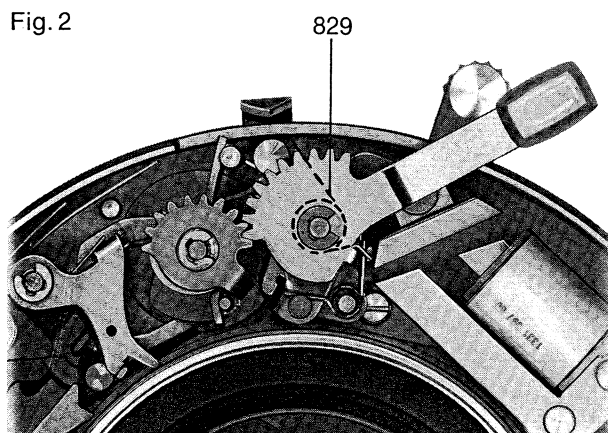


Fig. 3

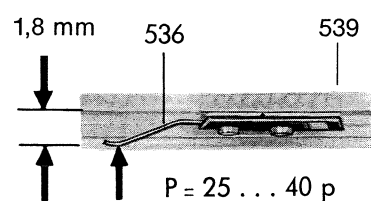
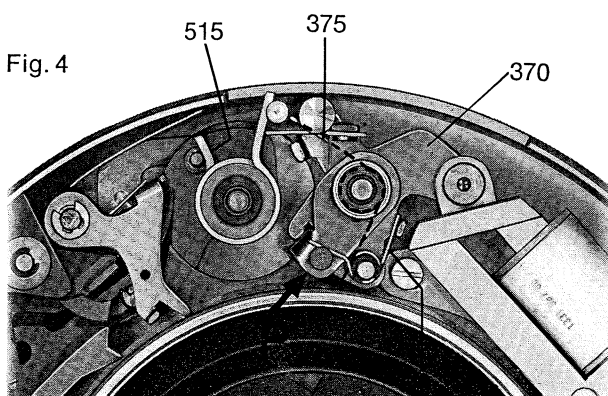


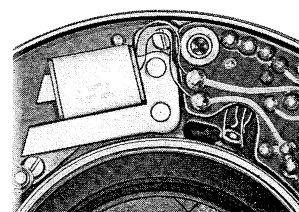
Fig. 4



P = 500 - 700 p

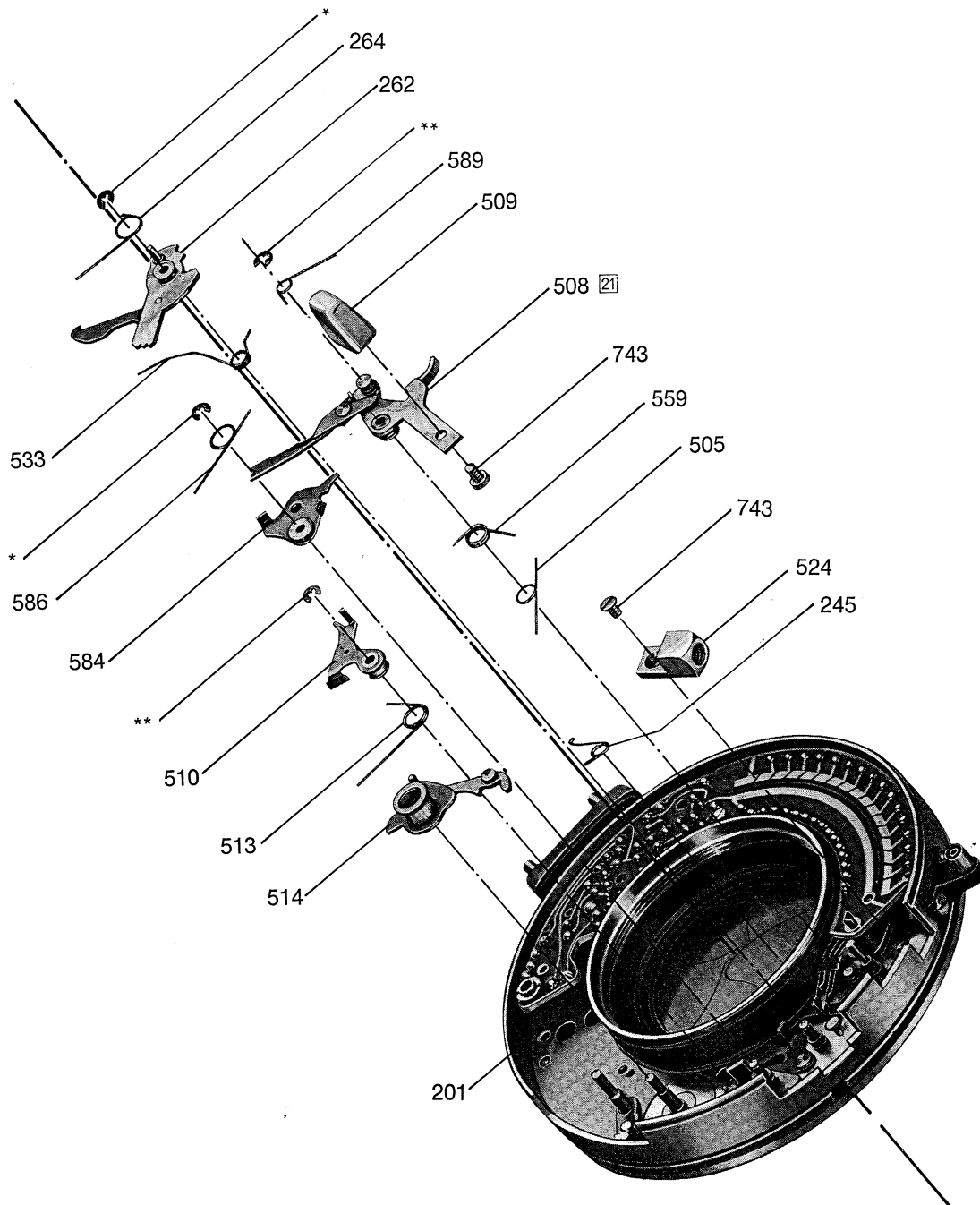
344

Fig. 5



COMPUR-WERK MÜNCHEN

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
Supplement No. ○ See section □ of instructions for repairs



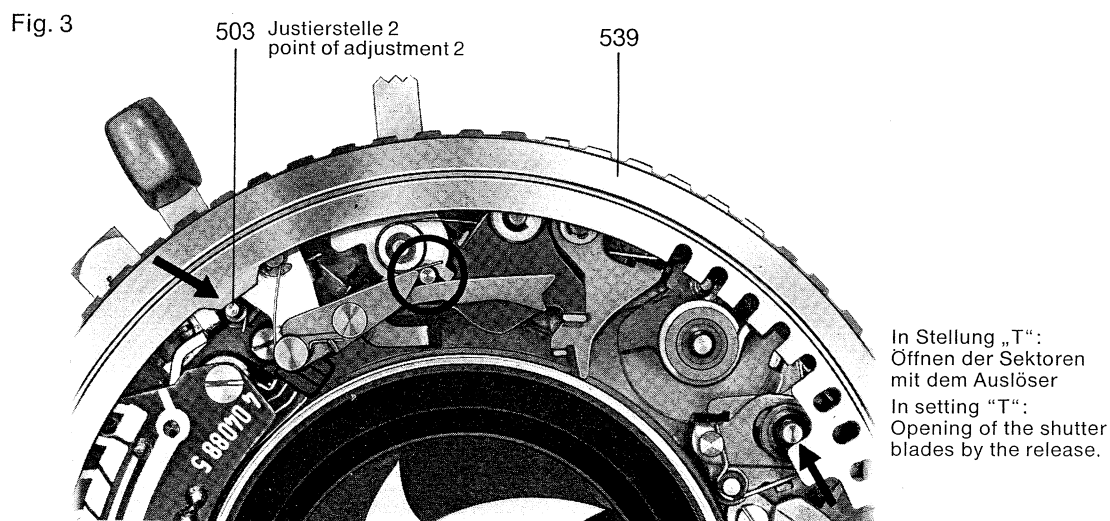
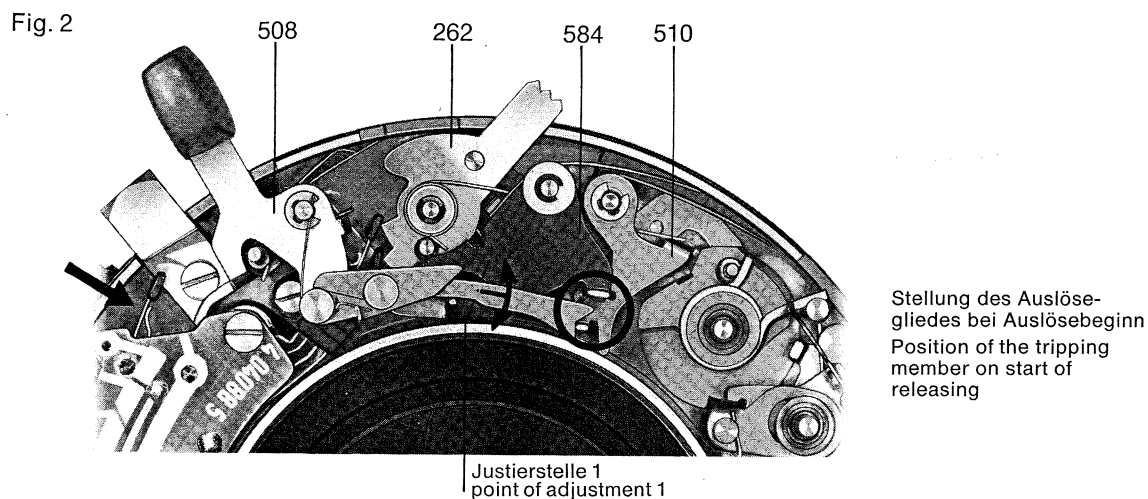
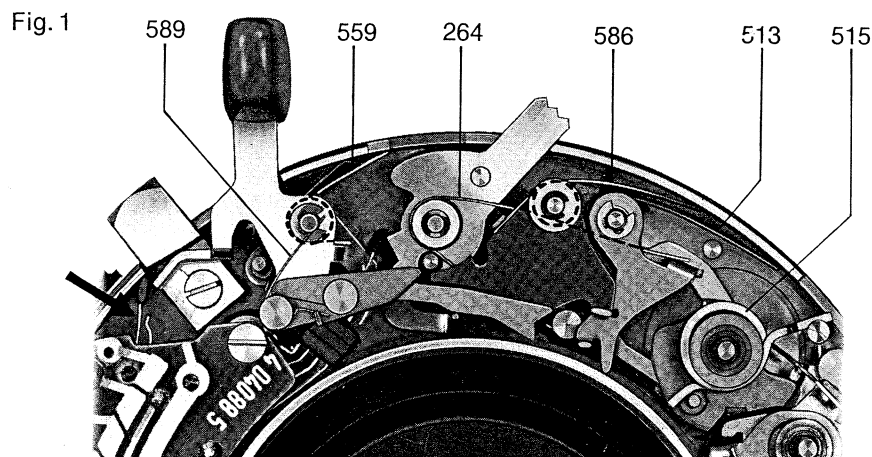
* 1,0 mm ϕ DIN 6799
* * 1,2 mm ϕ DIN 6799

COMPUR electronic 1

CN-1331-000

Tafel 5
Plate 5

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
 Supplement No. ○ See section □ of instructions for repairs



COMPUR-WERK MÜNCHEN

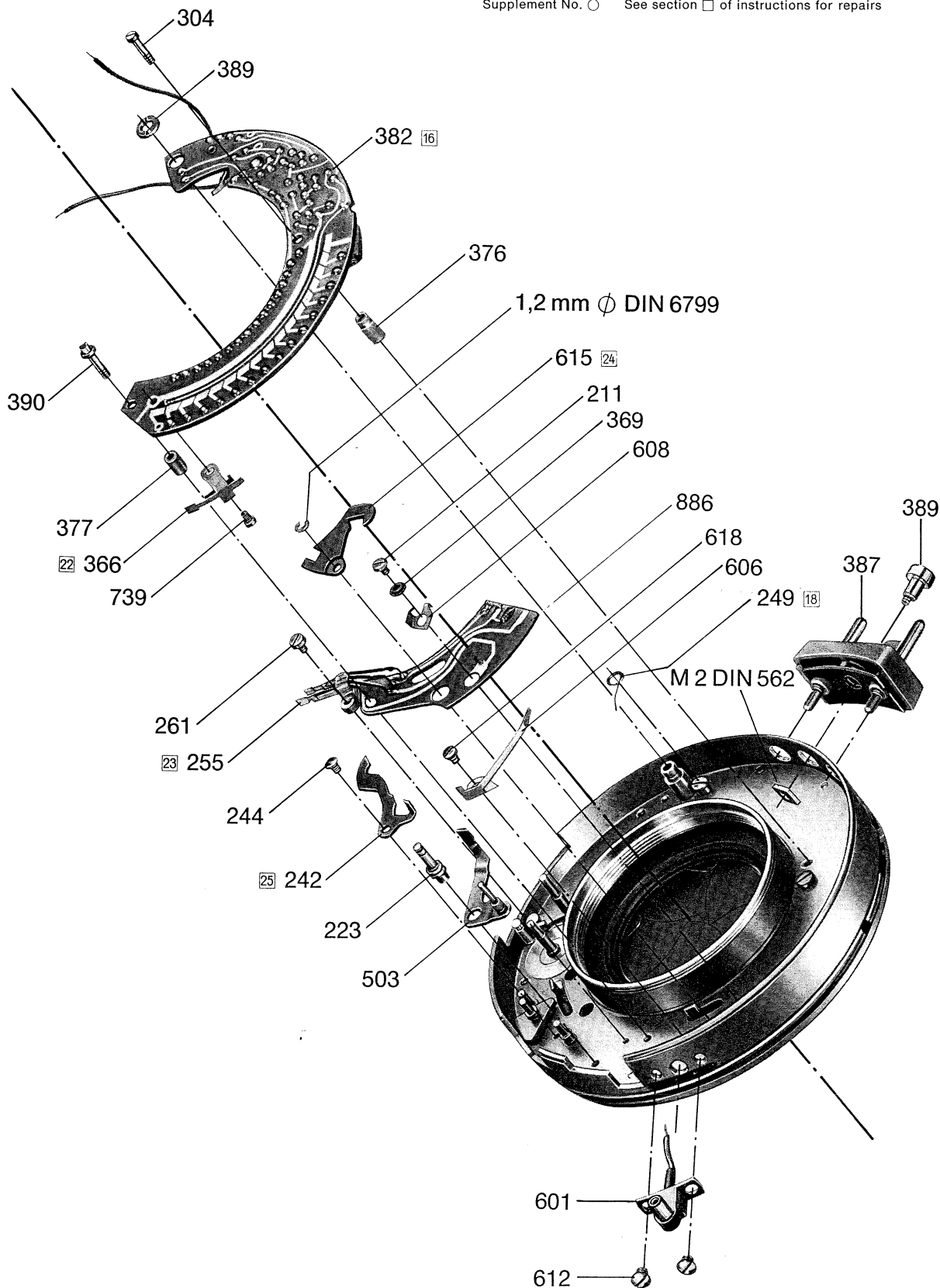
COMPUR

electronic 1

CN-1331-000**Tafel 6****Plate 6**

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung

Supplement No. ○ See section □ of instructions for repairs

**COMPUR-WERK MÜNCHEN**

COMPUR

electronic 1

CN-1331-000

Tafel 7
Plate 7

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
 Supplement No. ○ See section □ of instructions for repairs

Fig. 1

19

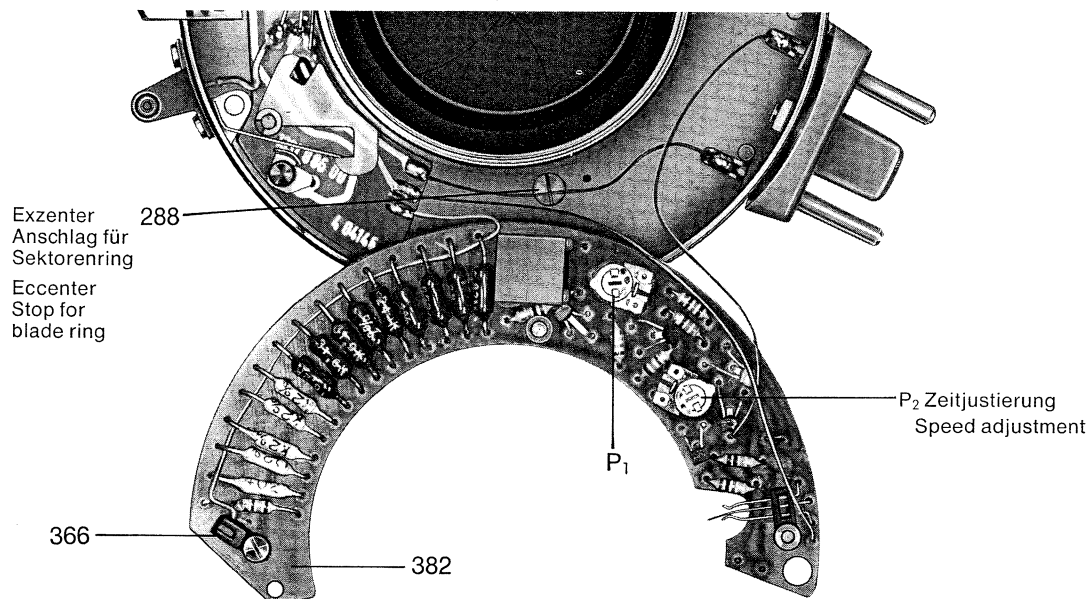


Fig. 2

24

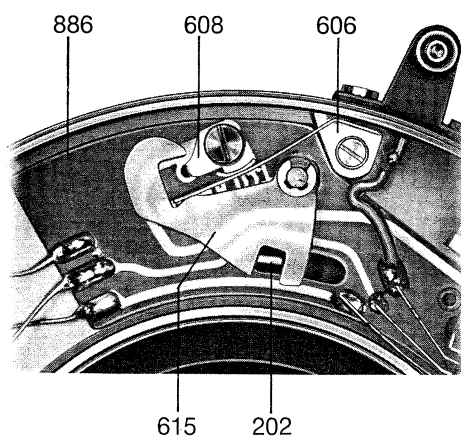


Fig. 3

17

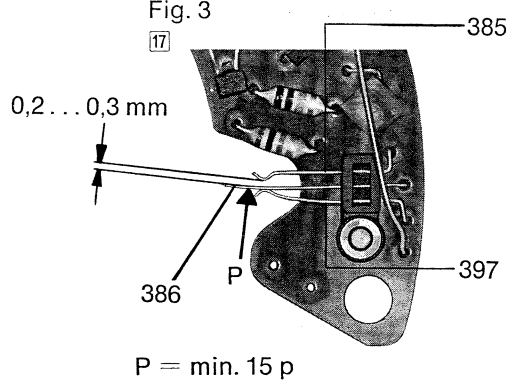


Fig. 4

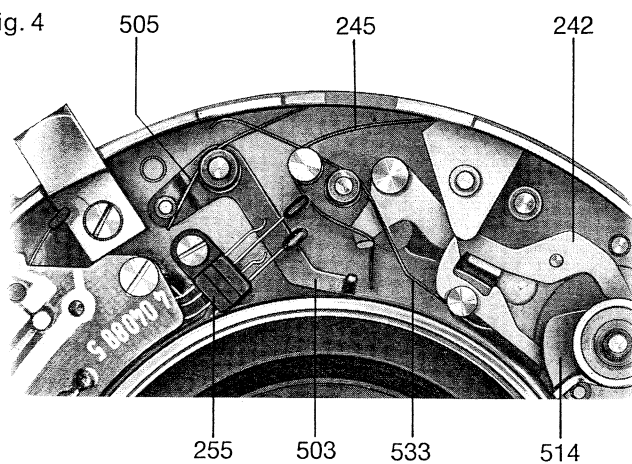
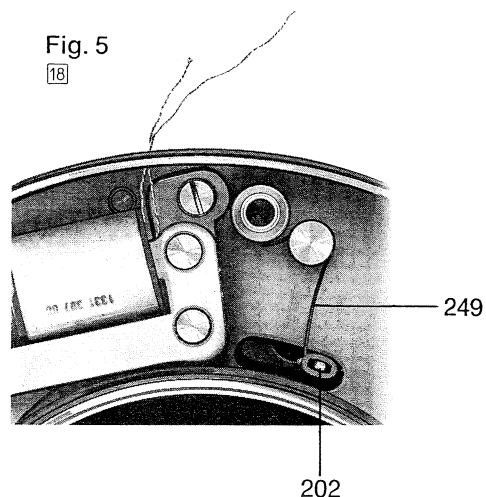


Fig. 5

18



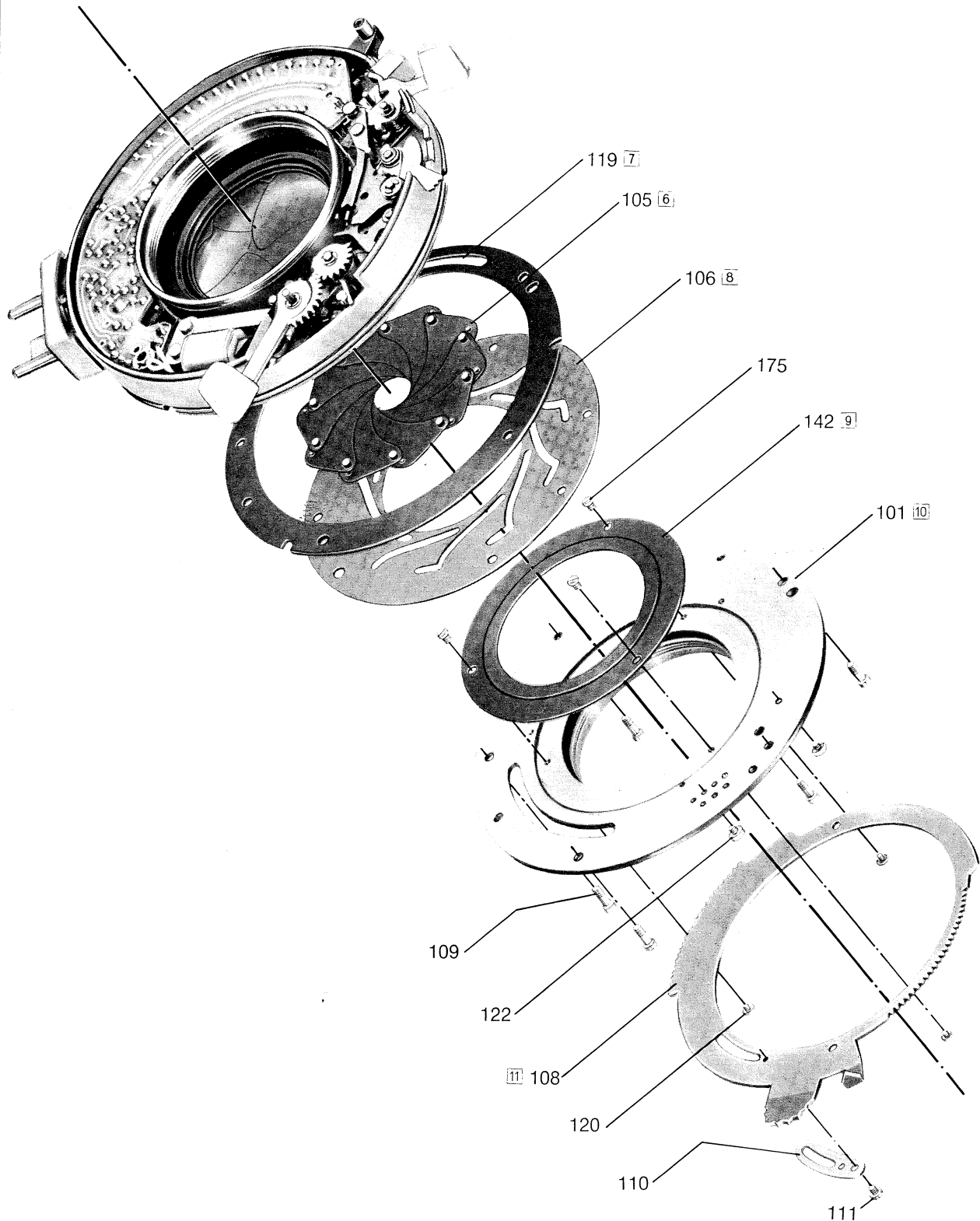
COMPUR

electronic 1

CN - 1331 - 000

Tafel 8
Plate 8

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
 Supplement No. ○ See section □ of instructions for repairs



COMPUR-WERK MÜNCHEN

COMPUR electronic 1

CN-1331-000

Tafel 9
Plate 9

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
 Supplement No. ○ See section □ of instructions for repairs

Fig. 1

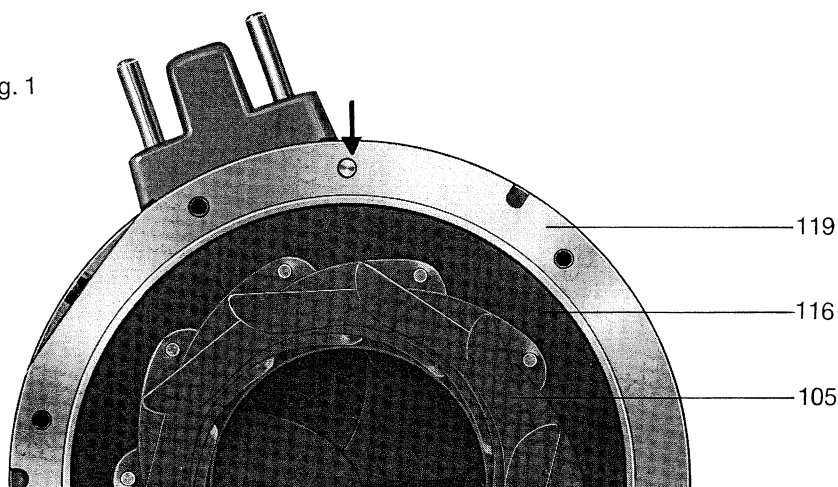


Fig. 2

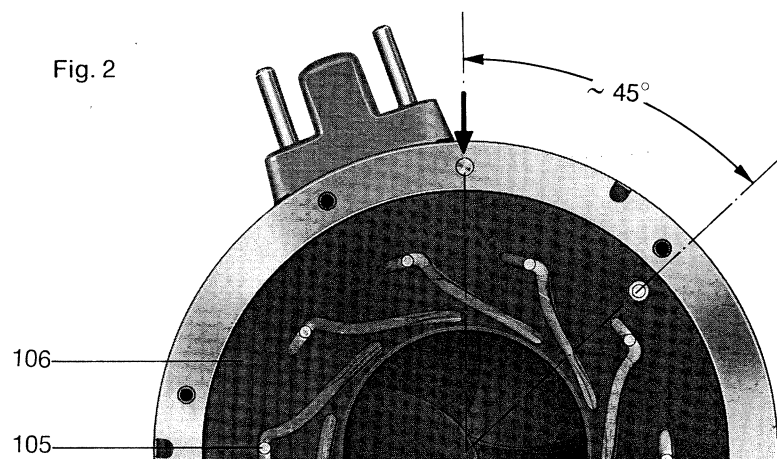
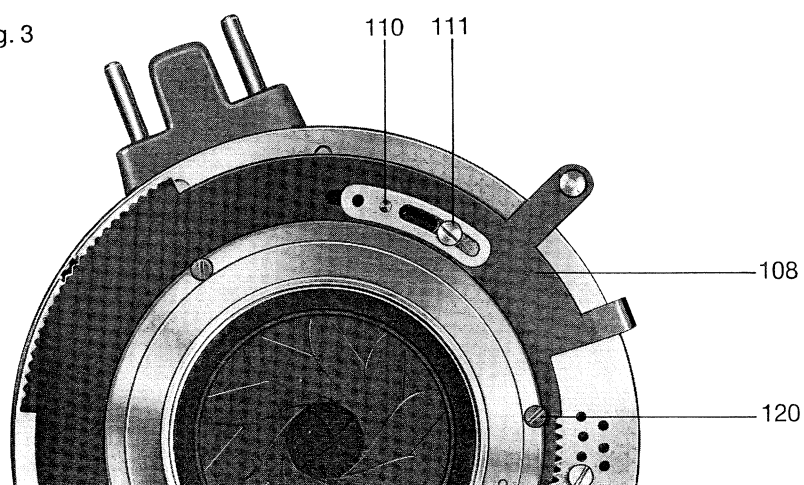


Fig. 3



COMPUR-WERK MÜNCHEN

COMPUR
electronic 1

CN - 1331 - 000

Tafel 10
Plate 10

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
Supplement No. ○ See section □ of instructions for repairs

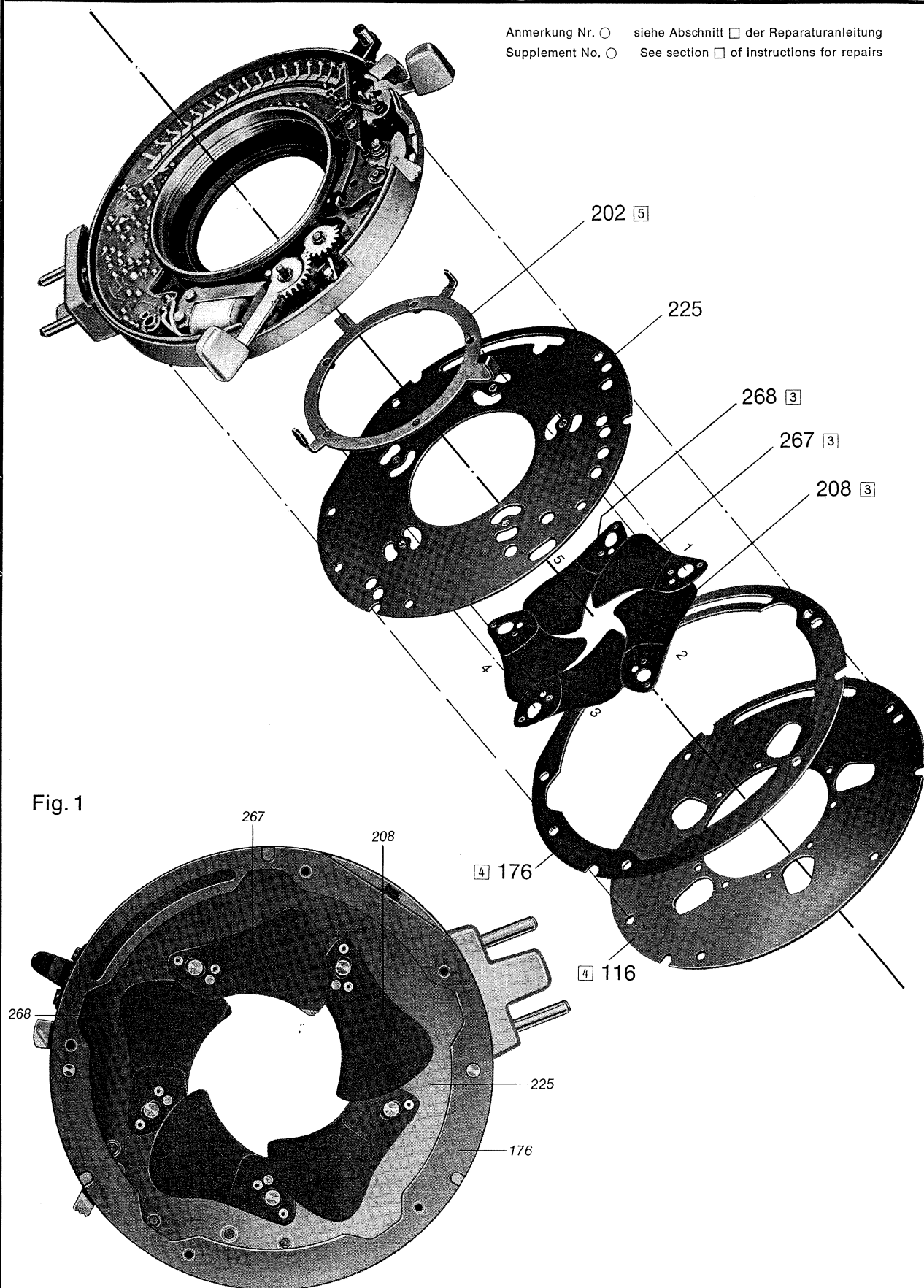
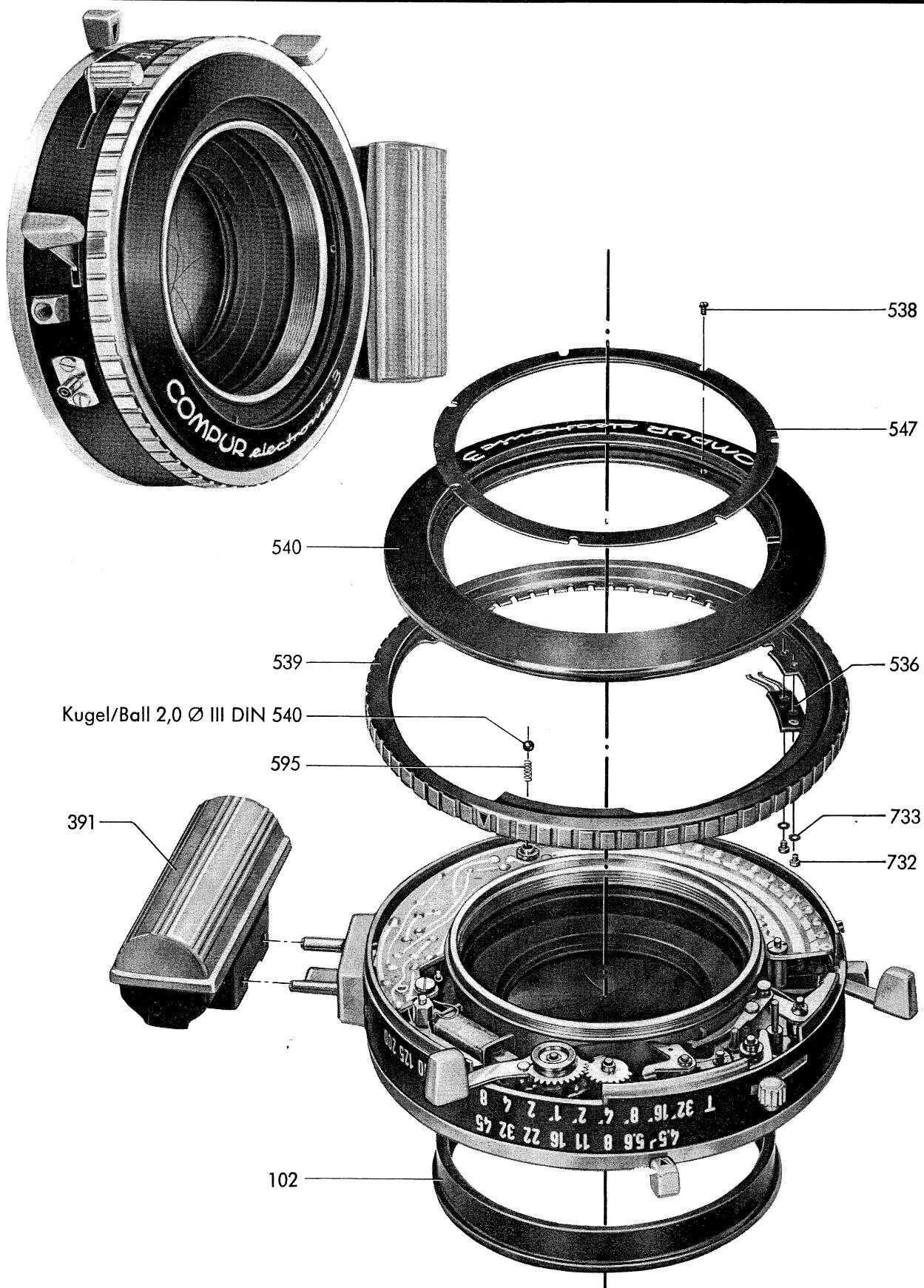


Fig. 1

COMPUR
electronic 3

CN-1531-000

Seite 1



COMPUR-WERK MÜNCHEN

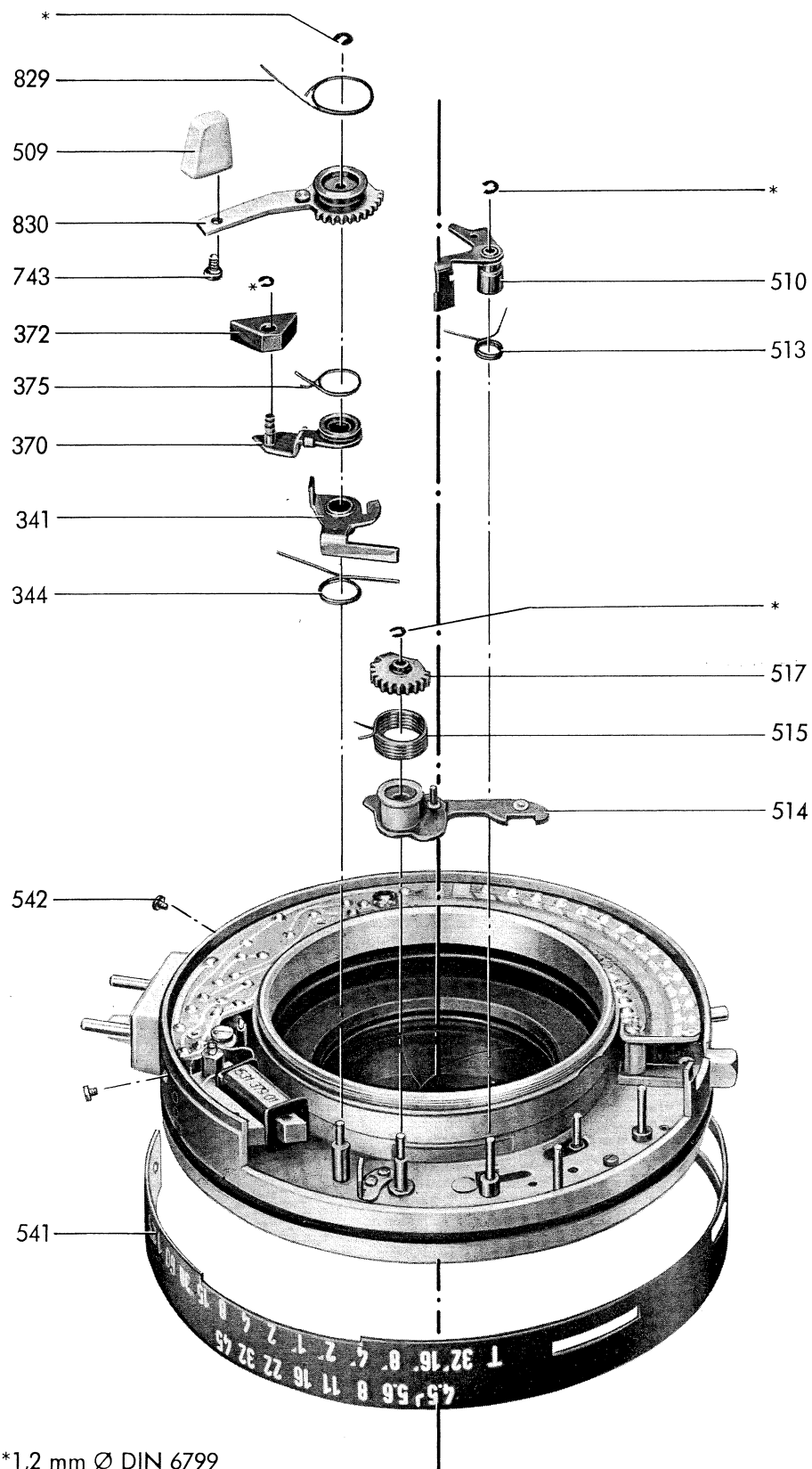


Fig. 1

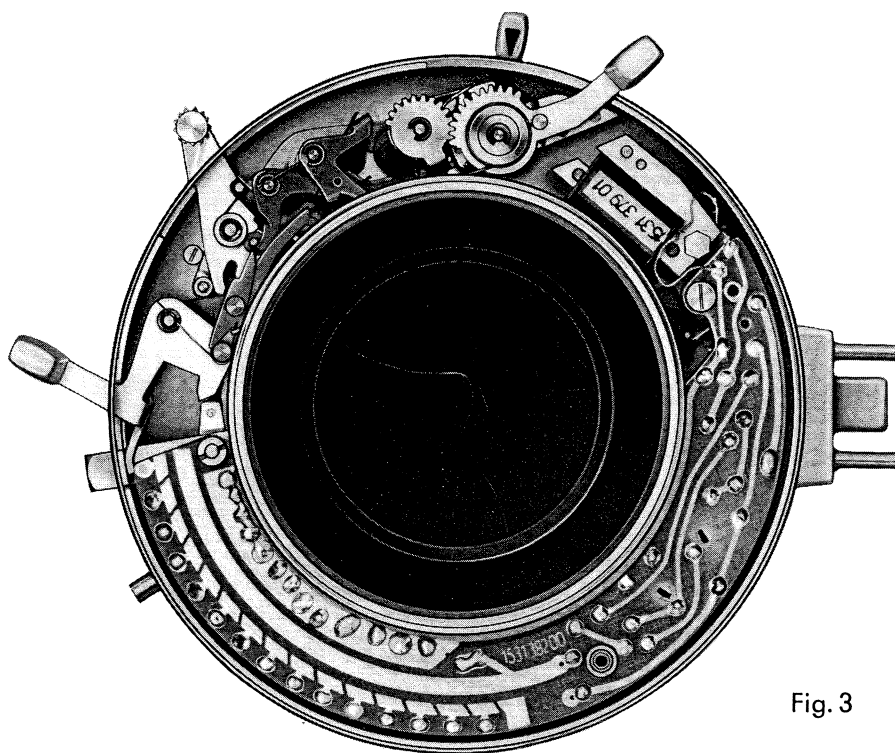


Fig. 2

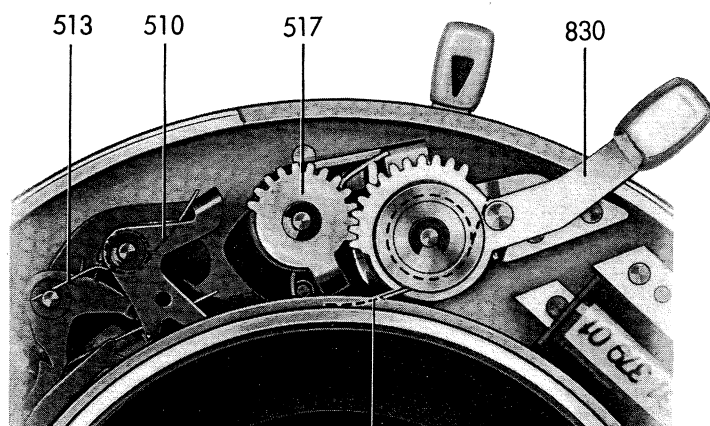


Fig. 4

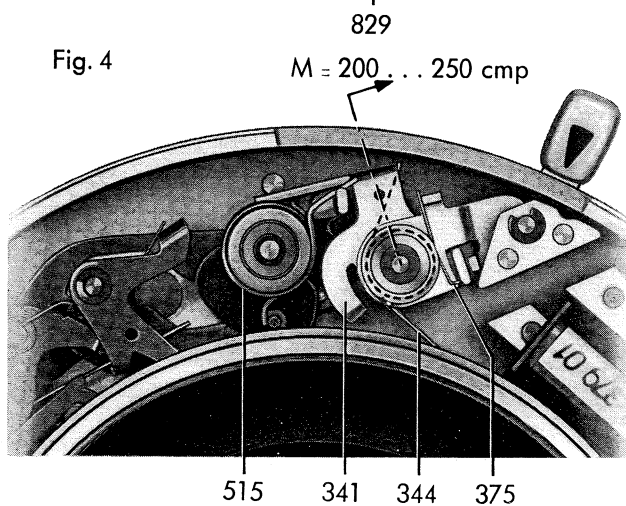


Fig. 3

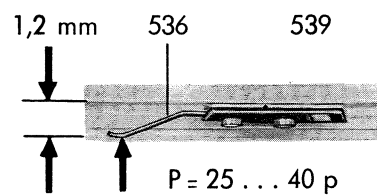
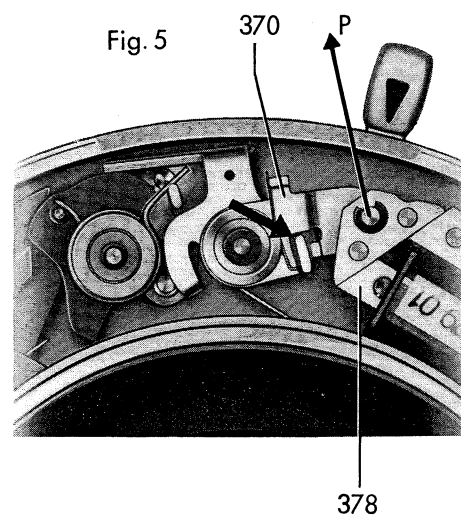


Fig. 5



ohne Batterie $P = 15 \dots 25 \text{ p}$
 without battery

mit Batterie $P = \text{min. } 300 \text{ p}$
 with battery

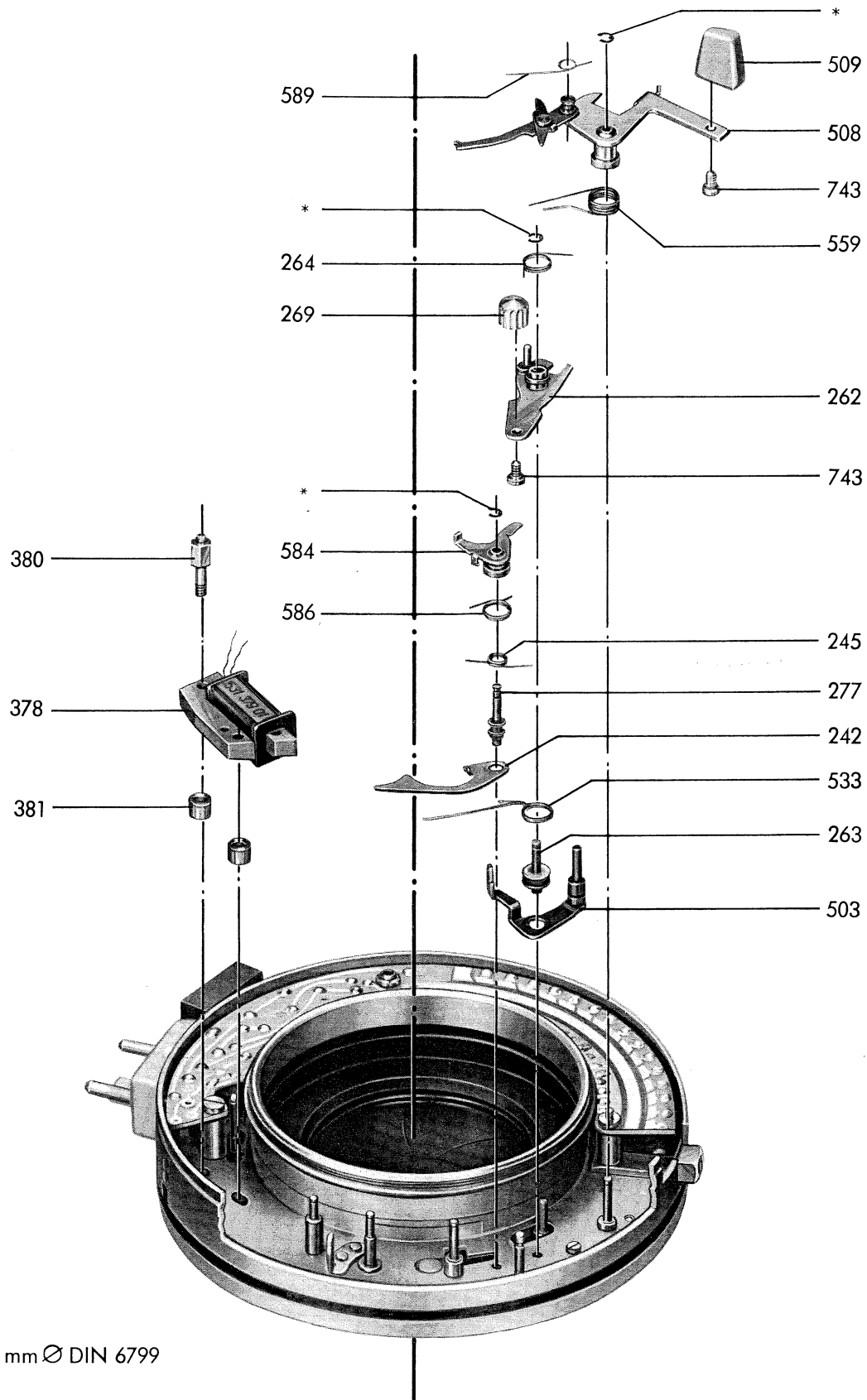


Fig. 1

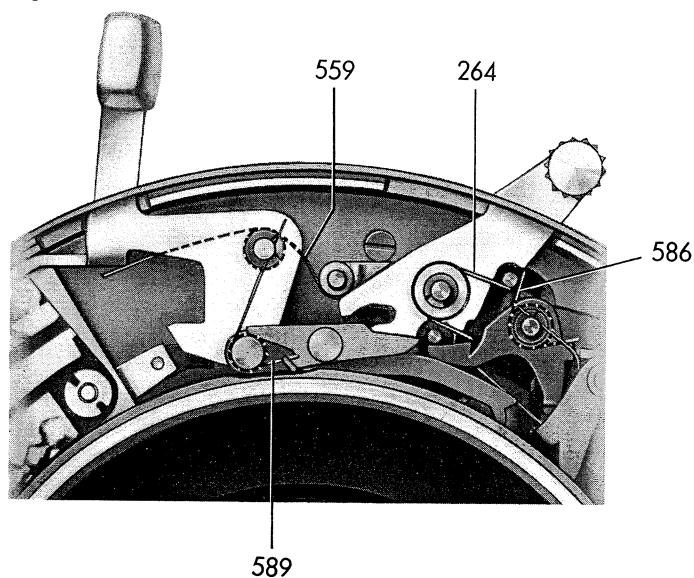


Fig. 2

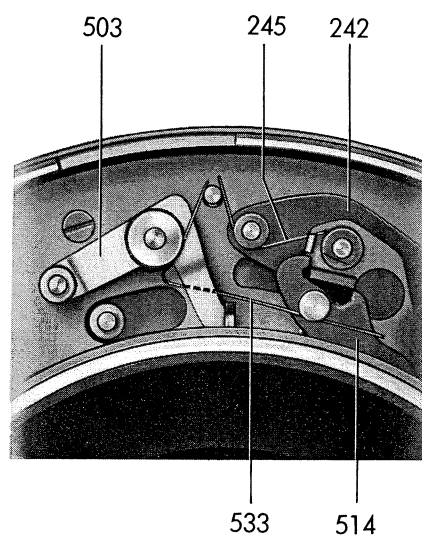


Fig. 3

Stellung bei Auslösebeginn
 position at beginning of
 release action

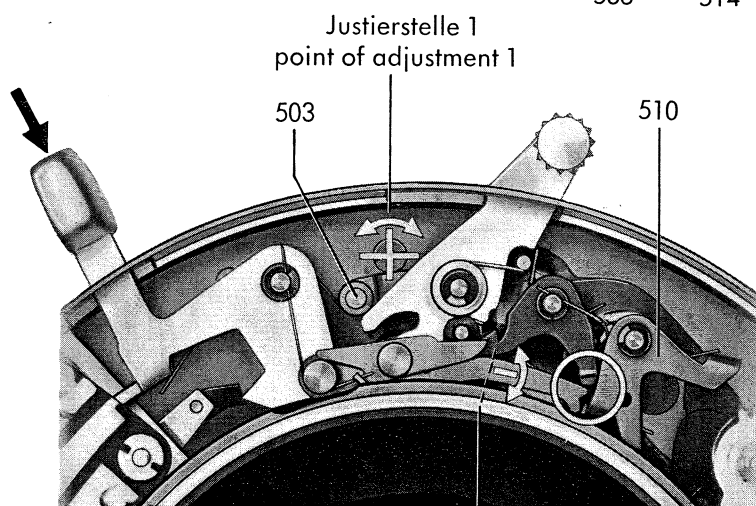
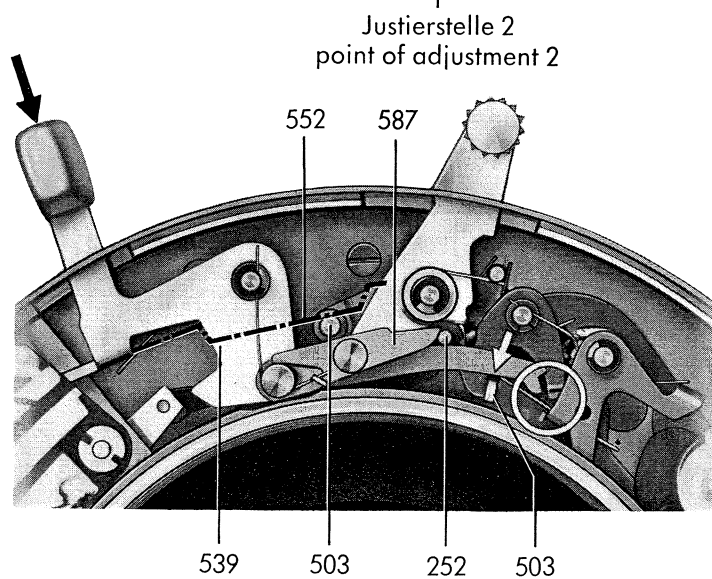


Fig. 4

in Einstellung „T“:
 Öffnen der Sektoren
 opening of blades in
 "T" position



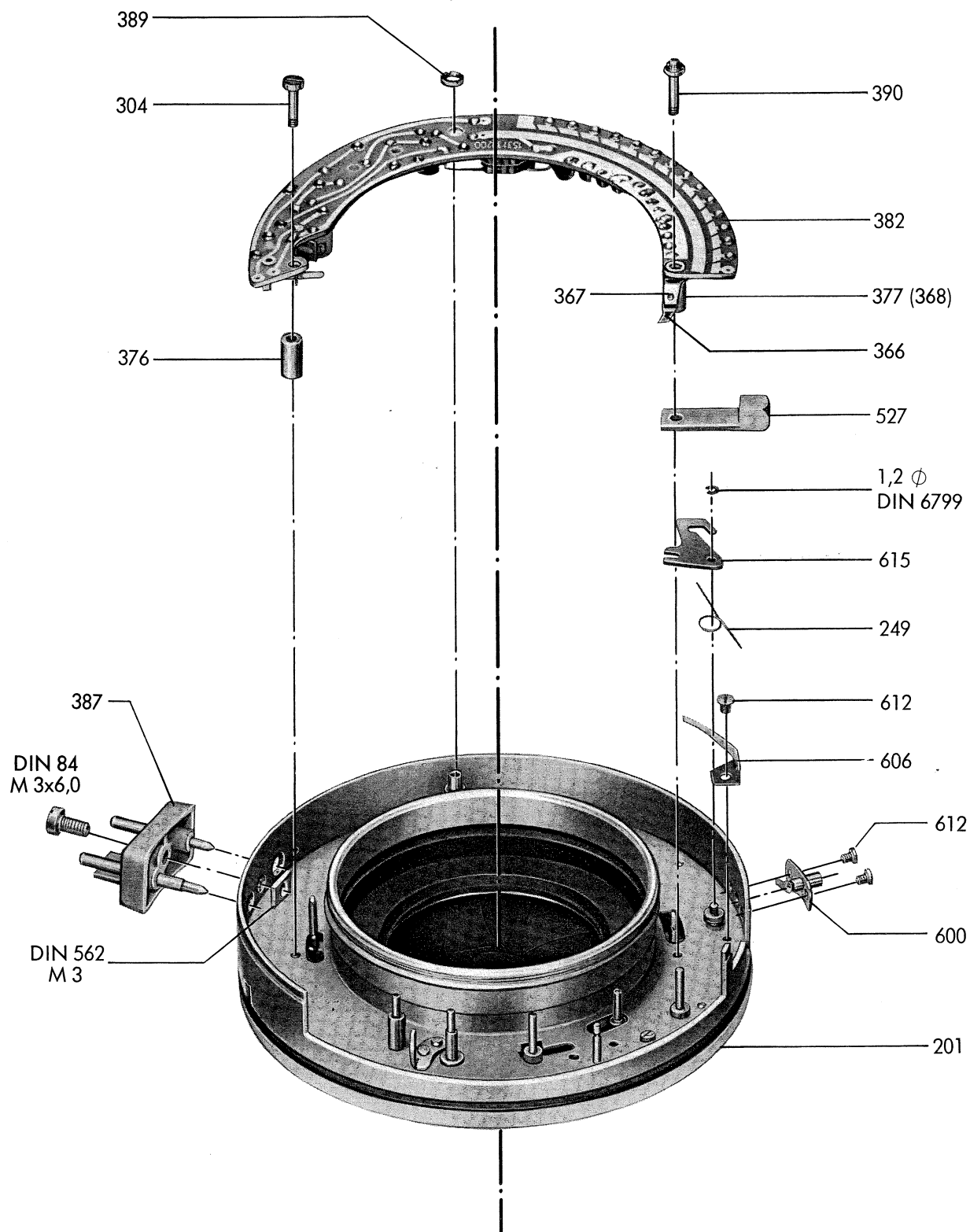


Fig. 1

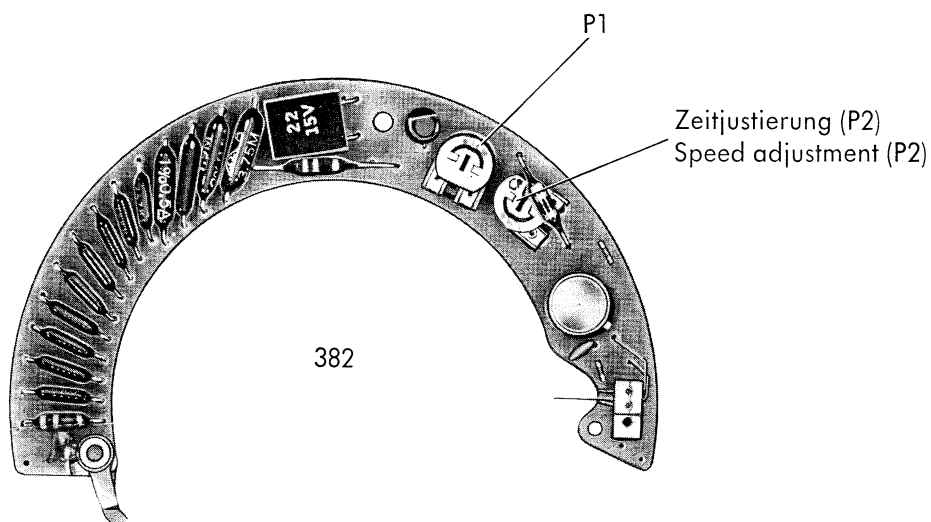
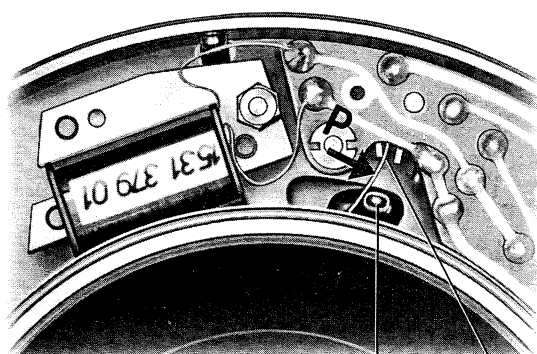


Fig. 2

 Verschuß-Ruhestellung
 Rest position of shutter

 $P = 10 \dots 30 \text{ p}$

202

 Justierstelle
 Point of adjustment

Fig. 4

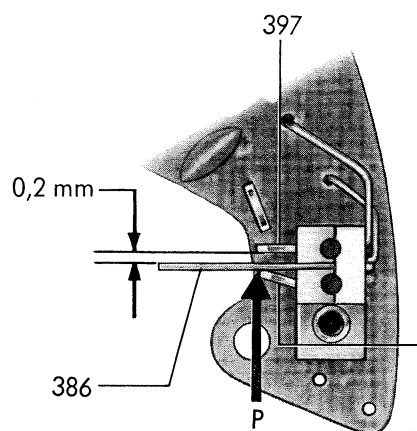
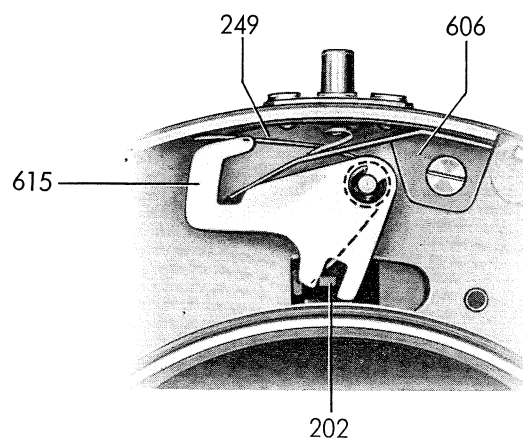

 $P = 25 \dots 40 \text{ p}$

Fig. 3


 X-Kontaktdruck
 X-contact pressure
 $P = \text{min. } 35 \text{ p}$

 bei abgeschalteter
 Sektorenringschließfeder 249

 disengaged
 Blade ring closing spring 249

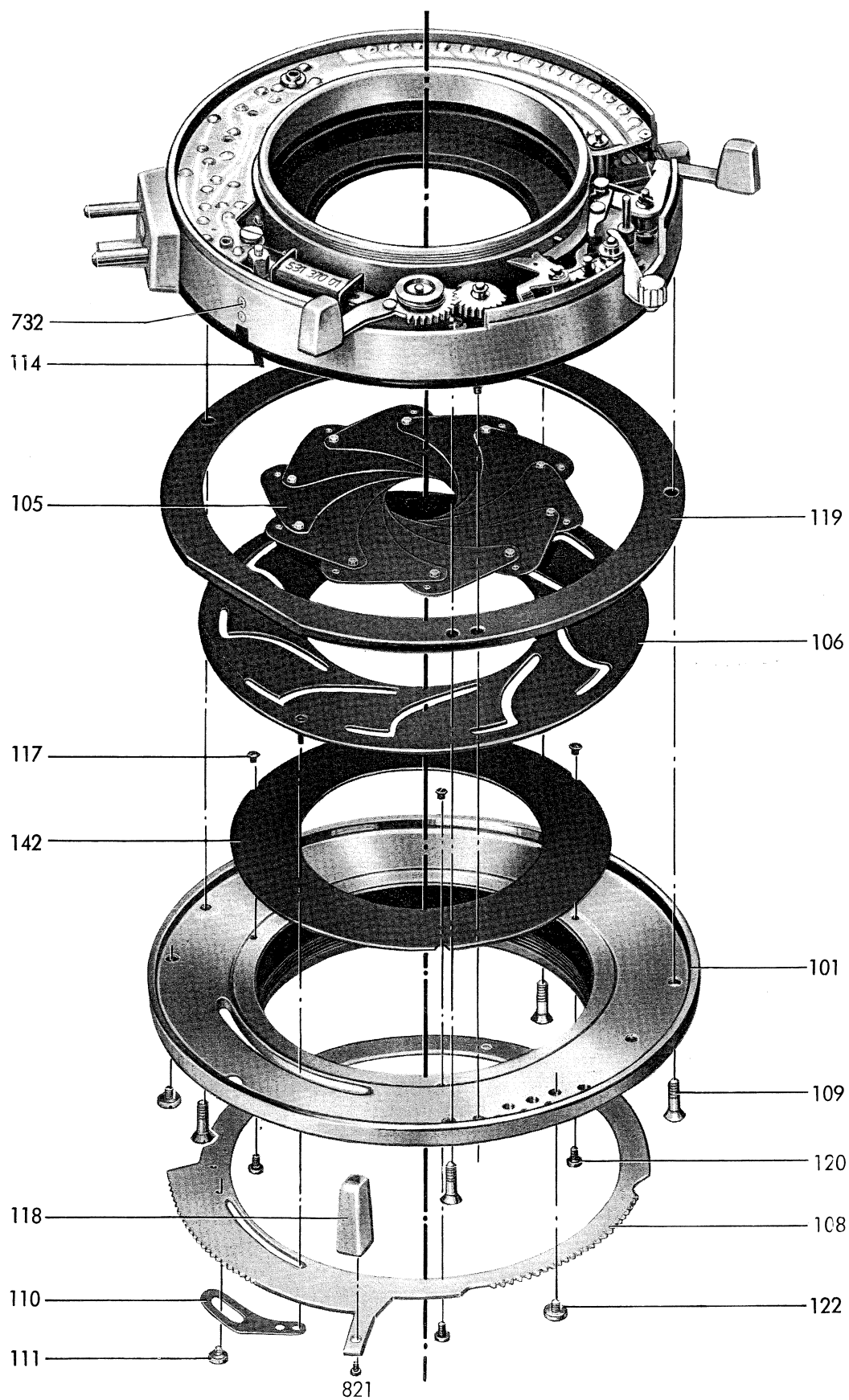


Fig. 1

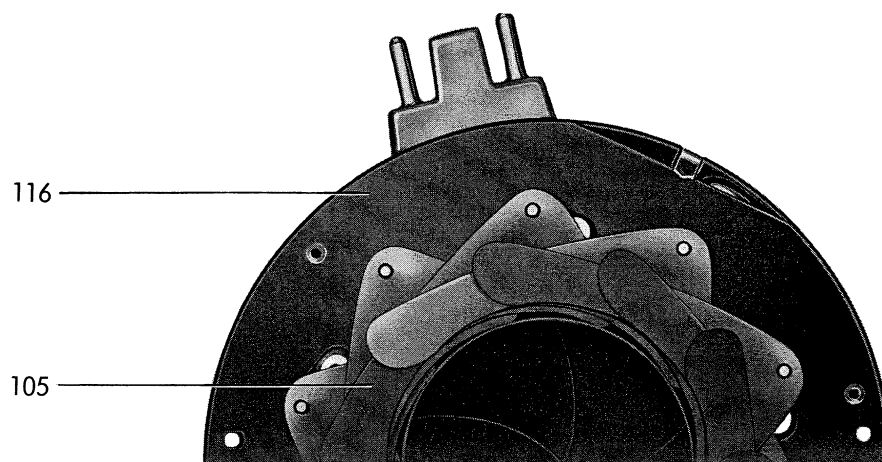


Fig. 2

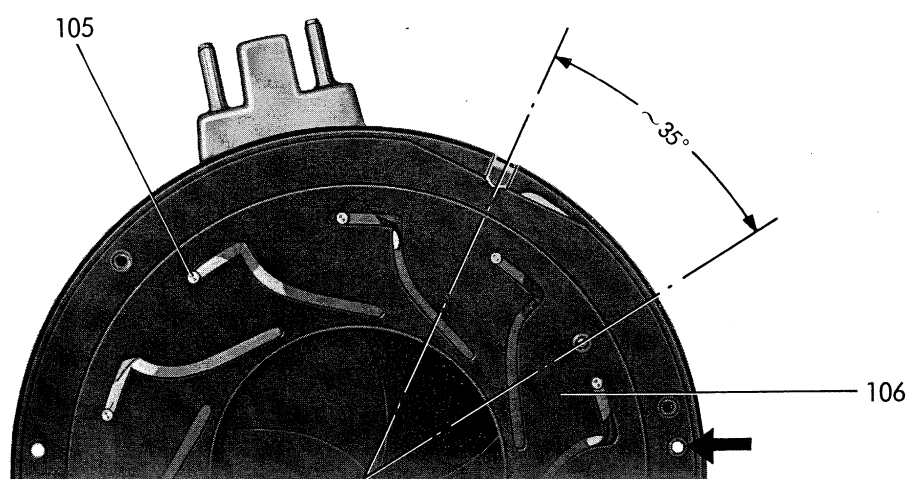
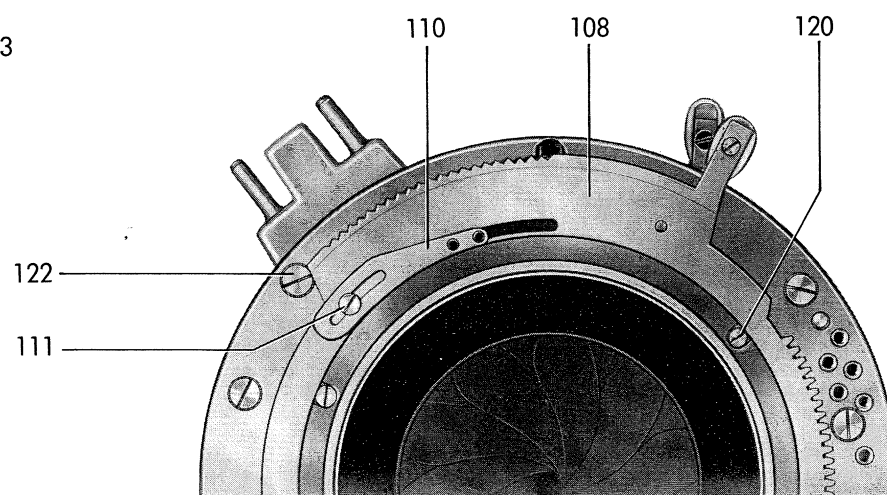


Fig. 3



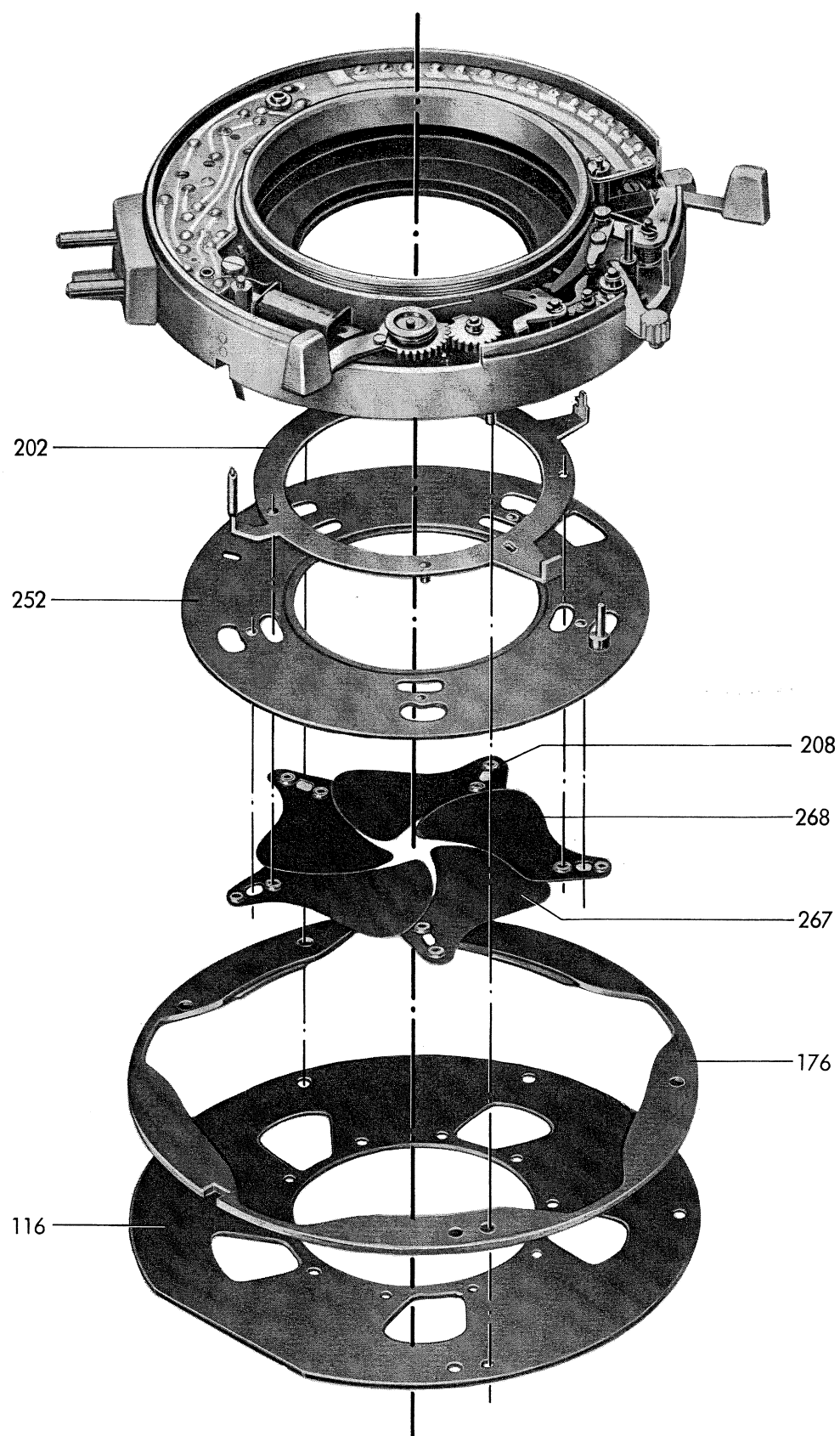


Fig. 1

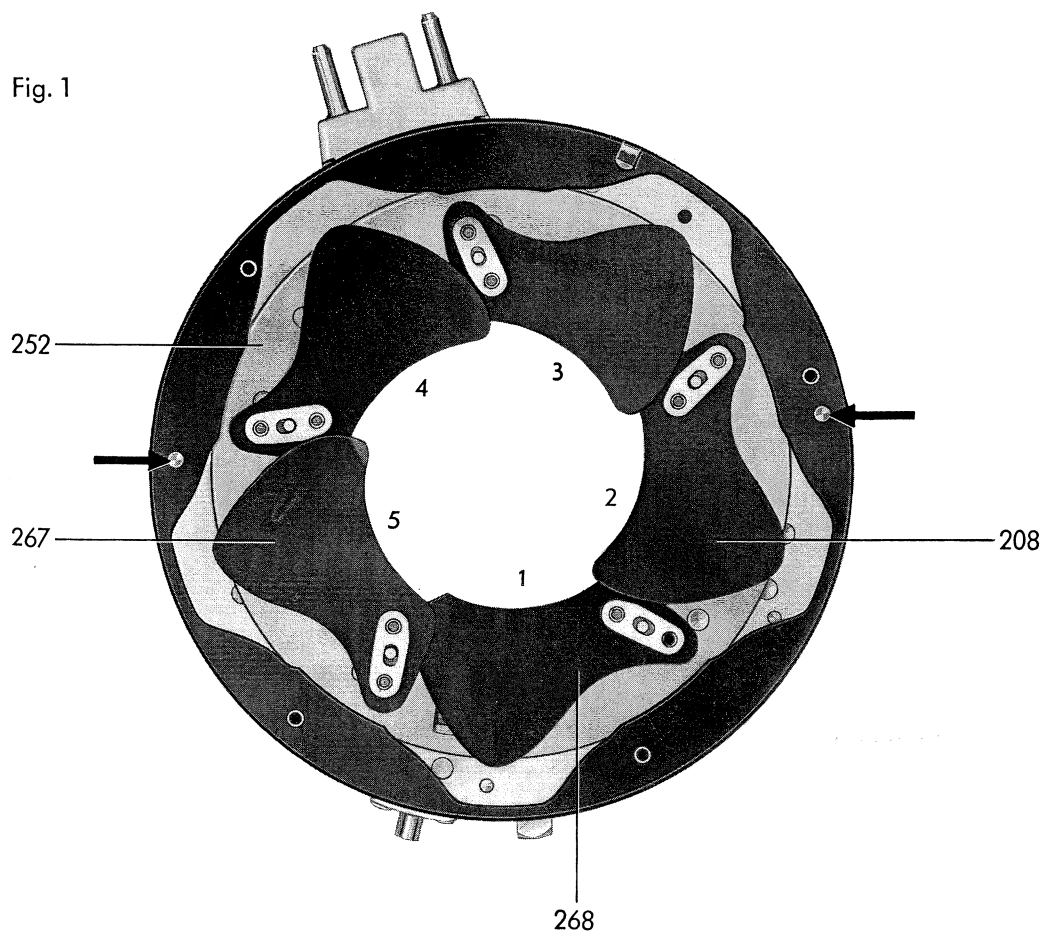
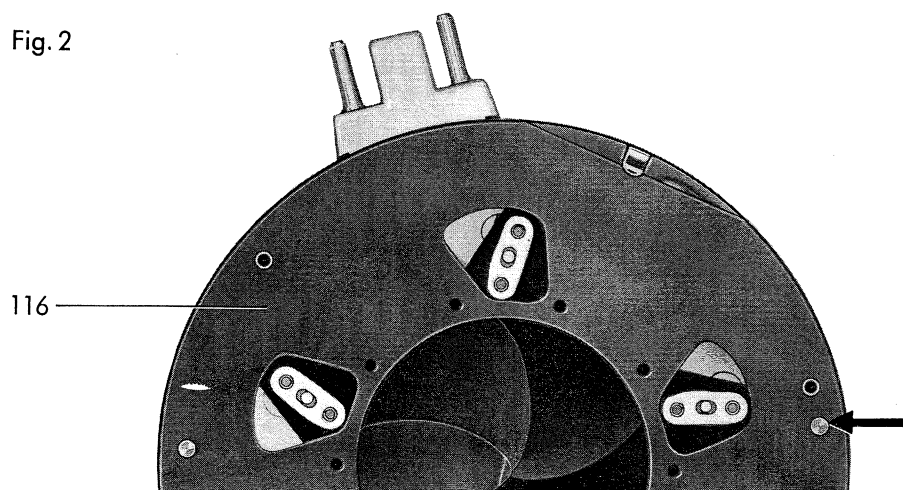


Fig. 2



COMPUR

Blendeneinstellgerät für Verschuß electronic 3
Aperture control unit for shutter electronic 3

CN-1531-801**bis 1531-804**

Seite 1

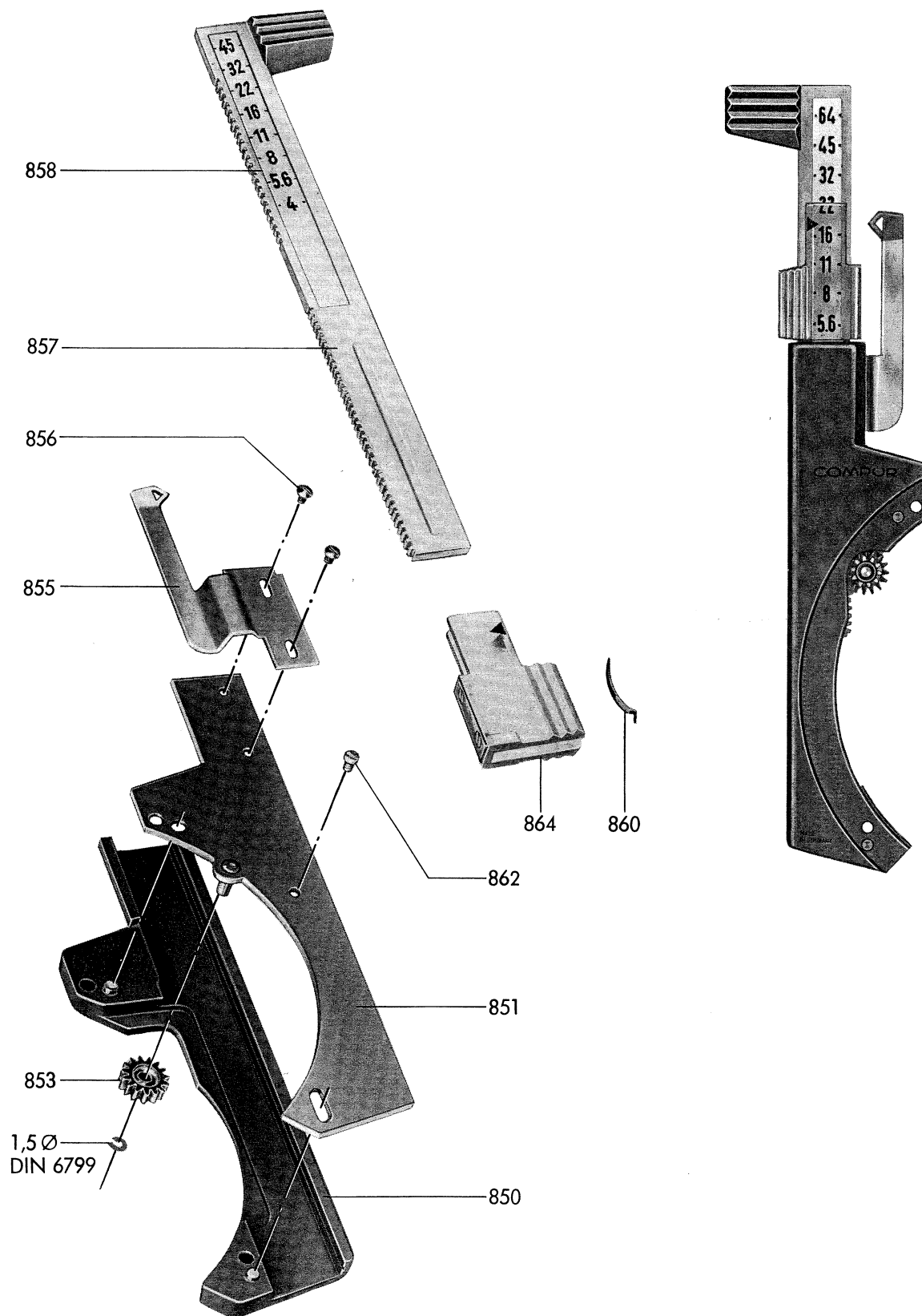
**COMPUR-WERK MÜNCHEN**

Fig. 1

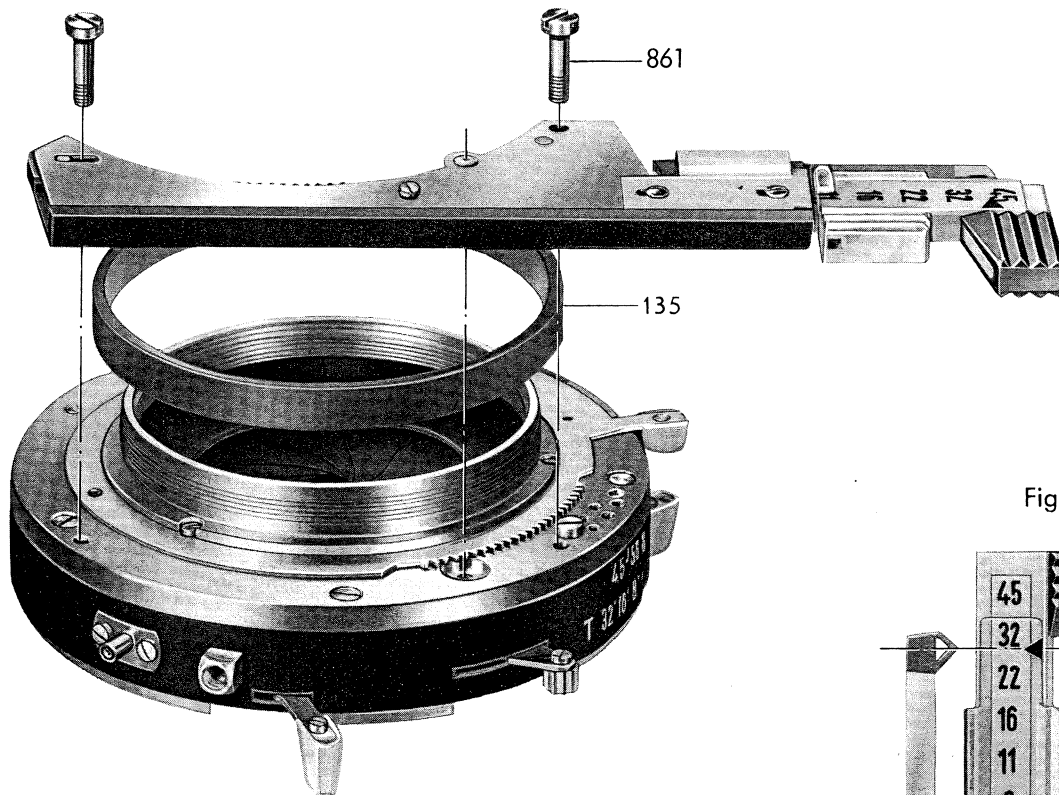


Fig. 3

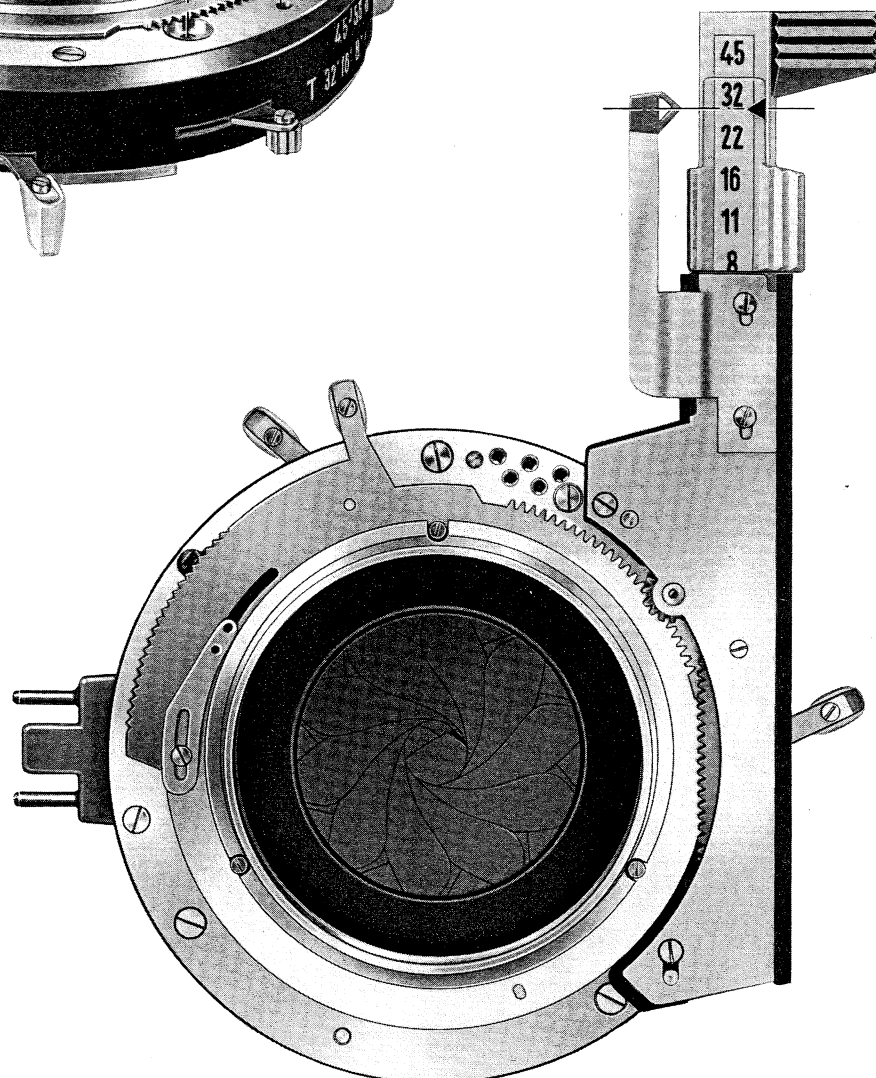
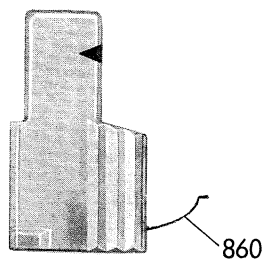


Fig. 2

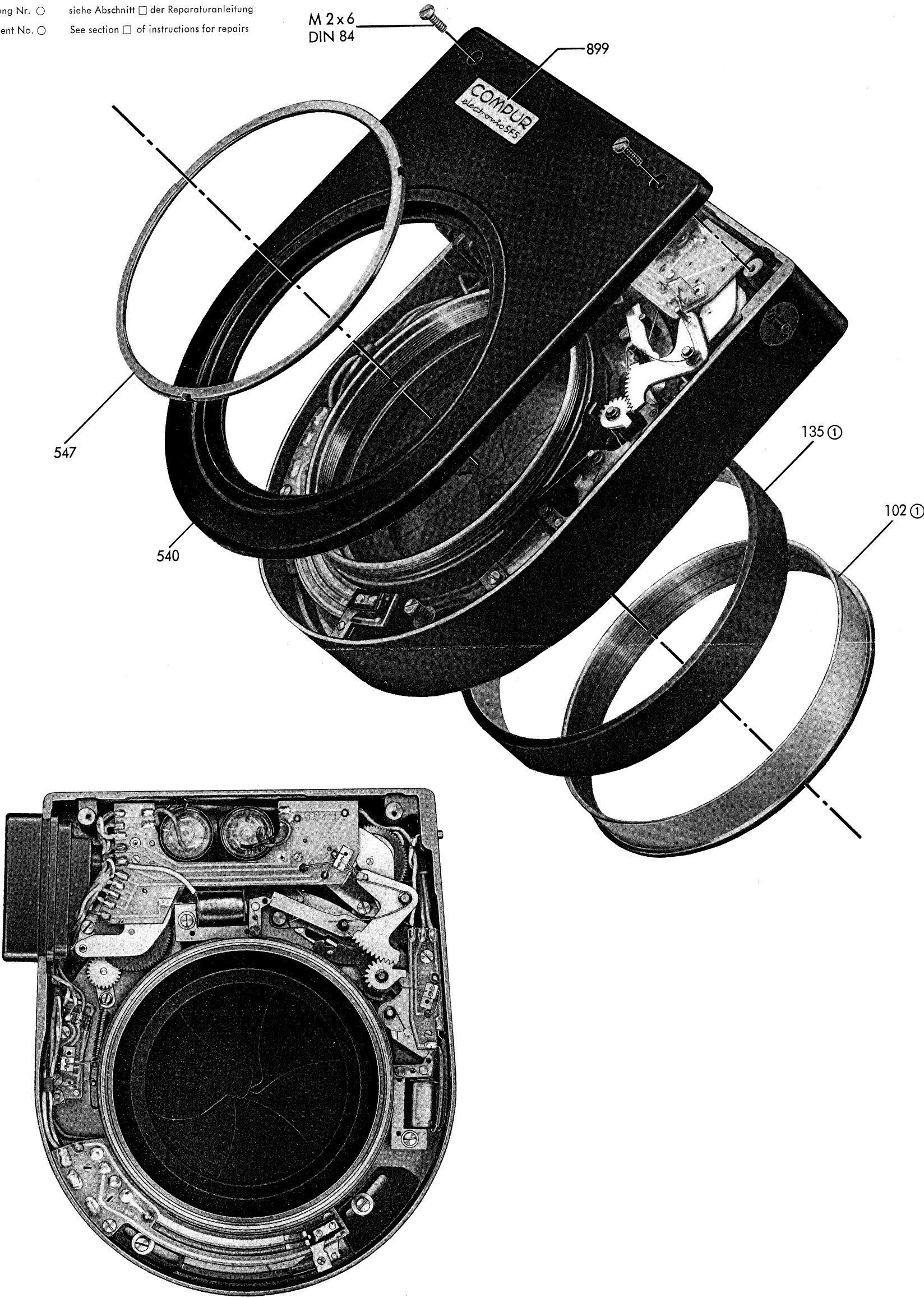


COMPUR electronic 5 FS

CN-1732-000
Tafel / Plate 1

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
Supplement No. ○ See section □ of instructions for repairs

M 2 x 6
DIN 84



COMPUR-WERK MÜNCHEN

COMPUR electronic 5 FS
Antriebs- und Hemmsystem / Drive mechanism and escapement

CN-1732-000
Tafel / Plate 2

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
 Supplement No. ○ See section □ of instructions for repairs

* 1,5 Ø DIN 6799

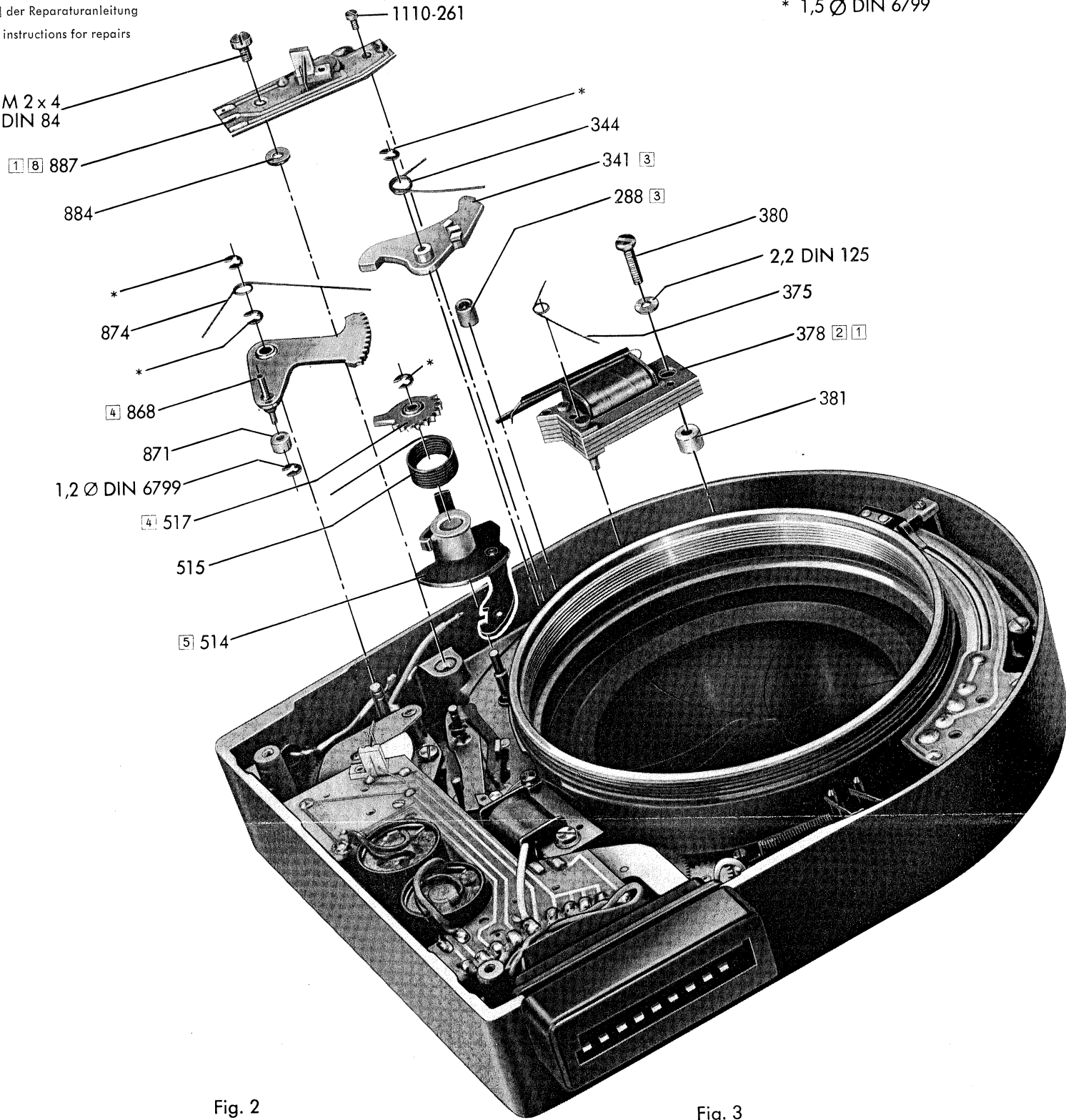


Fig. 1
 Verschluß in Offenstellung
 Open position of Shutter

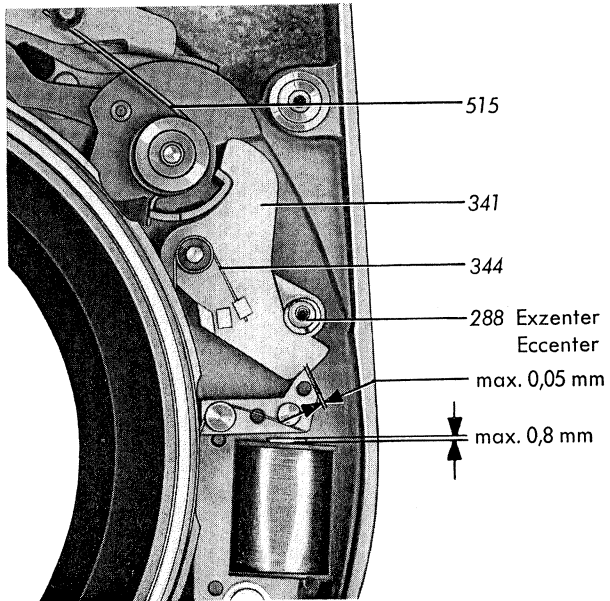


Fig. 2
 Schaltfolge beim Spannen
 Sequence of switching operations during tensioning
 Schalter M darf erst öffnen, wenn A geschlossen ist
 Switch M must open only after switch A has closed

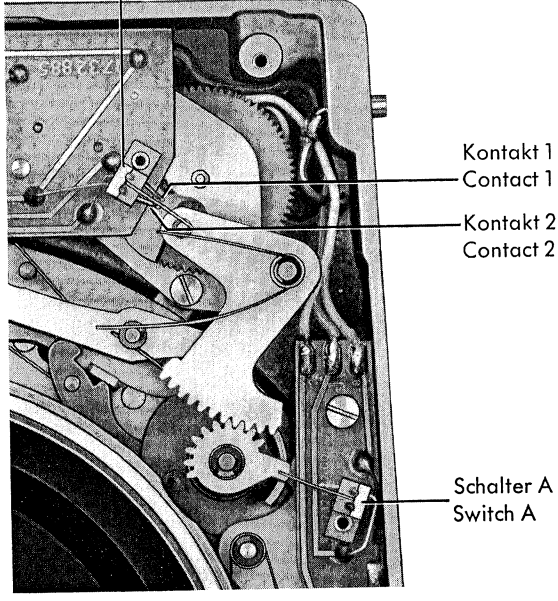
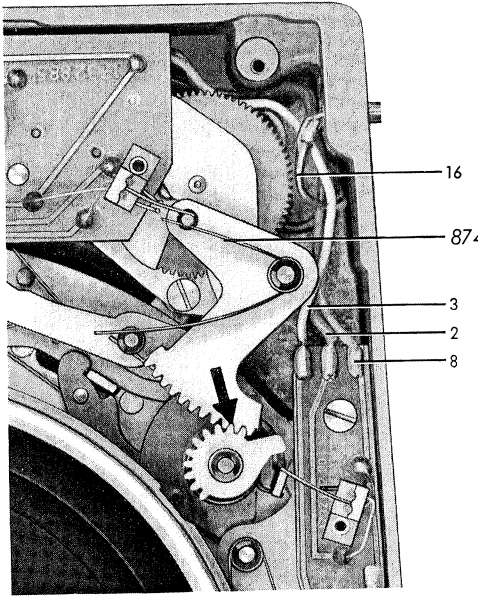


Fig. 3
 Verschluß nicht gespannt
 Shutter untensioned



COMPUR-WERK MÜNCHEN

COMPUR electronic 5 FS
Auslösesystem, Motoren und Steckbuchse / Release system, motors and socket

CN-1732-000
Tafel / Plate 3

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
Supplement No. ○ See section □ of instructions for repairs

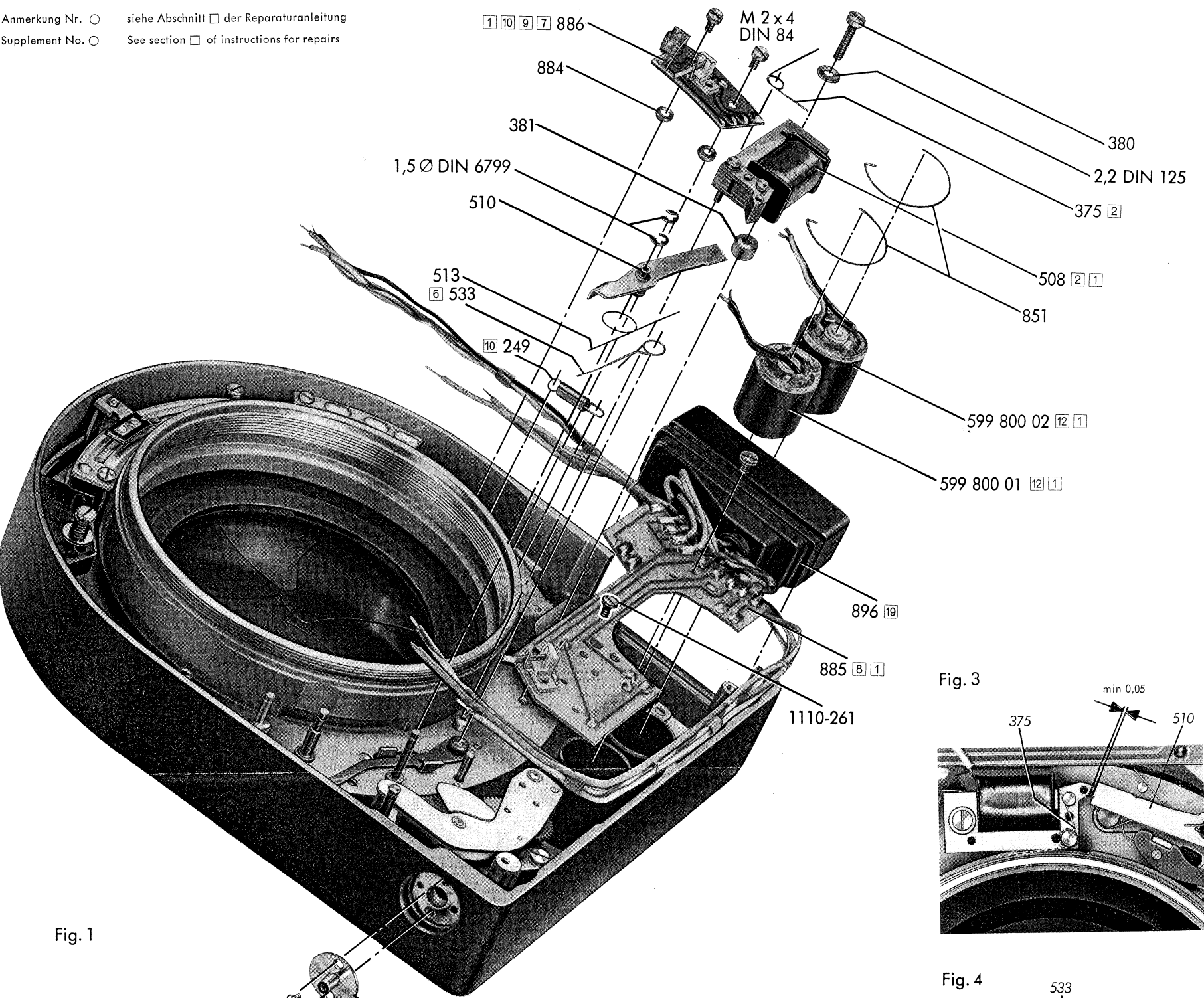


Fig. 1

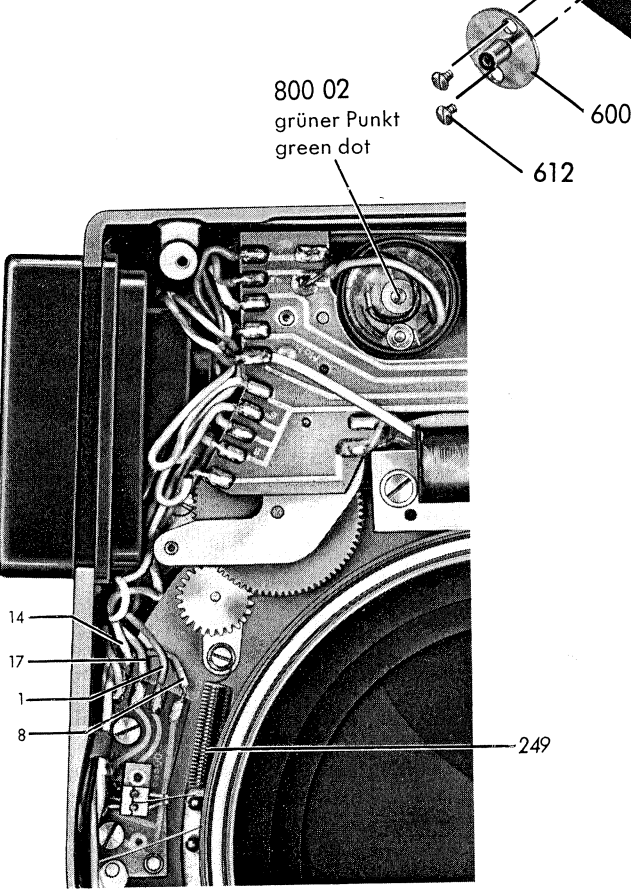
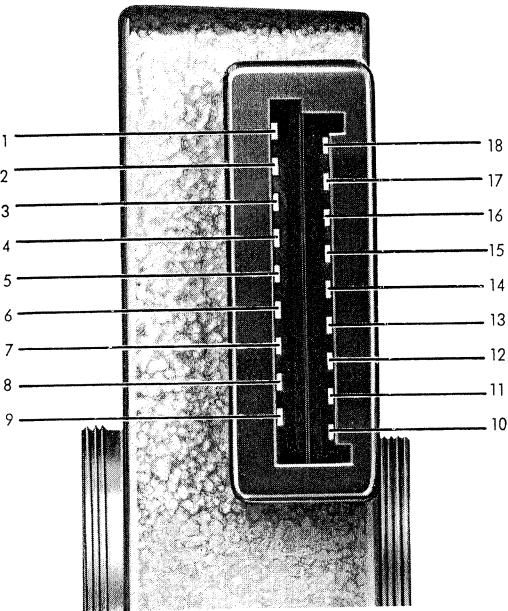


Fig. 2 19



Farbcode siehe Rep. Anl. Abschnitt 19
Color code see repair instruction section 19

Fig. 3

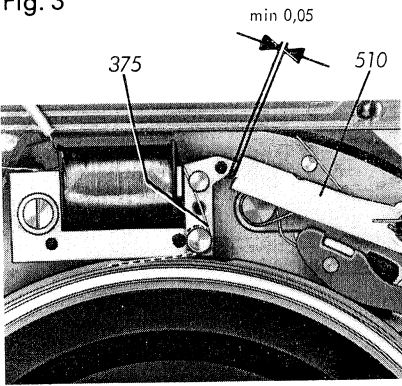


Fig. 4

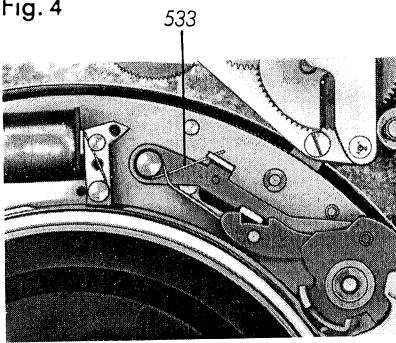
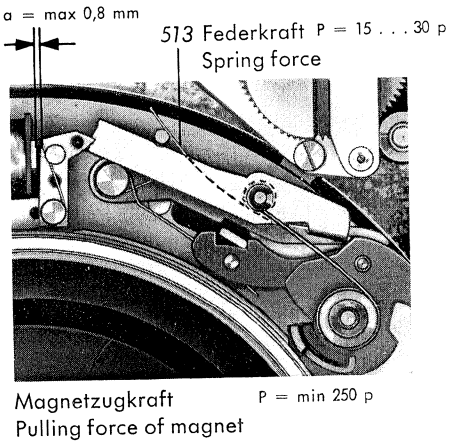


Fig. 5

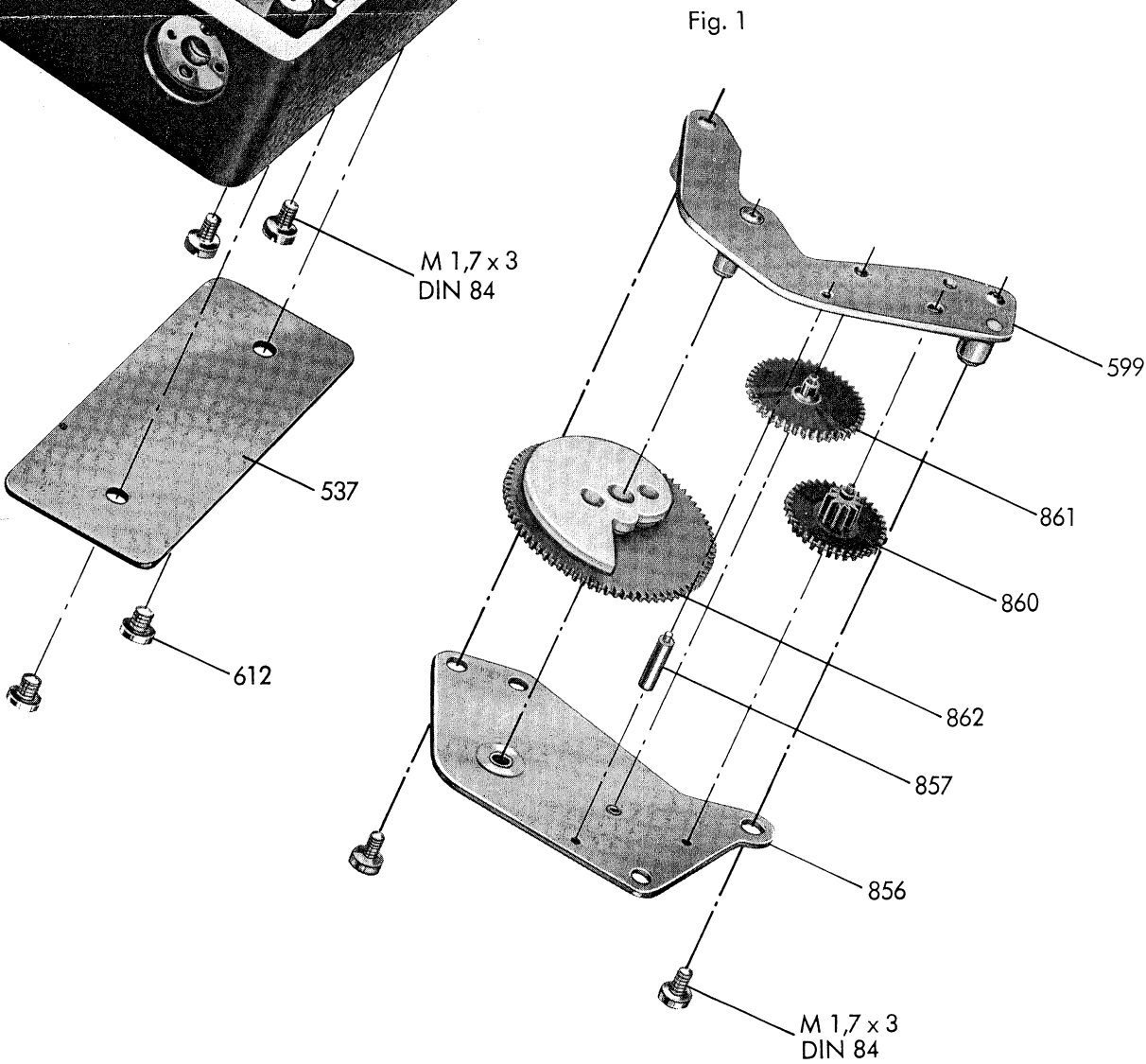
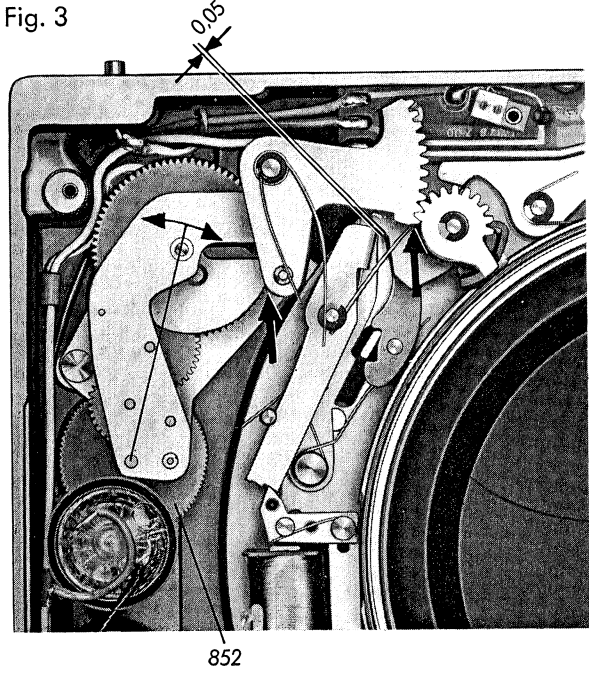
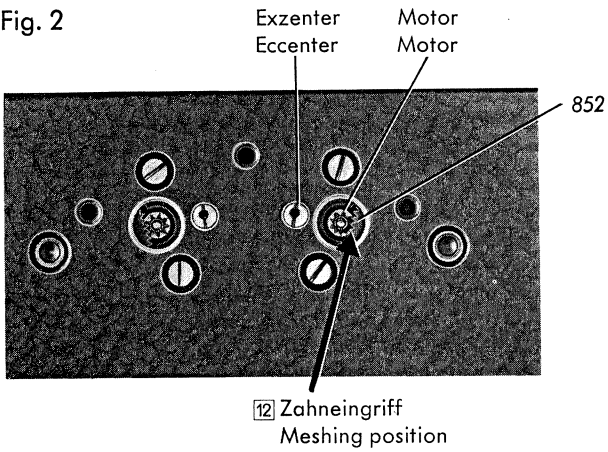
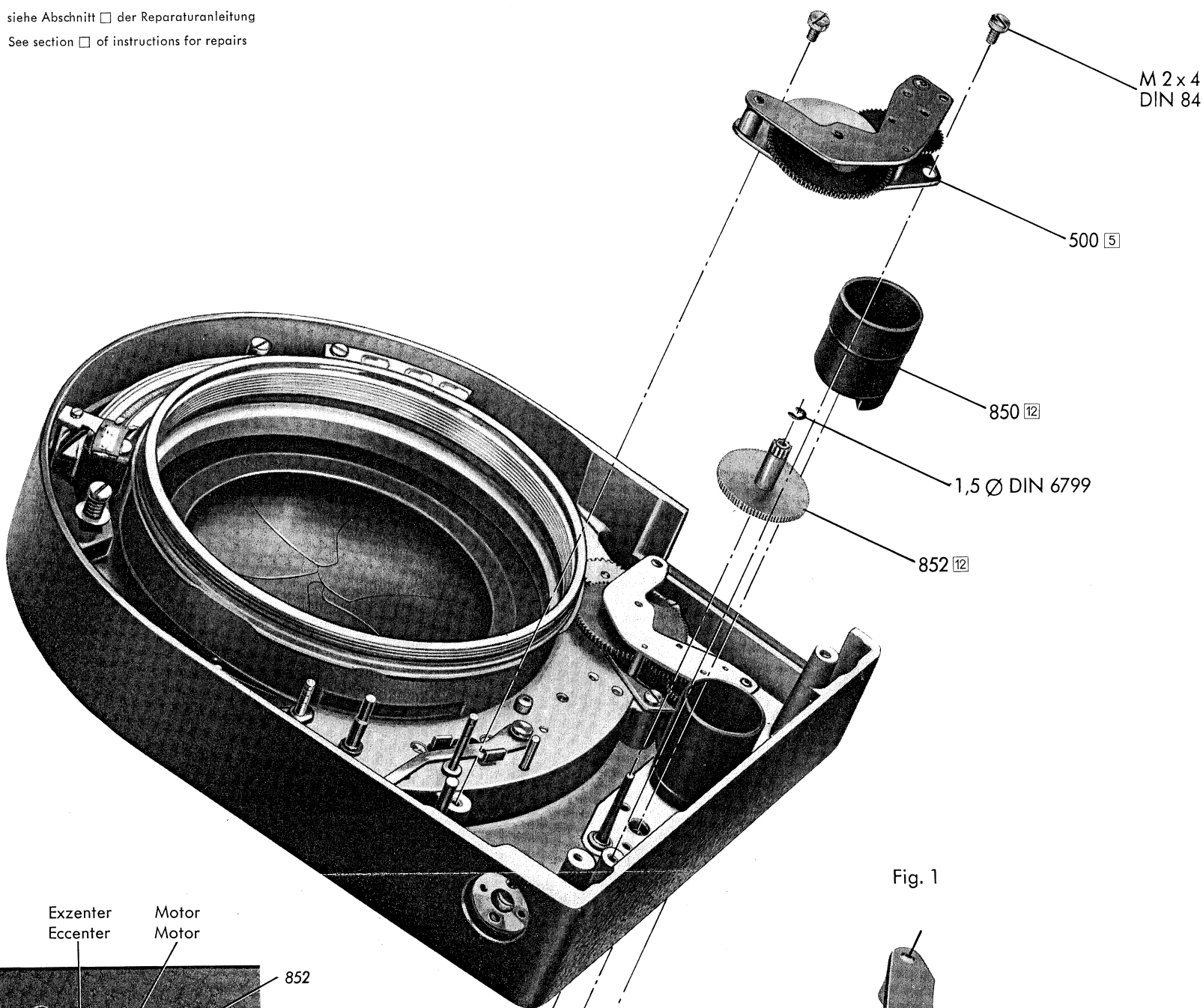


COMPUR-WERK MÜNCHEN

COMPUR electronic 5 FS
Spanngetriebe / Tensioning gear

CN-1732-000
Tafel / Plate 4

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
Supplement No. ○ See section □ of instructions for repairs



COMPUR electronic 5 FS
Blendengetriebe / Diaphragm gear

CN-1732-000
Tafel / Plate 5

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
Supplement No. ○ See section □ of instructions for repairs

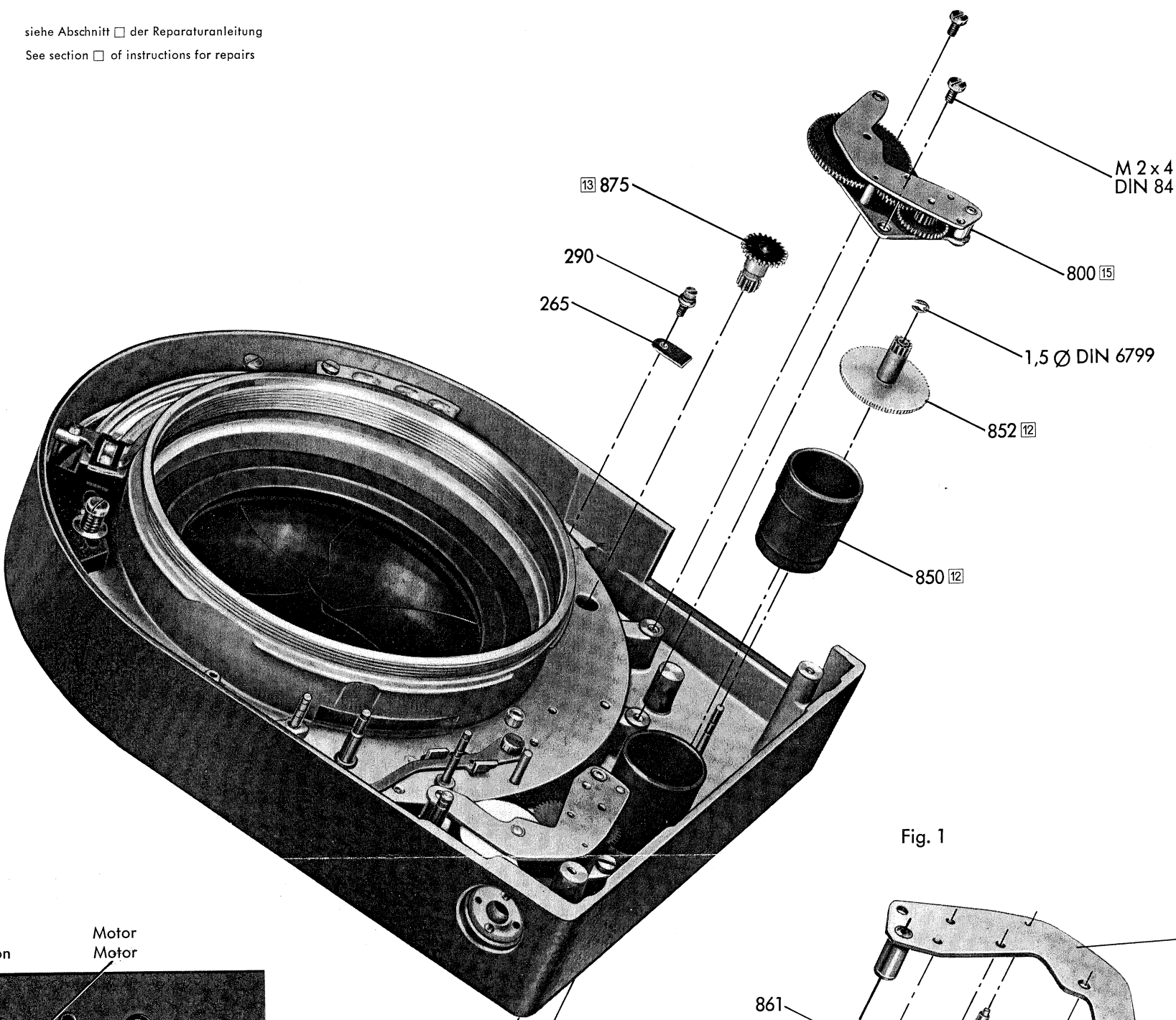


Fig. 2

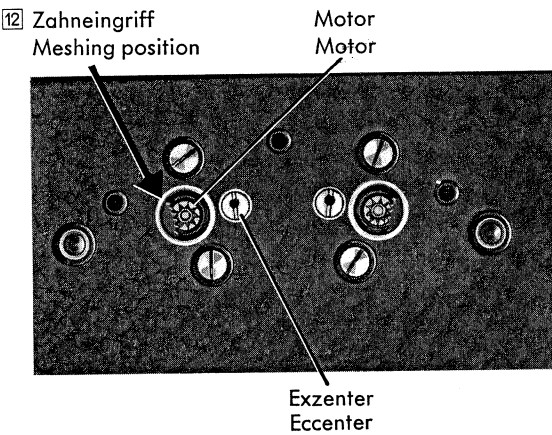


Fig. 3

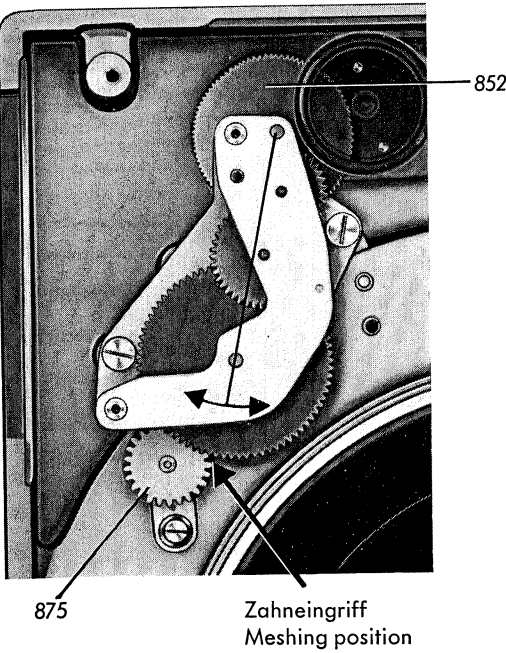
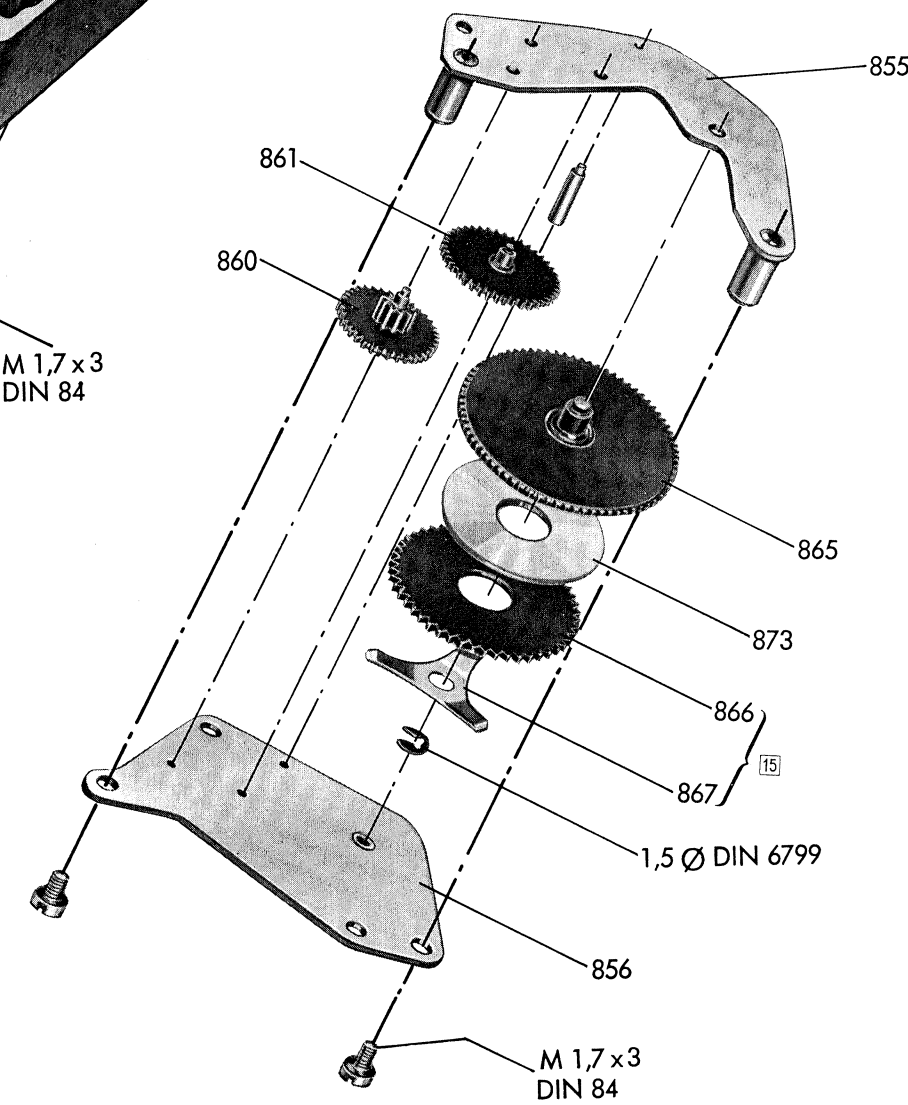


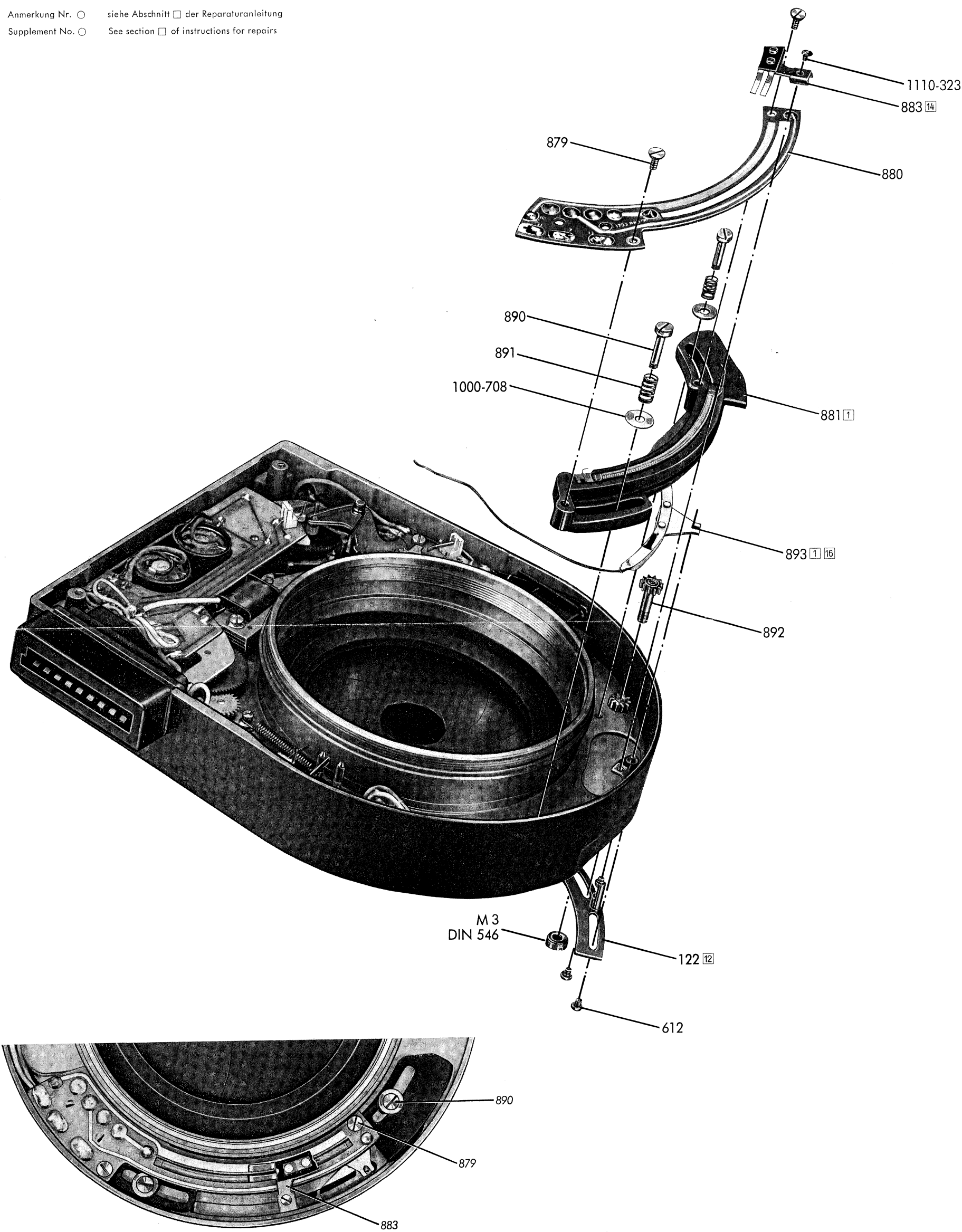
Fig. 1



COMPUR electronic 5 FS
Blendenpotentiometer/Diaphragm potentiometer

CN-1732-000
Tafel/Plate 6

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
Supplement No. ○ See section □ of instructions for repairs

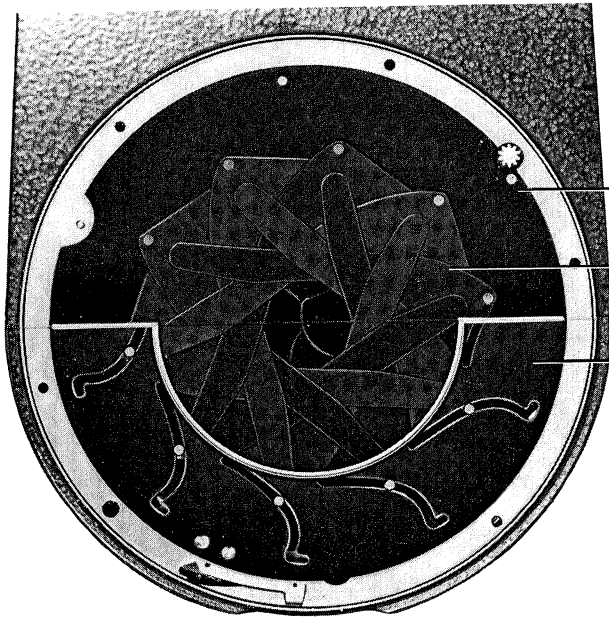
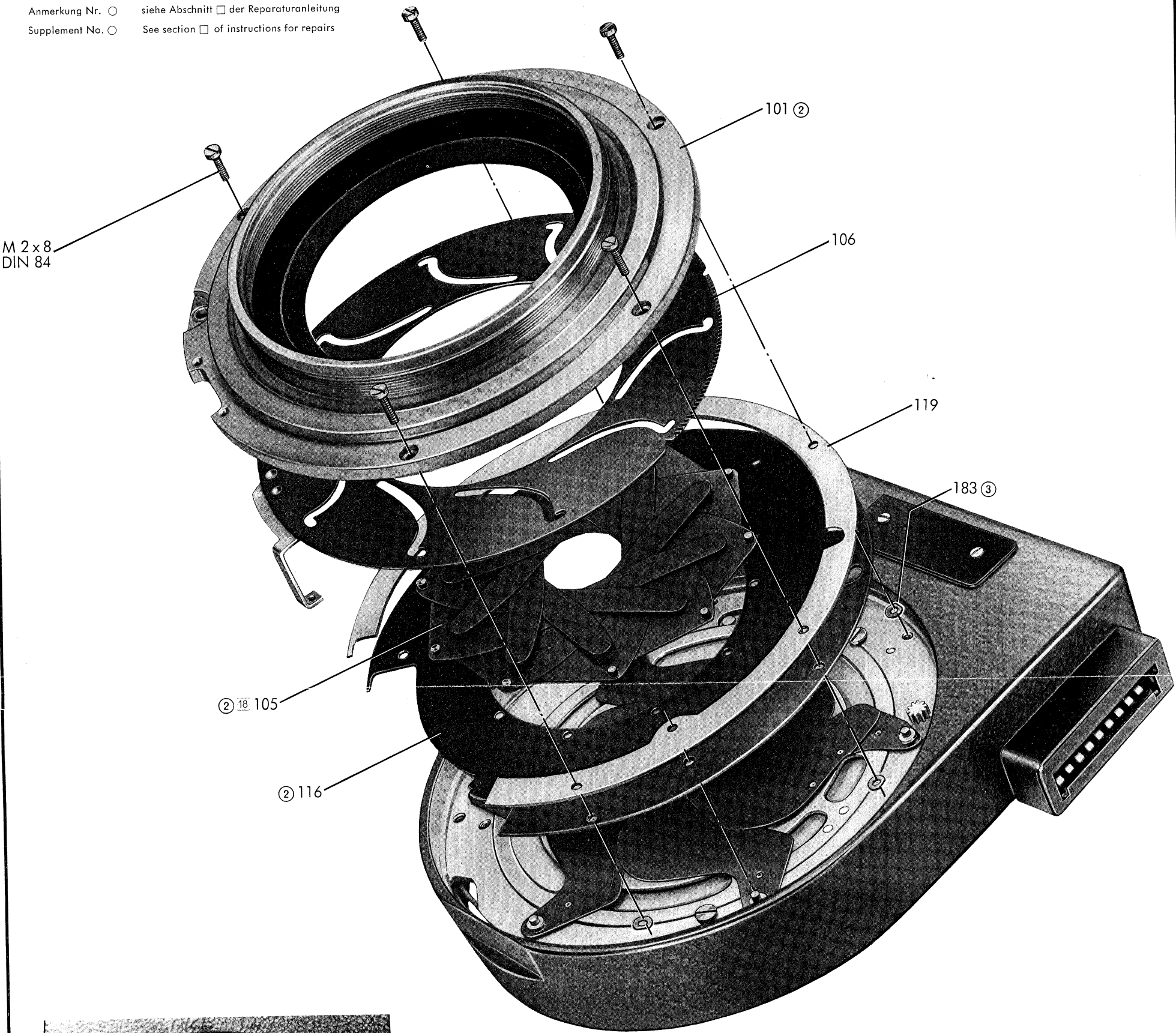


COMPUR-WERK MÜNCHEN

COMPUR electronic 5 FS
Blendensystem / Diaphragm system

CN-1732-000
Tafel / Plate 7

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
Supplement No. ○ See section □ of instructions for repairs

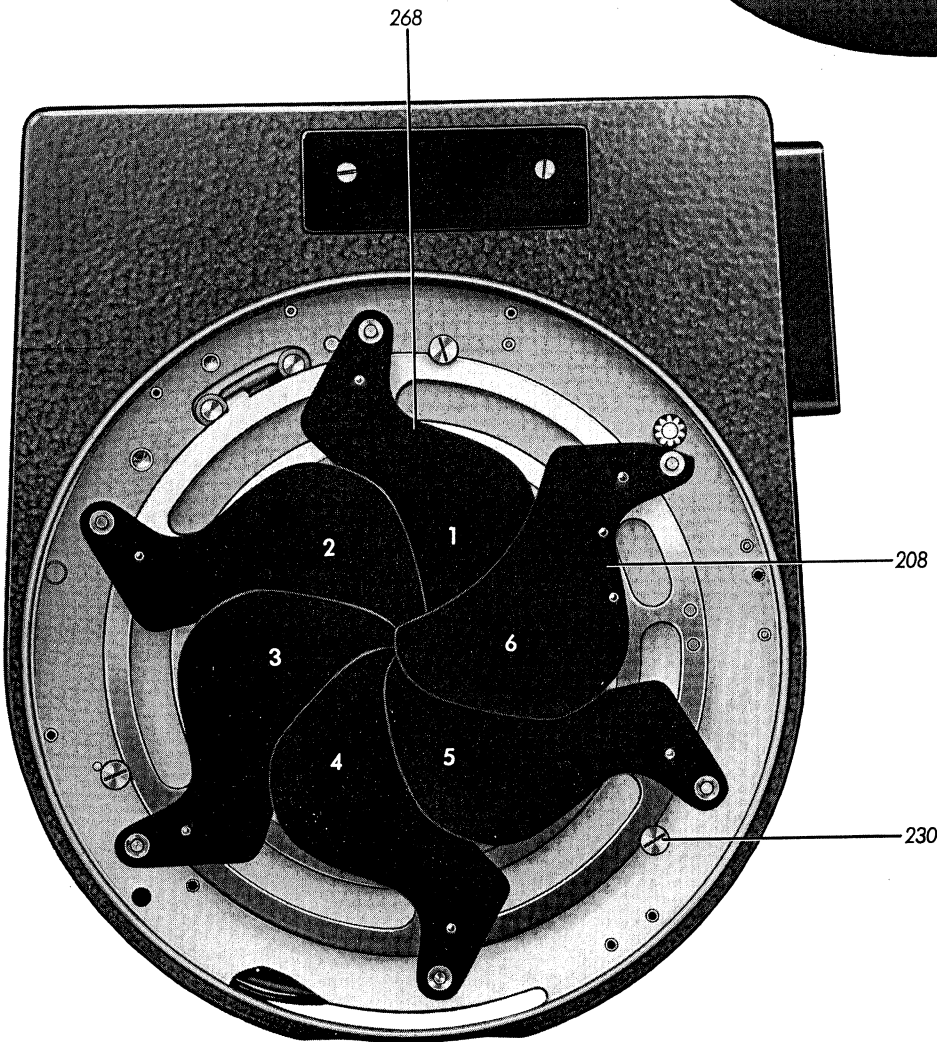
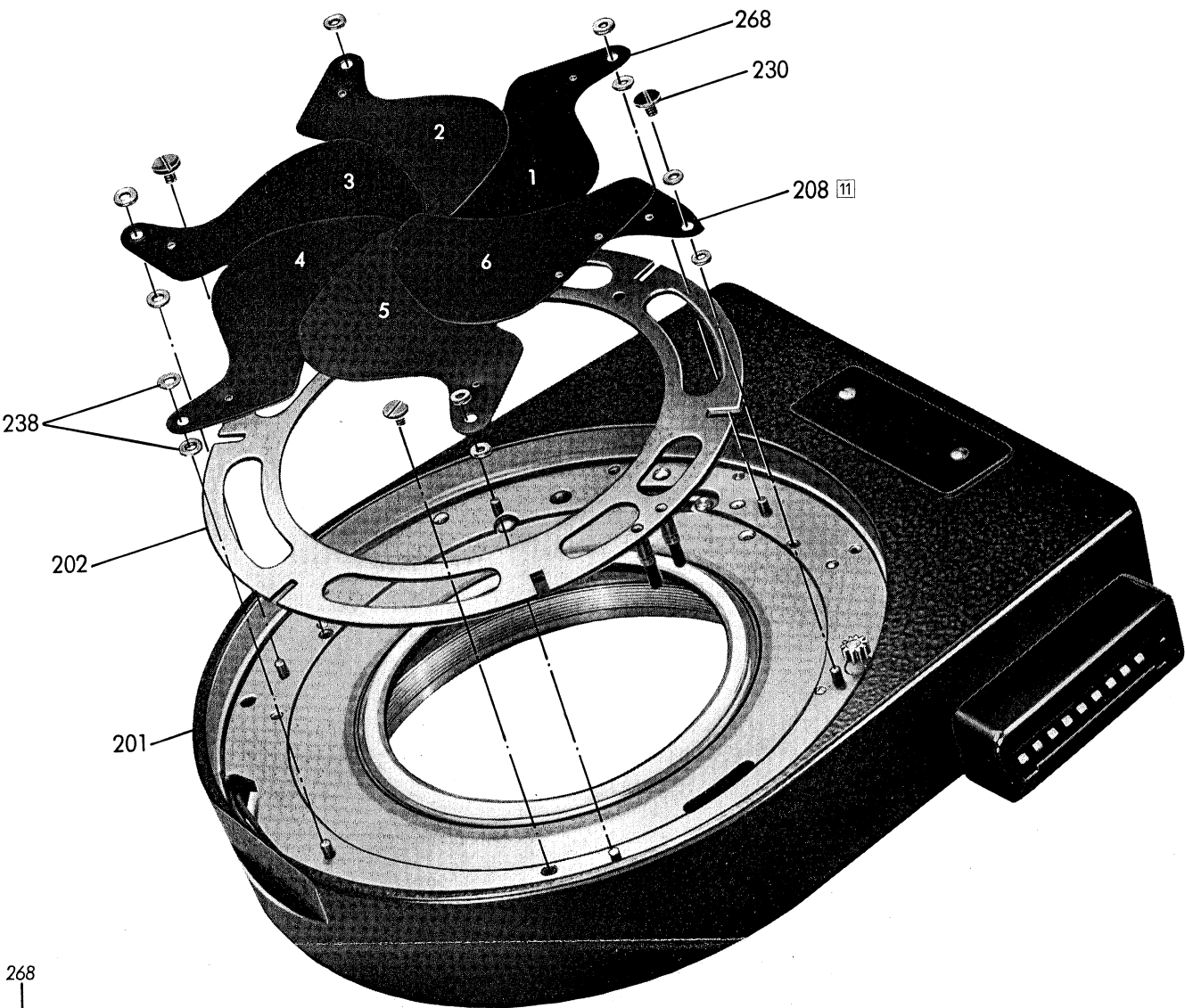


COMPUR-WERK MÜNCHEN

COMPUR electronic 5 FS
Sektorensystem / Blade system

CN-1732-000
Tafel / Plate 8

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
Supplement No. ○ See section □ of instructions for repairs

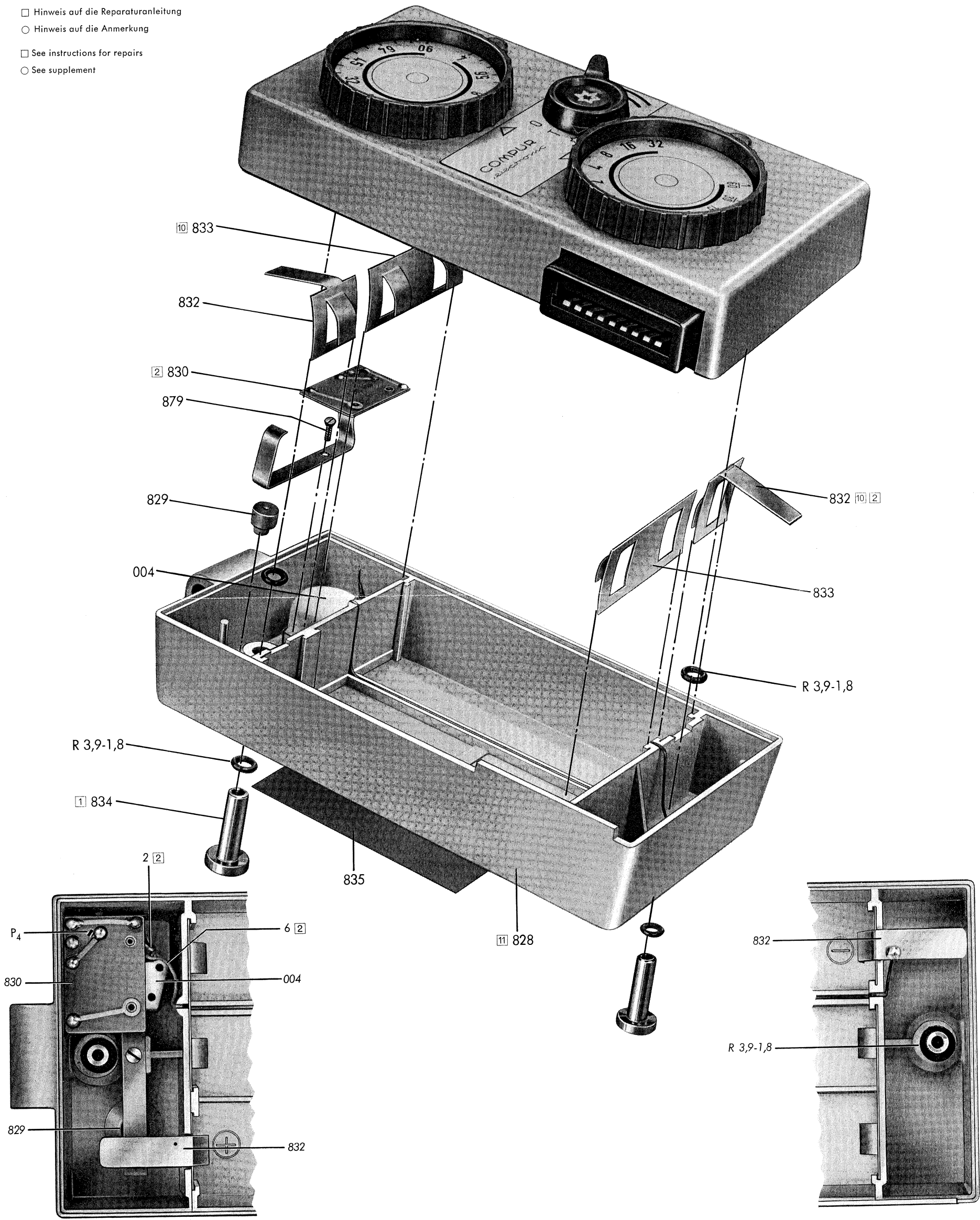


COMPUR-WERK MÜNCHEN

Fernsteuergerät zu COMPUR electronic 5 FS
Remote control unit COMPUR electronic 5 FS

CN-1032-801
Tafel / Plate 1

- Hinweis auf die Reparaturanleitung
- Hinweis auf die Anmerkung
- See instructions for repairs
- See supplement

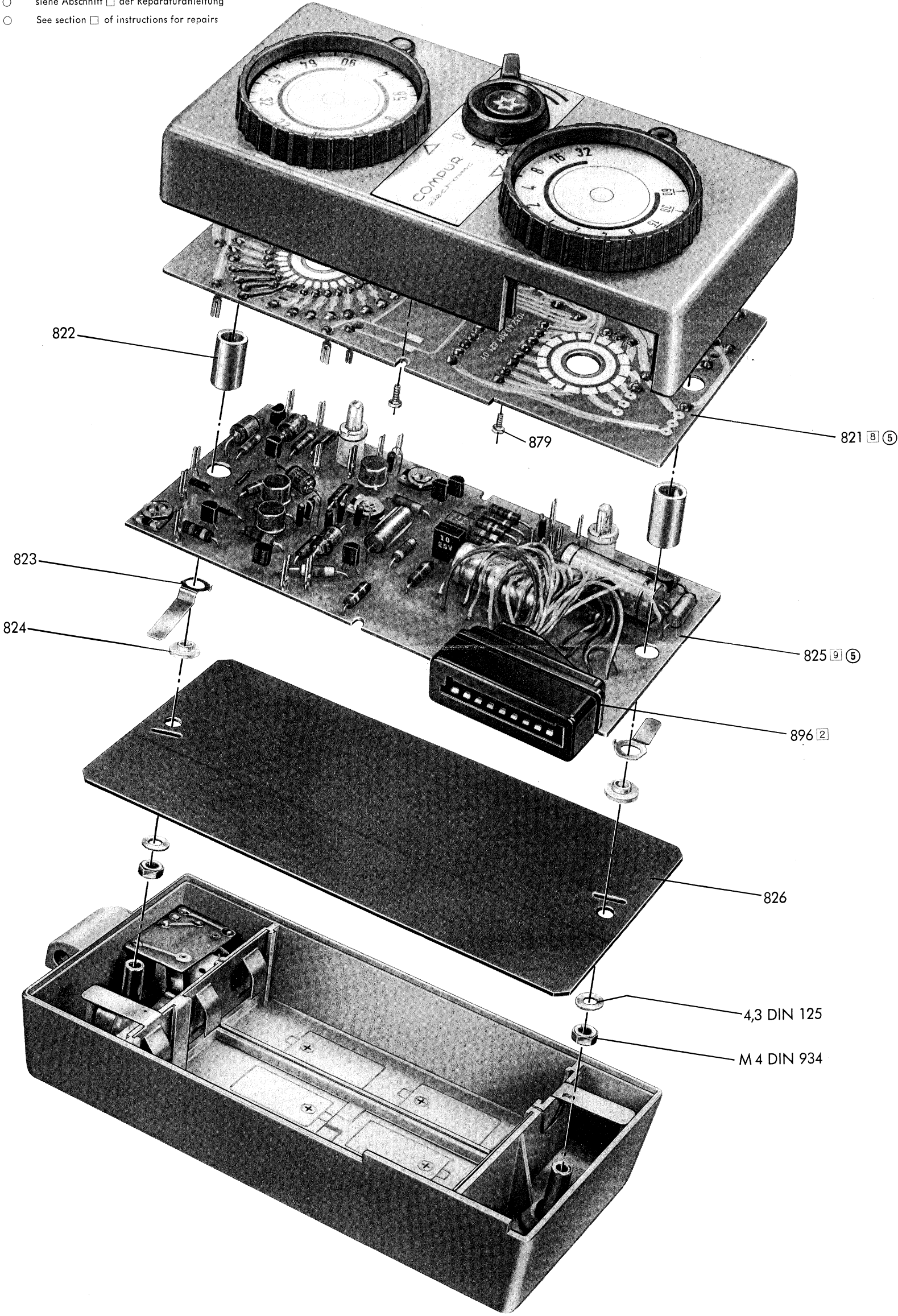


COMPUR-WERK MÜNCHEN

Fernsteuergerät zu COMPUR electronic 5 FS
Remote control unit COMPUR electronic 5 FS

CN-1032-801
Tafel / Plate 2

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
 Supplement No. ○ See section □ of instructions for repairs



COMPUR-WERK MÜNCHEN

Fig. 1 [2] [7] [8]

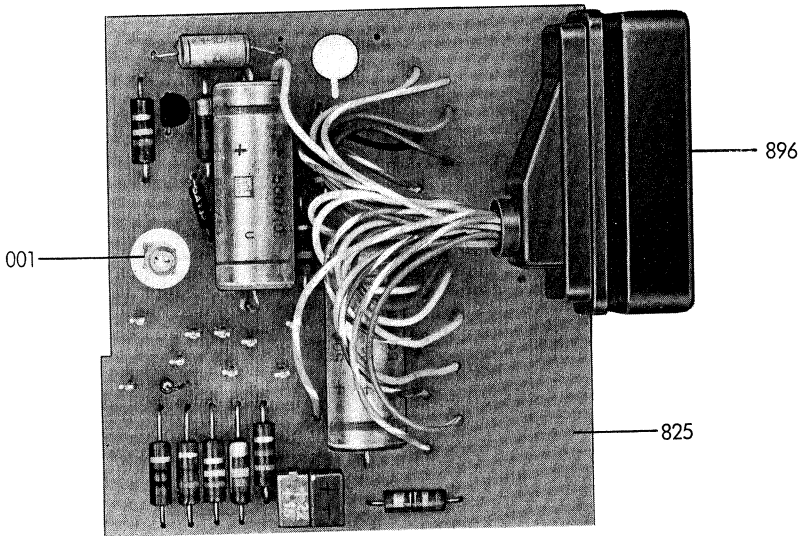


Fig. 2 [2] [19]

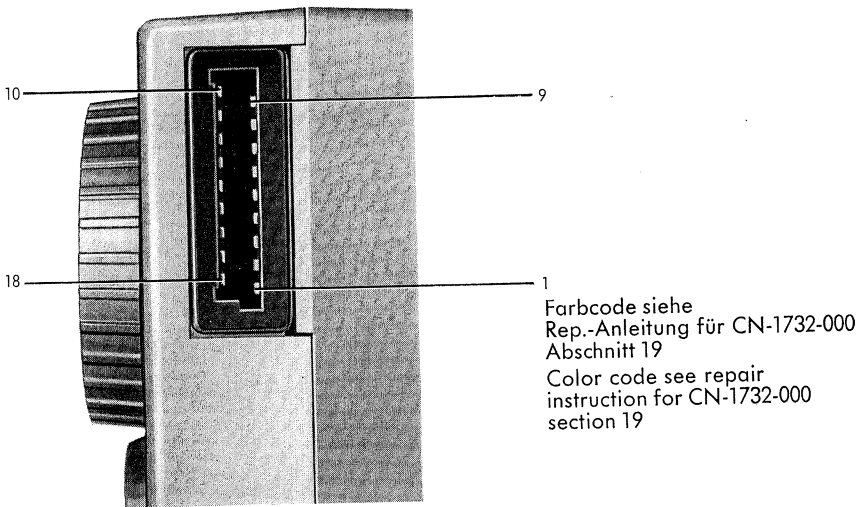


Fig. 3 [9] Zeitjustierung
Speed adjustment

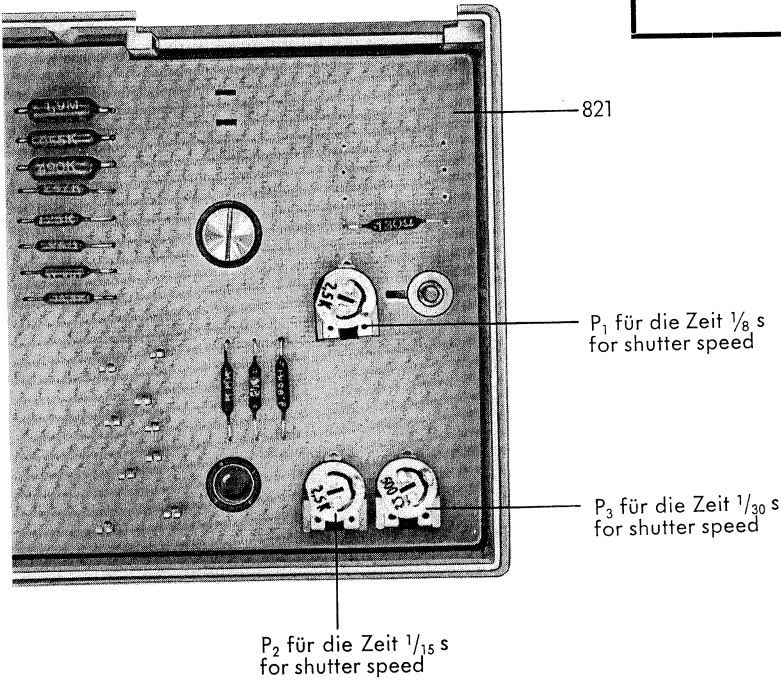
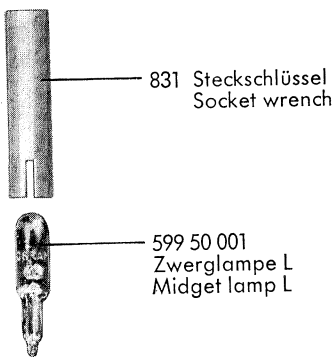


Fig. 4 [8]

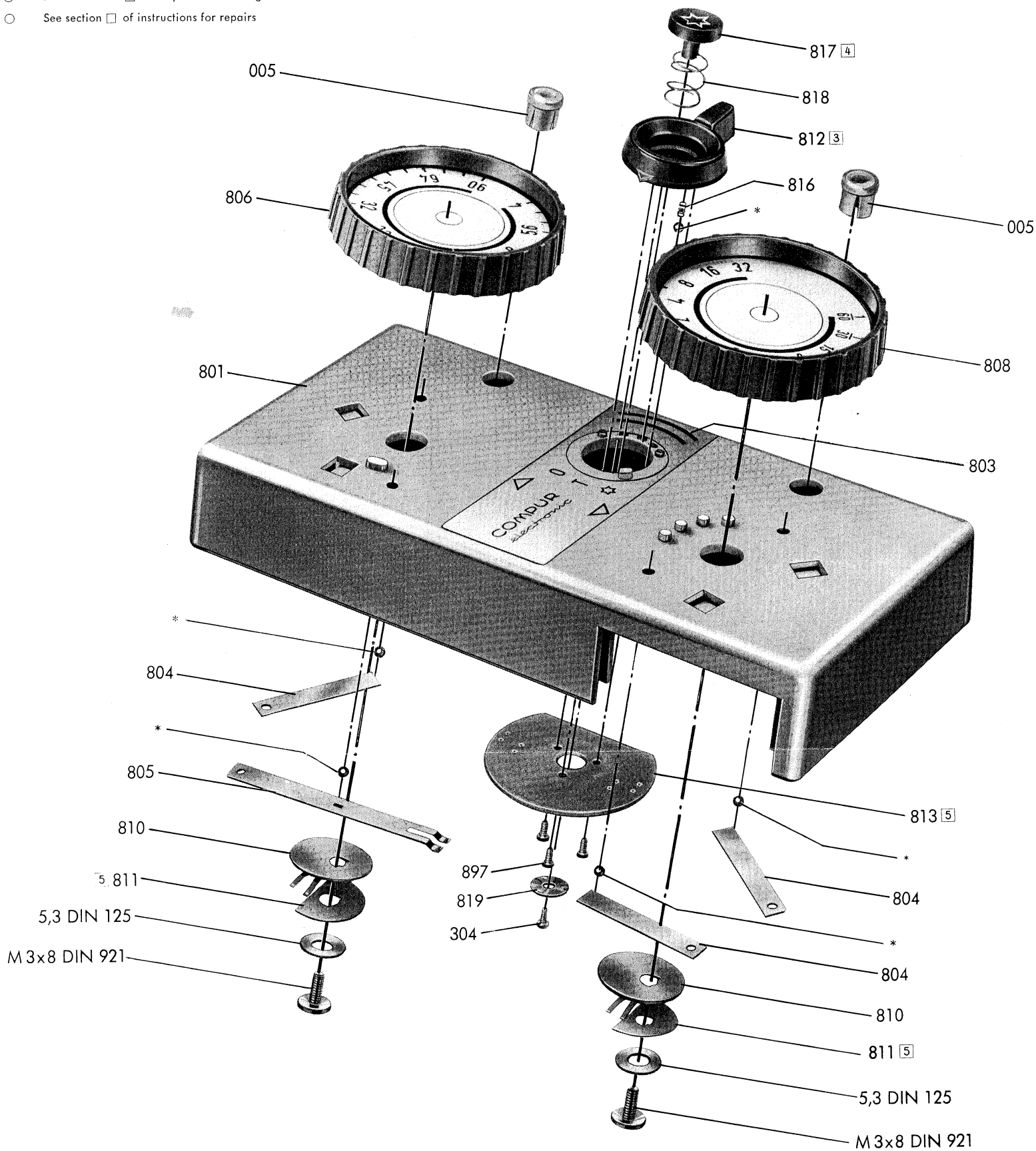


CN-1032-801
Tafel / Plate 2

Fernsteuergerät zu COMPUR electronic 5 FS
Remote control unit COMPUR electronic 5 FS

CN-1032-801
Tafel/Plate 3

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
 Supplement No. ○ See section □ of instructions for repairs



* 3 Kl. III DIN 5401

COMPUR-WERK MÜNCHEN

PARTS LIST **Supplement**

electronic
Sheet 1

- ① Use screw-on rings and spacer rings according to the following list:

A
Mounting on lens panel
without spacer ring

B
Mounting on lens panel
with spacer ring

C
Mounting on wooden
lens panel

Type of mounting	Screw-on ring			Spacer ring		Lens panel, admissible thickness d (mm)	
	Dimensions			Dimensions			
	Cat. No.	L	D	Cat. No.	H		
A	1732 30 000 102 81	1.2 ± 0.1	99.3 - 0.2	without spacer ring	—	1.5 to 6.5	
B	1732 30 604 102 81	13 ± 0.1	99.3 - 0.2	1732 30 000 135/12	12 ± 0.1	1.5 to 6	
B	1732 30 604 102 81	13 ± 0.1	99.3 - 0.2	1732 30 000 135/16	16 ± 0.1	2 ± 0.2	
C	1732 30 605 102 80	3.5 ± 0.1	110 - 0.6	without spacer ring	—	4 to 8.5	

- ② These parts are available in two different versions. Depending on the type of base plate used (part 1732 10 000 201), the following parts must be used **together**:

- I. If in the base plate the 125 mm dia. opening for the housing flange is 6.25 mm deep, use:

Characteristic

1732 30 000 101 83	Housing flange	small step with 123 mm dia. in the plane surface
1732 10 000 105 81	Diaphragm blade	length of rivets = 1.05 and 1.20
1732 30 000 116 81	Blade cover	Outside diameter 125 mm with recess of 121.8 mm dia.

- II. If in the base plate the 125 mm dia. opening for the housing flange is 5.85 mm deep, use:

Characteristic

1732 30 000 101 85	Housing flange	small step of 123 mm dia., plane surface smooth between 125 mm dia. and 112 mm dia.
1732 10 000 105 82	Diaphragm blade	length of rivets 1.2 and 1.6 mm
1732 30 000 116 83	Blade cover	outside diameter 123 mm, without recess

- ③ The shims 1732 30 000 183 80 must be used only for shutters which were originally equipped with them.

- ④ This part is available with different resistance values:

1732 10 000 881 for lenses with a diameter between **12.12 and 36.75 mm at f/16**
= for shutter model 1732 000 **without** an additional number

PARTS LIST
Supplement

1732 10 010 881 for lenses with a diameter between **8.58 and 26.0 mm at f/16**
= for shutter model 1732 010 with characteristic number 010

1732 10 011 881 for lenses with a diameter between **13.92 and 42.20 mm at f/16**
= for shutter model 1732 011 with characteristic number 011.

⑤ The electronic unit 1032 10 801 825 consists of:

Upper printed wiring board 1032 20 801 821 80

Lower printed wiring board 1032 20 801 825 80

18-pole socket 1032 20 801 896 80

Note paragraph 7 repair instruction CN 1032-801 (page 11)

PARTS LIST**Supplement****- electronic -
Sheet 2**

- ⑥ When replacing one of the parts 344, 370, 378 or 387, note the following:

Two different versions of this assembly exist, which can be distinguished by the magnet 378, the pole faces of which may either make **a right angle or an oblique angle** with its longitudinal axis. (The version with oblique pole faces is shown on plate CS-1131-362, page 3.) Magnets with 90° pole faces are no longer made. If a component of such an earlier assembly should become defective, it will be necessary to exchange the **entire** assembly.

The following parts should be used:

Spring for escapement slide	1131 30 054 344 83
Armature lever	1131 10 054 370 81
Magnet	1131 10 054 378 82
Disconnecting strip	1131 10 055 387 81

For installation of these parts the base plate 201 must be provided with two recesses (marked by arrows in plate 3 of CS-1131-362, Fig. 2). If these recesses are not provided, the base plate must be exchanged as well.

Cat. No.: 1131 10 055 201 **82**

If the magnet in the assembly already has oblique pole faces, **only the defective component** need be replaced.

- ⑦ There are two different versions of the aperture selector 590.

Version 1 has the notches for the click-stop diaphragm about 1 mm deeper than the plane surface, version 2 at the same level as the plane surface on the same radius.

Only version 2 is available as a spare part. It may therefore be necessary to file off the projecting part of the ball bushing driven into the bayonet retaining ring.

- ⑧ If the bayonet retaining ring 730 has to be replaced, the aperture selector 590 must be replaced as well, provided that the bushing of the original retaining ring projects approx. 1 mm to guide the ball of the click-stop diaphragm.

The following parts should be used:

Aperture selector	1131 30 362 590 86
Bayonet retaining ring	1131 30 055 730 82

- ⑨ There are three different versions of the backlash-compensating system of the aperture setting ring:
Version 1: With adjusting screw 1131 30 055 740 80 and headless screw 1131 30 055 744 80 (M 1.7 left-hand thread).

These parts are mounted on

Base plate 1131 10 055 201 04 (with M 1.7 left-hand thread)

Bayonet retaining ring 1131 10 055 730 81 (with M 1.7 thread for adjusting screw
1131 30 055 740 80)

Version 2: With thrust bolt 1131 30 055 740 **81** and headless screw 1131 30 055 744 **81** (M 1.7 left-hand thread) and compression spring 1131 30 055 756 **80**.

These parts are mounted on

Base plate 1131 10 055 201 05 (with M 1.7 left-hand thread)

Bayonet retaining ring 1131 10 055 730 82 (with 1.6 dia. H8 bore for thrust bolt
1131 30 055 740 81)

Version 3: Same as 2, but with headless screw 1131 30 055 744 **82** (M 1.7 right-hand thread) and base plate 1131 10 055 201 **86** (M 1.7 right-hand thread).

The new versions 2 and 3 ensure better, smoother operation of the aperture selector. It is therefore advisable to modify this assembly should repair become necessary.

When repairing shutters with a compression spring 1131 30 055 756 80, make sure whether the headless screw 1131 30 055 744 in the shutter has a left-hand thread (index 81) or a right-hand thread (index 82).

When repairing shutters with an adjusting screw 1131 30 055 740 80, it is advisable to exchange the parts

1131 30 055 740 80 adjusting screw

1131 30 055 744 80 headless screw

for

1131 30 055 740 **81** thrust bolt

and 1131 30 055 744 **81** headless screw (with left-hand thread) or **82**
(with right-hand thread.)

In addition, install

1131 30 055 756 **80** compression spring.

In order to be able to install the aforementioned parts, the following preparations are required:

Base plate 1131 10 055 201 —

With M 1.7 left-hand thread, bore 1.8 mm hole for headless pin 744 to a depth of $4.5 + 0.3$.

Bayonet retaining ring 1131 10 055 730 —

Bore core hole with M 1.7 thread for adjusting screw 1131 30 055 740 80 to 1.6 mm dia. H8 as a guide for the thrust bolt 1131 30 055 740 81.

- ⑩ The slide 138 exists in two different versions, which can be distinguished by the slide's operating position in relation to the detent lever 242.

Version 1: Contact with the detent lever is made directly with the pointed end of the slide.

Version 2: The connection between the slide 138 and the detent lever is made by the trip pin 136 and the screw 137.

The "spring for detent lever" 245 is available in two different versions, distinguished by the different length of one of the legs.

For version 1 use:

Slide

1131 30 055 138 80

Spring for detent lever

1131 30 055 245 80

For version 2 use:

Screw for trip pin

1131 30 055 136 80

Trip pin for slide

1131 30 055 137 80

Slide

1131 30 055 138 81

Spring for detent lever

1131 30 055 245 82

COMPUR-electronic**Instructions for Repairs****Page 1****COMPUR-electronic 3****Cleaning of shutter**

It is imperative to remove parts from the shutter for cleaning, which should be done by rinsing them in clean, grease-free trichloroethylene or perchloroethylene. Parts enameled green or black, the front plate with filled engravings, plastic parts, the printed wiring segment and the magnet should never be wetcleaned. Use a soft chamois leather or brush.

Before reinstalling parts in the shutter, be sure they are completely dry and regreased in accordance with the lubricating instructions.

Lubricating instructions

The necessary lubricants can be ordered from us. Other lubricants should not be used, as only those tested in our factory will ensure proper functioning of shutters.

Apply a thin film of the prescribed lubricant to a glass plate and use a fine brush or foam rubber swab to apply the lubricant at the required point. In addition, the lubricant must be stirred briskly before use.

The lubricating chart 1531-000 indicates both the points to be serviced and the required lubricants.

Assembly and adjustmentCN-1531-000
page

The **speed selector ring 539** must engage perfectly in the notches corresponding to the different speeds. If necessary, adjust the lock spring **595** accordingly.

1

Wiper 536 (on speed selector ring): Both spring lugs should rest on the tracks of the printed wiring segment **382** with sufficient pressure to ensure perfect contact. Check with the speed selector ring removed: (Fig. 3).

1

6

3

The spring tension of each lug at a distance of 1.2 mm from the underside of the selector ring must be 25 ... 40 g.

The gold plating at the contact points of the lugs should not be damaged or worn (contact resistance!).

The **blades 208, 267 and 268** and their bearings must be completely free from grease. The sequence of installation is marked in the illustrations (Fig. 2) with the figures 1 to 5, beginning with the pin of the blade-opening ring **252**. The tips of the blades **267 and 268** are slightly bent upwards to facilitate sliding of the blades on each other.

10

11

The **blade-opening ring 252** is centered by the spacer ring **176**. It should be easy to rotate.

10

The **spacer ring 176** and the **blade cover 116** are fixed by two pins in the base plate **201** (Fig. 1).

10

11

CN-1531-000
page

The **blade ring 202** is supported by a plastic ring and therefore does not require lubrication.

When mounting the blade ring on the base plate, take care to ensure that the closing spring **249** of the blade ring is in the correct position (Fig. 3).

6

There are two models:

- a) The end of the closing spring **249** is retained in the base plate when the blade ring is taken out so that it remains visible in the recess of the base plate.
- b) Older model: The leg of the spring is not retained. In this case, the printed wiring segment **382** and the X contact lever **615** must be removed to permit the blade ring closing spring **249** to be hooked in behind the lug of the blade ring.

The X-contact is closed and opened automatically by the X-contact lever **615** (Fig. 3).

7

Contact clearance: min. 0.5 mm.

Contact pressure: min. 35 g.

The X-contact closes when the tips of the blades lie between an aperture diameter of 34.0 to 39.0 mm.

Any deviation from these values should be corrected by bending the contact spring **606**.

6

The **diaphragm blades 105** and their bearings should be completely free from grease. Insert the blades in such a manner that the inner one is tangent to the full opening of 40 mm diameter (Fig. 1).

9

The **shim 119** is fixed relative to the base plate by two pins.

The recess (on top) serves as bearing of the diaphragm cover **106**.

Attach the **diaphragm cover 106** so that the pin comes to lie at a point which is displaced clockwise by about 30° from the diaphragm locking spring **114**. During this operation the diaphragm pins should be located at the beginning of the radial portion of the guide slots (Fig. 2).

8

9

Secure the **cover ring 142** by means of the screws **117** which must be flush.

8

The **housing flange 102** and the base plate **201** are fixed relative to each other by two holes and two guide pins.

8

The **diaphragm ring 108** is secured by the screws **120**. Tighten these screws without locking the diaphragm ring. The contact point between screw head and diaphragm ring should be moderately greased with lubricant A.

COMPUR-electronic

Instructions for Repairs

Page 3

CN-1531-000
page

The diaphragm click stops must be clearly noticeable. If necessary, bend the lock spring **114**. Unscrew the correction slide **110** only if absolutely necessary and after having marked the position of the slide relative to the diaphragm ring.

Correction of diaphragm aperture: If a part of the diaphragm assembly (diaphragm cover **106**, diaphragm blade **105**, blade cover **116** or diaphragm ring **108**) has to be replaced, measure the diameter of the diaphragm aperture before disassembly, if possible in wide-open position. This value should be checked after reassembly and, if necessary, corrected by means of the slide **110**.

8

The **tensioning lever 830** and the **tensioning pinion 517** should engage in the position shown in Fig. 2.

2 3

Drive 514, escapement lever 341, anchor lever 370 or anchor 372:

If one of these parts is exchanged, check whether the anchor is able to move on the shaft and whether the entire surface of the anchor is in contact with the magnet **378** when the shutter is tensioned. If necessary, replace the anchor.

In this position there must be a gap between the escapement lever **341** and the anchor lever **370** (Fig. 4) allowing free motion of the anchor lever spring **375**. If in an exceptional case this condition should not be satisfied, file off the anchor lever **370** at the point of contact.

3

Width of gap: 0.05 mm to 0.15 mm.

The **anchor lever spring 375** presses the anchor against the magnet via the anchor lever. The spring tension should be 15 g to 25 g (Fig. 5).

2
3

The **escapement lever spring 375** must pull the escapement lever **341** back quickly enough from its intercepting position. The torque should be between 200 cmg and 250 cmg (Fig. 4).

3

The **magnet 378** should positively intercept the drive in "open-time position" via the anchor and escapement levers and retain it until the solenoid current is interrupted. Holding force on anchor with energized magnet: $P = \text{min. } 400 \text{ g}$ (Fig. 5).

3

A battery voltage of 4.5 to 5.6 volts is required for this purpose.

If the magnet remains de-energized, unsolder it from the printed wiring segment **382** and check it separately, in conjunction with the battery.

If the magnet remains de-energized even then, it should be replaced. If the magnet works satisfactorily, the trouble must be assumed to be in the printed wiring segment and particularly the control switch. (See also the section on the power source).

Printed wiring segment 382: When attaching this segment take care to ensure that the two forks engage the corresponding pins. Secure the segment with the aid of the bolts **304** and **350** and the nut **389**. Spare segments are only supplied complete. The control switch on the segment is of decisive importance for the correct and reliable operation of the electronic escapement. The position of contacts **385** and **397** as well as the initial tension of the spring lug **386** factory-adjusted and should not be changed.

6

CN-1531-000
page

For checking purposes:

Contact pressure between spring lug 386 and contact 397 = 25 - 40 g.

Distance between spring lug 386 and contact 385 = 0.15 - 0.25 mm.

Adjustment of the control switch in the shutter:

Bend the spring lug 386 at the point indicated in Fig. 2 so that with the tensioning ring in resting position the contact pressure at the contact 385 is 10 g to 30 g.

Speed setting:

$\frac{1}{200}$ sec: The blade ring travels freely and without being intercepted by the escapement. The speed is thus determined exclusively by the drive spring 515.

2

All other speeds are given by the electronic circuitry of the printed wiring segment.

Trimming at the potentiometer P2 increases or reduces the speeds of the entire speed range (Fig. 1).

7

The setting of the potentiometer P1 must not be changed.

Shutter speeds (effective speeds): The following limit values represent narrower tolerances than would be allowed according to DIN or ASA.

Value engraved on selector ring									
Upper limit									
Effective speed									
Lower limit									
Value engraved on selector ring	2	4	8	15	30	60	125	200	ms
Upper limit	550	275	137.5	68.75	34.43	17.19	8.59	5.50	ms
Effective speed	500	250	125	62.5	31.3	15.63	7.81	5.00	ms
Lower limit	454.6	227.3	113.6	56.82	28.45	14.21	7.10	4.55	ms

Maximum accuracy of the electronic escapement is achieved with constant battery voltage (5.6 volts). A drop in battery voltage will change the shutter speeds only slightly within the tolerances allowed by DIN and ASA.

Power source:

If possible, the Mallory PX-4 mercury battery (5.6 volts) should be used, for which the manufacturer claims a shelf life of over one year. If the power output of the battery drops below the required minimum, the magnet cannot hold the blade system in "open position", and the blades close immediately.

If the above mentioned battery is not available, the tubular batteries listed in the following table can be used instead. All of these batteries fit into the battery case.

Mallory	Philo	Ever- eady	Matsu- shita	RCA	Japan	Burges	PERTRIX (PEROVX)	Rag-O- Vag
PX-4								
PX-2		No. 523/ 531						
PX-21							No. 247 3 ea.	
TR-133 (TM)		E 133		VS 149		H 133		1304 M
TR-164 (TM)		E 164		VS 164		H 164		—
TR-133 (TM)	P 133		KM-3 A		003 P			
TR-164 (TM)	—		KM-4 N		004 P			

In general, all power sources having a voltage of between 4.0 and 6.0 volts and delivering 50 mA under load can be used (4.5-v. flat battery, 6.0-v. lead storage battery).

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page

Release 508: When the release is operated with the selector ring set at any desired speed, the following functions must be performed:

4

a) Blades closed:

The tripping member must operate the locking lever **510** reliably and should not rub on the latch **584** (Fig. 3).

2

5

b) Blades open:

When first operated, the tripping member must operate the latch **584** (the opening lever 262 is returned by the spring 264, the blades close). The tripping member should not rub on the latch. When operated a second time, the functions described under 'a' must be performed.

c) **Pre-contact** (on printed wiring segment 322)

contact pressure: $p = \text{min. } 20 \text{ g}$

contact position: $a = \text{min. } 0.2 \text{ mm}$

If in rest position of the release the contact clearance is less than 0.2 mm, the contact must be readjusted.

For i n c r e a s i n g the contact clearance proceed as follows:

1. If the contact pressure is considerably greater than 20 g, cautiously bend the contact stop 367 upwards. This will reduce the contact pressure.
2. If this adjustment is insufficient or if the contact pressure is already 20 g, slightly bend the offset end of the contact spring 366 upwards. This will leave the contact pressure unchanged.

Note: Use e x t r e m e c a u t i o n when bending the contact stop 367! The stop cannot be bent back.

If the contact pressure is too low, replace the springs.

At the end of its operating cycle the release must be returned to its rest position by the spring.

Adjustment:

By adjusting the eccentric (adjusting point 1; Fig. 3) and, if necessary, bending the tripping member (adjusting point 2; Fig. 3). Check the T-function after this adjustment. When the release is first operated, the opening lever 262 is rotated (Fig. 4) by the fork formed by tripping member and thrust lever, and the blades are opened. When operated a second time, the functions described under 'b' are performed.

5

5

The **detent lever 242** should lock the blade ring in its resting position immediately after the shutter has operated.

Restoring force on detent lever: (in intercepting position) $P = 15 \text{ g } 25 \text{ g}$ (Fig. 2).

5

Concentricity and planar trueness test:

Concentricity: Maximum eccentricity between front and rear lens centering flanges: 0.02 mm.

Planar trueness: Maximum wobble between front lens flange and rear lens flange: 0.02 mm.

COMPUR-Diaphragm Setting Unit for „electronic-3“ shutter

Cleaning

Parts should exclusively be dry-cleaned by means of a soft brush.

Lubricating instructions

Grease lightly with type A lubricant: teeth of the gears, diaphragm ring 108 - idler 853 and idler bearing.

Assembly and adjustment

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page

Insert the **carrier plate 851** into the guide grooves of the carrier **850** and lock it with the two pins. 1

Introduce the **pre-selection stop spring 860** laterally into the pre-selection stop **864** (Fig. 3). 2

Limit the excursion of the **selector slide 858** by means of the stop screw **862**. 1

Instructions for installation on the shutter:

1. Check whether the diaphragm range of the shutter (aperture scale 1531 30 000 541; see page 2 1531-000) agrees with that of the diaphragm setting unit (scale **858**). 1
2. Set the diaphragm at the smallest aperture (e. g. 32) both on the shutter and the selector slide of the setting unit. 2
3. Insert the bearing shaft of the idler into the corresponding hole in the shutter housing. If necessary, make the pinion engage the diaphragm ring by slightly pulling out the selector slide.
4. Secure the setting unit by means of the two screws 1531 30 801 **861**. 2
5. Set the aperture selector of the shutter at any medium f-stop value.
6. Set the pre-selection stop **864** at the same value.
7. Loosen the pointer screw **856** and move the pointer **855** upwards until its contact edge touches the pre-selection stop; during this operation press the selector slide **858** down lightly to compensate for tooth clearance. Retighten the screws. 1
8. When mounting the shutter with attached diaphragm setting unit on the lens panel use the spacer ring 1531 30 000 **135**. 2

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Cleaning of shutter

For cleaning parts, remove them from the shutter and rinse them in clean, grease-free trichloroethylene or perchloroethylene. Plastic parts, printed wiring boards, coils and parts enameled green or black should never be wet-cleaned. Instead, a soft chamois leather or brush should be used.

Lubricating instructions

The necessary lubricants can be ordered from us. Other lubricants should not be used, as only those tested in our factory will ensure proper functioning of shutters.

Before use, stir the lubricant thoroughly.

The lubricating chart CN-1732-000 indicates both the points to be serviced and the required lubricants (A and B).

CN-1732-000
plate

Assembly and adjustment

1. **Soldering:** The soldering iron (we recommend an electric soldering iron of 30 watts) must be properly heated. The joint should be heated only briefly or the laminated copper contact bank may come off the plastic base. The soldering flux must be acid-free and non-resinous. A 60% tin alloy should be used as solder. Wire solder with integral flux (e.g. "FLUITIN", 1 mm dia.) is very appropriate.
2. **Tripping magnet 508 and escape magnet 378:** The magnet must withdraw the armature positively from the notch of the locking lever **510** or the escapement lever **341** and release it. For this purpose, the magnet must be screwed down so that on the one hand the stroke of the armature (air gap) does not exceed 0.8 mm (Figs. 1 and 5), while on the other there must be a gap of at least 0.05 mm (Fig. 3) between the point of the ratchet tooth of the armature and the locking lever **510** or the escapement lever **341** with the armature in pulled-up position. Firmly tighten screw **380**.

3 a 2

Checking the magnet: With a force of 250 g applied to the armature, the magnet must safely attract the armature at a voltage of 9.0 v and with an air gap of 0.6 mm.
 With this air gap, the armature spring **375** should swing out the armature with a force of 20 . . . 30 g (as measured at the spring rivet).
 The points for connection to the corresponding printed wiring board (887, 885) are evident from Fig. 1.

3
3
1 a 3
3. The **escapement lever 341** must be so adjusted with the eccentric bush **288** (Fig. 1) that with dropped-out armature there is a gap of 0.01 . . . 0.05 mm between the flank of the ratchet tooth and the notch (Fig. 1). The torque at the escapement lever must not be less than 50 cmg. If necessary, hook the escapement lever spring **344** into a different hole.

2
4. The **tensioning detent 868** and the **tensioning pinion 517** must be engaged in the position shown in Fig. 3 (see also Section 5, tensioning gear 500).
 The detent spring **874** must swing the detent safely back to the stop and at the same time actuate the contact 1 (Fig. 3/see Section 7).

2
5. **Tensioning gear 500; drive 514 and locking lever 510:** If these parts are replaced, check the engagement of the locking lever. When the detent is moved to its outermost position by the cam disk **862** of the gear mechanism, the gap between the locking face of the locking lever and that of the drive must be 0.05 mm at least (Fig. 3). If this is not the case, a larger tensioning roller 871 must be used on the detent. Tensioning rollers of 3.0 and 3.6 mm diameter are available.
 The spring **513** must definitely move the locking lever into locking position.

4, 2+3
6. The tension of the **thrust pawl spring 533** must be strong enough for the thrust pawl to be pressed against the lug of the blade ring **202** (Fig. 1) in any phase of the drive's **514** motion.

3

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plate

7. **Switch st** (on plug side; on printed wiring board 886) Fig. 2. This switch should be adjusted with particular care, since it controls the speed circuit.
The switch must open directly after the blade ring starts moving; at that instant the blades must still be closed.
At $\frac{1}{15}$ sec, the delay from the opening of the contact and the exposure of half the open area of the shutter must be between 19 and 24 ms.
Contact clearance $a \approx 0.3$ mm
Contact pressure of closing contact: $P = \text{min. } 50$ g
(see also Section 10 and Instructions for Repairs on remote control unit, Section 8). 3

8. **Switch A** on printed wiring board 887 (on drive side) and **switch M** (on motor side) on printed wiring board 835. 2
These two switches are connected in parallel.
At the beginning of tensioning, switch M must first close the contact 2 after release by the detent (Fig. 2). Only then must switch A open (released by drive).
If necessary, bend the ends of the contact springs to achieve this.

- Switch A 2
Contact clearance = min. 0.3 mm (shutter tensioned)
Contact pressure = min. 30 g (shutter untensioned)

- Switch M 2+3
Contact clearance = 0.3 ... 0.4 mm
Contact pressure of contact 1 = min. 25 g (Fig. 2)
Contact pressure of contact 2 = min. 30 g (Fig. 2)

9. **X-contact switch** on printed wiring board 886; 3
The spring lug must be adjusted so that
the contact is closed by the spring pin of the blade ring 202; when the aperture diameter formed by the tips of the blades is 58.0 to 63.0 mm; in addition, the blade-ring pin must break the X-contact during closing (Fig. 1).
Contact pressure = min. 35 g
Contact clearance = min. 0.5 mm

10. **Closing spring for blade ring 249:** The force of this spring must be great enough to keep the blade ring closed when the shutter is tensioned, against the force of the X-contact spring and the switch St.

11. The **blades 208 and 268** as well as their bearings must be perfectly free from grease. The sequence of insertion is marked by the figures 1 - 6 in the illustrations (Figs. 1 and 2). 8

12. **Motors:** The tensioning motor is marked by a blue dot and the diaphragm motor by a green dot (Fig. 2). 3
Sense of rotation: Tensioning motor: clockwise
Diaphragm motor: clockwise if the selector switch on the control unit is moved from T to O.
The red wires are then in contact with the tracks 4 and 5 (Fig. 2).
If the motor support 850 was removed, the tooth clearance between the motor pinion and the connecting gear 852 must be readjusted (adjust for smooth operation and minimum clearance). For this purpose adjust the eccentric (Fig. 2) as required, with the screws only slightly tightened. 4+5
4+5

13. **Aperture control pinion 875:** clamp the bearing bushing with the retaining lug 265. 5

14. **Wiper 883** on diaphragm cover 106. The contact pressure of the two spring lugs should not be less than 25 g. For the adjustment, remove the wiper. One of the spring lugs must rest on the middle of the potentiometer 881, while the other one must coincide perfectly with the track (printed wiring board 880) (Fig. 1). 6

15. **Diaphragm gear 800:** The coupling gear 866 is spring-loaded on the coupling gear shaft 865 (with friction disk) by means of the spring 867 (Fig. 1). The torque must be 5

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plate

chosen so that on the one hand the diaphragm is positively moved in both directions, while on the other the slipping clutch becomes effective the instant the diaphragm reaches a stop.

16. Correction of diaphragm aperture

If a part of the diaphragm assembly has to be replaced, it is advisable previously to mark the position of the potentiometer **881** on the base plate and to measure the diameter of the diaphragm aperture at a certain f-stop setting (remote control unit) before loosening the screws **890** (choose the largest diaphragm aperture possible).

6

For the adjustment proceed as follows:

- a) Mount the parts as shown on plate 6 in the operational shutter.
- b) Connect the shutter to the remote control unit 1032-801 and set at 'T'.
- c) Loosen the screws **890** and shift the guiding blade **881** by turning the control pinion **892** until the diaphragm aperture has the required diameter (see table in Note 0).
- d) If the camera lens has a maximum aperture which lies between the values of the standard series (i.e. which does not coincide with f/4, 5.6, 8 or 11), the next higher value of the standard series (e.g. f/5.6 with an f/4.5 lens) must be used for adjusting the aperture diameter.

When the control pinion **892** is turned or the potentiometer shifted, the aperture diameter will not change immediately. For this purpose a starting pulse for the control process must first be given by moving the aperture selector back and forth.

When the adjustment has been completed, fix the control pinion with the aid of the DIN 546 slotted nut.

6

17. Adjust the diaphragm stop 122 after correcting the aperture diameter. To do this, set the remote control unit to the maximum aperture of the lens.

6

Then loosen the screws **612** and shift the stop **122** counterclockwise - as viewed from the shutter back - until a resistance can be felt (the stop then rests against the diaphragm cover 106).

7

Tighten the screw 612.

If the camera lens has a maximum aperture which lies between the values of the standard series (i.e. which does not coincide with a maximum aperture of f/4, 5.6, 8 or 11), adjustment of the stop must be preceded by setting the selector knob of the control unit to that click-stop position ($\frac{1}{3}$ interval) at which the aperture diameter is identical or slightly larger than the nominal diameter of the maximum aperture.

Check :

If the setting on the control unit is changed from a smaller aperture to the maximum aperture, the signal lamp must go out after a few seconds (as soon as the setting operation has been completed).

If a larger aperture is set on the control unit in excess of the maximum aperture of the lens, the aperture diameter must increase only slightly and the signal lamp must light up (warning against erroneous settings).

18. The diaphragm blade 105 and its bearings must be completely free of grease. For sequence of insertion see Fig. 1.

7

19. The socket 896 has 18 contact springs.

3

For the numbers of terminals, see Fig. 4. Part of these numbers refer to the contact tracks and solder points of the printed wiring boards. Every contact (number) corresponds to a certain wire color (Fig. 2).

Color code:	1 = brown	10 = black
	2 = red	11 = brown/white
	3 = orange	12 = red/white
	4 = yellow	13 = orange/white
	5 = green	14 = yellow/white
	6 = blue	15 = green/white
	7 = violet	16 = blue/white
	8 = gray	17 = violet/white
	9 = white	18 = gray/white

20. **Shutter speeds** (effective speeds t_e): The following limit values represent narrower tolerances than would be allowed according to DIN or ASA.

Value engraved

on selector ring	32'	16'	8'	4'	2'	1'	2	4	8	15	30	60
Upper limit	35.2	17.6	8.8	4.4	2.2	1.1 s;	550	275	137.5	68.75	34.43	17.19 ms
Nominal value	32	16	8	4	2	1 s;	500	250	125	62.5	31.3	15.63 ms
Lower limit	29.09	14.55	7.27	3.64	1.82	0.91s;	454.6	227.3	113.6	56.82	28.45	14.21 ms

Maximum accuracy of the electronic escapement is achieved with constant battery voltage (9.0 volts). A drop in battery voltage will change the shutter speeds only slightly within the tolerances allowed by DIN and ASA.

The speed setting mechanism is an **integral part** of the remote **control unit 1032-801**. (See Instructions for Repairs on the remote control unit CN-1032-801). The shutter does not contain any part which would allow setting or adjusting of the shutter speeds.

21. **Concentricity and planar trueness test**

Concentricity:

Maximum eccentricity between rear lens component and front lens component = 0.02 mm

Maximum eccentricity between shutter and rear lens component = 0.04 mm

Planar trueness:

Maximum wobble between front lens flange and rear lens flange = 0.03 mm.

Remote Control Unit for COMPUR electronic 5 FS

Cleaning:

The instrument must only be cleaned dry or with the aid of alcohol or benzene.
The three printed wiring boards and the indicator must never be wet-cleaned.

Lubrication:

Only A and C-type lubricants must be used; they will not attack the plastics used in the construction of the instrument. These lubricants can be obtained from us.

Lubricating points: Bearing of aperture selector dial 806,
bearing of speed selector dial 808,
bearing of knob 812,
click-stop ball and notches.

CN-1032-801
plate

Assembly and adjustment

1. **Open** the remote control unit by loosening the screws **834** with the aid of a coin or a screwdriver. 1
When separating the two halves of the housing always keep the control half (upper part 801 with controls) on the upper side to prevent the batteries from falling out.
2. **Soldering** } see corresponding sections of instructions
Socket 896 } for COMPUR electronic 5 FS
3. The **knob 812** must properly engage each of the three click-stop positions. For lubrication, see above. 3
4. The **release button 817** must make perfect contact when pressed and return to its original position when released. 3
5. **Terminal carrier 813** and **sliding contact 811**: The wipers must be so adjusted that they rest with a pressure of about 20 g on the contact tracks of the printed wiring board **821**. 3
6. The **aperture and speed selector dials 806 and 808** must be positively arrested in each of their click-stop positions. The locating moment of the two dials should be roughly identical; if necessary, correct the tensioning of the leaf springs 804 or 805. Watch lubrication! 3
- *) 7. **Printed wiring boards 821 and 825**: Electrical components for the printed wiring boards are not supplied by us. In the case of a defect or failure of the electronic system either replace the complete wiring board or return the remote control unit to us for repair. 2

You should not exchange electrical components and particularly no diodes or transistors, because to guarantee proper functioning of the circuit these components must have certain tolerances and because special measuring instruments are required for adjusting the circuit:

When mounting the lower wiring board 825, check for perfect fit of the forks to ensure that the bridge and wiring board are perfectly seated in the forks. The signal lamps must be properly seated in their sockets (no loose contact).
8. **Signal lamps**: These are inserted in the circuit or control loop of the speed and aperture selectors, respectively. A loose contact or failure of a signal lamp will therefore interrupt the corresponding circuit. **Replacing the lamps**. The lower half of the housing contains 2 signal lamps and 2 magnifying lenses as spares. In addition, it holds the socket wrench 831 (Fig. 4) for lamp replacement. For exchanging lamps the printed wiring board 825 need not be removed. 2

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plate

Proceed as follows:

Carefully remove the red magnifying lens above the defective lamp. Slip the socket wrench through the hole in the housing onto the lamp and turn it counterclockwise, applying only moderate pressure. Then remove it together with the lamp.

Introduce the new lamp with the wrench into the socket (press it down!) and turn it clockwise. Then remove the wrench by clockwise rotation. Replace the magnifying lens and check the control unit in conjunction with the shutter:

The lamp of the speed selector knob must light up during tensioning.

The lamp of the aperture selector knob must light up if a larger aperture is set than is available in the lens. The lamp must go out a few seconds after the end of the setting operation.

9. **Speed adjustment:** All control units are factory set so that they will give proper shutter speeds with any properly adjusted shutter. (See Instructions for Repairs on COMPUR electronic 5 FS, Sections 'Switch St' and 'Shutter speeds'). 2

If in exceptional cases readjustment should become necessary, proceed as follows: Check the shutter-contact adjustment of switch St and, if necessary, correct it. Check battery voltage (9 volts) $\frac{1}{15}$ sec by setting the potentiometer $P_2 = 2.5 K$ to the desired value.

$P_1 = 2.5 K$ can be used to readjust the $\frac{1}{8}$ sec, and

$P_3 = 1.0 K$ to readjust the $\frac{1}{30}$ sec.

The three potentiometers are located on the lower wiring board 825. (See Fig. 3). 2

If these three speeds are properly adjusted, all other speeds will be correct, provided that the shutter mechanism functions properly, i. e. the $\frac{1}{60}$ sec speed must lie within the prescribed tolerance.

10. The **spring clips 832 and 833** must have clean contacts (free from corrosion) and hold the batteries tightly. 1
11. **Batteries:** To ensure proper functioning of the electronic system of the shutter, use only LEAKPROOF 1.5-volt cells (for instruments).

International designation: IEC: R 14

For example: VARTA-PERTRIX No. 235

MALLORY-DURACELL MN 1400.

When inserting the batteries do not confuse plus and minus sides. The contours of the batteries must coincide with the schematic sketch in the bottom of the housing. 1

Battery check: The six series-connected batteries must deliver a voltage of 9.0 volts. The **battery tester 004** is switched on by pressing the red button. If the voltage is 9.0 volts, the pointer will move to the center of the black field.

The battery tester is so adjusted that the pointer will stand between the red and the black field when the voltage is 7.5 volts. If necessary, the pointer may be readjusted by means of the potentiometer P_4 (on the printed wiring board 830). The above voltages apply to the unloaded control unit (without shutter).

A drop in battery voltage to about 6.5 volts will change the shutter speeds only slightly within the tolerances allowed by DIN and ASA.

A drop below that value will cause shutter failure.

- *) Re 7. Printed wiring boards: Exchange of only one board may lead to variations in shutter speed (max. 5%). It is therefore advisable to replace the complete electronic unit, number 1032 10 000 825, i. e. both printed wiring boards, at a time. This unit also contains the socket 1032 20 801 896. The speeds need then not be adjusted as described under 9.

COMPUR - electronic**Instructions for repairs****Page 13****COMPUR - electronic 1****Cleaning of shutter**

All parts to be cleaned should be removed from the shutter and rinsed in clean, grease-free tri-chloroethylene or perchloroethylene.

Parts coated with anti-friction lacquer, the front plate, plastic parts, the printed circuit boards and the magnet should never be wet-cleaned. Use a soft chamois leather or brush.

Before reinstalling parts in the shutter, be sure they are completely dry and regreased in accordance with the lubricating instructions, if applicable.

Lubricating instructions

The necessary lubricants can be ordered from us. Other lubricants should not be used, as only those tested in our factory will ensure proper functioning of the shutters.

Apply a thin film of the prescribed lubricant to a glass plate and use a fine brush or foam-rubber swab to apply the lubricant with due care to the required point. In addition, the lubricant must be stirred briskly before use.

The lubricating chart CN-1331-000 indicates both the points to be serviced and the required lubricants (A and B).

Assembly and adjustment

Illustration plate
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Page

1. The **speed selector ring 539** must engage perfectly in the notches corresponding to the different speeds. Readjust the lock spring **167**, if necessary. 1
2. **Wiper 536** (on speed selector ring): The two springs must rest with sufficient pressure against the sliding tracks of the printed wiring segment **382** to ensure proper contact. Check with the speed selector ring removed (Fig. 3): 6
At a distance of 1.8 mm from the underside of the speed selector ring, the pressure exerted by each of the springs must be 25 ... 40 g. 3
The gold plating at the wiper-spring contacts must be neither damaged nor worn (contact resistance!).
3. The **blades 208, 267 and 268** as well as their bearings must be completely free from grease. In the illustrations, the order of insertion is marked (in Fig. 1) by the figures 1 to 5, starting at the lug of the blade ring **202** operating together with the thrust pawl of the drive 514. The blades 267 and 268 are slightly bent at their tips to improve their sliding properties. 10
4. The **spacer ring 176** and the **blade cover 116** are arrested by two pins in the base plate **201** (Fig. 1). 10
5. **Blade ring 202**. When placing the blade ring on the base plate, take care to ensure correct position of the blade ring closing spring **249** (Fig. 5). 10
6. The **diaphragm blades 105** and their bearings must be completely free from grease. Position the diaphragm blades so that the interior blade is tangent to the aperture diameter of 29 mm (Fig. 1). 8
9
7. The **shim 119** is held in position relative to the base plate by two pins. 8
The recess on top serves as a bearing for the diaphragm cover **106** (Fig. 1). 9

8. Position the **diaphragm cover 106** so that the tang is spaced about 45° (clockwise) from the dowel pin in the base plate (Fig. 2). 8
9. Firmly secure the **cover ring 142** by means of the screws **175**. The latter must not project from the ring. 8
10. The position of the **housing flange 101** in relation to the **base plate 201** is defined by two bores and two pilot pins. 8
11. The **diaphragm ring 108** is held in place by the screws **120**. Tighten the screws firmly without jamming the diaphragm ring. Apply a little lubricant A to the point where the screw head touches the diaphragm ring. 8
 The click stop must be clearly noticeable. Bend the lock spring **114**, if necessary. Unscrew the correction slide **110** only if absolutely necessary. Should this be the case, first mark its position in relation to the diaphragm ring. 9
 Aperture correction: If a part in the diaphragm assembly (diaphragm cover 106, diaphragm blade 105, blade cover 116 or diaphragm ring 108) has to be replaced, first measure the clear diameter at the widest possible aperture before starting to disassemble. Then check the assembly after it has again been put together for the aperture diameter found and correct it by the slide 110, if necessary.
12. The **tensioning lever 830** and the **tensioning pinion 517** must mesh in the position shown in Fig. 2 on page 3. 2
13. Via the armature lever and the escapement slide, the **magnet 378** must reliably intercept the drive in the open position of the shutter and hold it until the current to the magnet is cut off. 2
 Holding force at armature with magnet excited: $P = \text{min. } 400 \text{ g}$, the voltage at the magnet being 2.8 volts, which is equivalent to a battery voltage of approx. 3.0 volts. The magnet is movable in its mount. It should be adjusted so that in the escapement position (the armature being held by the magnet) there is an overlap of approx. 0.4 mm between the drive **514** and the escapement slide of the armature lever **370**. If the magnet is not energized, unsolder it from the printed wiring segment **382** and test it separately with the battery.
 If also this test is negative, it is necessary to exchange the magnet or the coil. If the magnet functions properly, the defect must be assumed to be in the printed wiring segment, probably in the control switch. (See also under "Power source".)
14. **Armature lever 370**. When the shutter is tensioned, the leaf spring of the armature lever **370** resting against the drive should press the armature firmly against the magnet. If necessary, increase the tension of the leaf spring by bending it. The force should be 250 . . . 350 g (Fig. 4). 2
 With the shutter tensioned, the entire surface of the armature should be in contact with the magnet. If necessary, bend the armature shaft accordingly. 3
15. **Escapement slide spring 344**. As the escapement slide starts moving, the force exerted should be 500 . . . 700 g to ensure that the impact of the drive is sufficiently damped (Fig. 4). 2
 3
16. **Printed wiring segment 382**. Before removing the segment, unsolder the two wires of the magnet coil (Fig. 5). If the segment has to be completely removed (e. g. for cleaning the shutter), also unsolder the four lead-in wires at the shutter-side terminals (Fig. 1). To secure the printed wiring segment, use the screws **304** and the nut **389**. 6
 Spare segments are available only as a complete unit. 3
 7

COMPUR - electronic**Instructions for repairs****Page 15**Illustration plate
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17. **Control switch.** This is held on the printed wiring segment **382** by a tubular rivet. The switch is of decisive importance for proper and reliable operation of the electronic escapement.
- The position of contacts 385 and 397 and the contact pressure at 397 is factory-set and should not be disturbed (Fig. 3).

6

7

Test values:

Contact pressure between spring 386 and contact 397 = min. 15 g Separation between spring 386 and contact 385 = 0.2 ... 0.3 mm.

Adjusting the control switch in the shutter:

For adjustment, only the contact spring **386** should be bent at the point indicated in the illustration 3. With the shutter in rest position — blade ring resting against the stop — the pressure at contact **385** should be $P = 20 \dots 40$ g. Make sure that the closing moment of the blade ring (produced by the blade-ring closing spring **249**) is greater than the resetting moment produced by the contact pressure.

7

As the blade ring moves, the contact 385 should break the circuit as soon as possible, but not later than at an aperture diameter of 1.0 mm. The instant of contact breaking affects the high, but delayed shutter speeds and should therefore be adjusted with great care.

18. **Blade-ring closing spring 249.** The resetting force at the blade ring **202** should be at least $P = 10$ g. It must in any case be greater than the resetting force of the contact spring 385 so that the blades are positively retained in their closed position.

6

19. **Shutter speeds** (see Table):

Top speed 1/500 sec: The blade ring is not delayed. In other words, the speed is primarily determined by the drive spring **515**. In the open position of the blades, it may be influenced by the blade-ring stop 288 (Fig. 1) that is mounted eccentrically. This stop, the so-called reflex stop, should be adjusted so that it becomes effective only at the beginning of the blade closing motion.

7

All other speeds are given by the electronic circuit of the printed wiring segment. Trimming by means of the potentiometer P 2 will either increase or reduce all the speeds (Fig. 1). Be sure **not** to touch the potentiometer P 1!

7

Exposure times (effective times t_e):

The tolerances given below are narrower than would be admissible in accordance with DIN or ASA.

Shutter speeds (to be measured with 3,5 voltage)

nominal value on selector ring	32	16	8	4	2	1				
upper limit	35.2	17.6	8.8	4.4	2.2	1.1	sec			
effective time (t_e)	32	16	8	4	2	1	sec			
lower limit	28.8	14.4	7.2	3.6	1.8	0.9	sec			
nominal value on selector ring	2	4	8	15	30	60	125	250	500	
upper limit	550	275	137.5	69.0	34.4	17.2	9.0	4.3	2.25	ms
effective time (t_e)	500	250	125	62.5	31.3	15.63	7.81	3.91	1.96	ms
lower limit	450	225	112.5	56.0	28.2	14.1	7.4	2.5	1.70	ms

The shutter has been adjusted with a battery voltage of 3.8 ± 0.4 volts, in which range it conforms to DIN and ASA specifications.

20. Power source

If possible, the Mallory type PX-21 mercury battery (4.5 v) should be used, which is claimed by the manufacturer to have a shelf life of over one year. If the battery voltage has dropped below the permissible limit, the magnet will no longer be able to keep the blades open in the open position of the shutter, so that they will return to their closed position right away.

If the type PX-21 is not available, other batteries for a voltage range of 2.6 to 6 volts may be used without harm to the electronic system. In this case, reproducibility of the different speed settings will be maintained.

Volts	Mallory	Philo	Ever-Ready	Matsu-shita	RCA	Japan	Burges	Pertrix (Pervox)	Rag-O-Vag
4.2	PX-2 TR-133 (TM)	P 133	No. 523 No. 531 E 133	KM-3A	VS 149	003 P	H 133		1304 M
4.5	PX-21							No. 247 3 pieces	
5.6	TR-164 (TM)		E 164		VS 164	004 P	H 164		

21. **Release 508:** With the selector ring **539** set to any desired speed, the following operations should unfold when the release is tripped. 4
- a) Blades closed; shutter tripped:
The tripping member must positively actuate the locking lever **510**, without rubbing against the latch **584**. If necessary, bend the tripping member (see adjusting point 1, Fig. 2). 5
- b) Blades open:
When operated the first time, the tripping member must actuate the locking lever **584** (the opening lever **262** is swung back by the spring **264**, the blades close). The tripping member should not rub against the locking lever. When tripped a second time, the operation is as described under a).
- c) Set to 'T'; blades opening:
The T-lever **503** swung out by the speed selector ring **539** should lift the tripping member **508** far enough to locate the pin of the opening lever **262** perfectly in the fork of the tripping-member thrust lever when the release is tripped.
If this function is not properly performed, adjust the pin of the T-lever **505** accordingly (see adjustment point 2, Fig. 3).
Closure of blades: same as under b).
22. The **pre-contact switch 366** is secured on the printed wiring board **382** by the screw **205**. 6
- When the release is pressed, contact must be made before the shutter is tripped (Fig. 2). 5
- The contact must be positively broken when the release rests against its stop in its rest position (Fig. 1). 5

COMPUR - electronic**Instructions for repairs****Page 17**Illustration plate
CN-1331-000
Page**23. Disconnecting switch 255**

The spring bank should be adjusted so that

6

a) with the blades closed, the contacts are closed by the opening lever **262** (Fig. 1),
and that

5

b) the contacts break when the blade tips have cleared an aperture of approx. 1.5 mm
diameter as the blades are opened by the lever 262.**24. X-contact:** This is automatically closed and opened by the X-contact lever **615**
(Fig. 2).

6

7

Contact clearance = min. 0.5 mm.

The X-contact closes when the blade tips clear an aperture diameter of between 26.0
and 29.0 mm.Any deviation from these values should be corrected by bending the contact spring
606.**25. The detent lever 242** should immediately lock the blade ring in its rest position after
a shutter cycle has been completed.

6

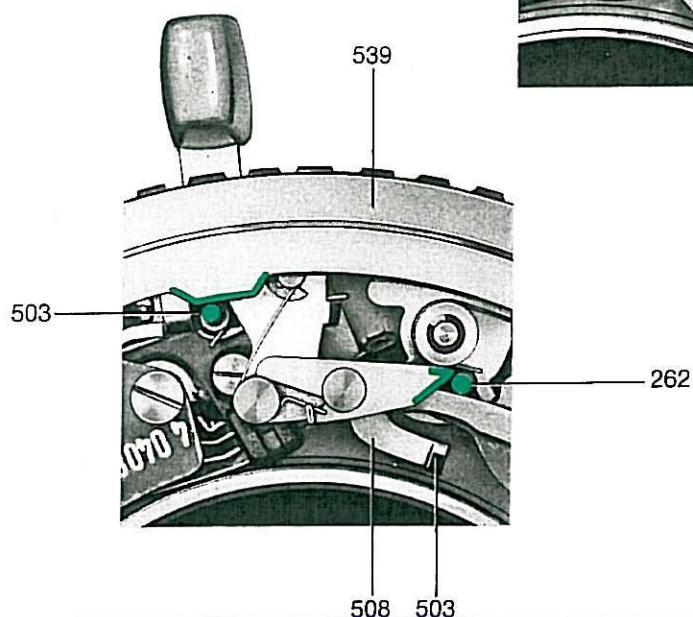
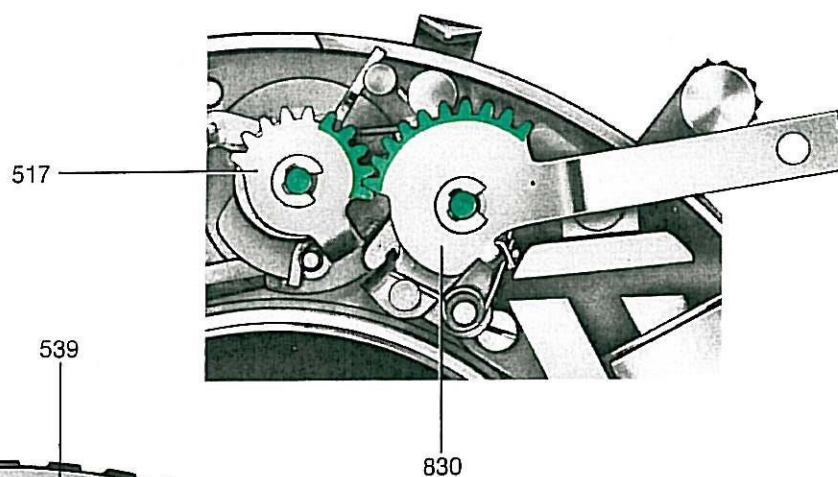
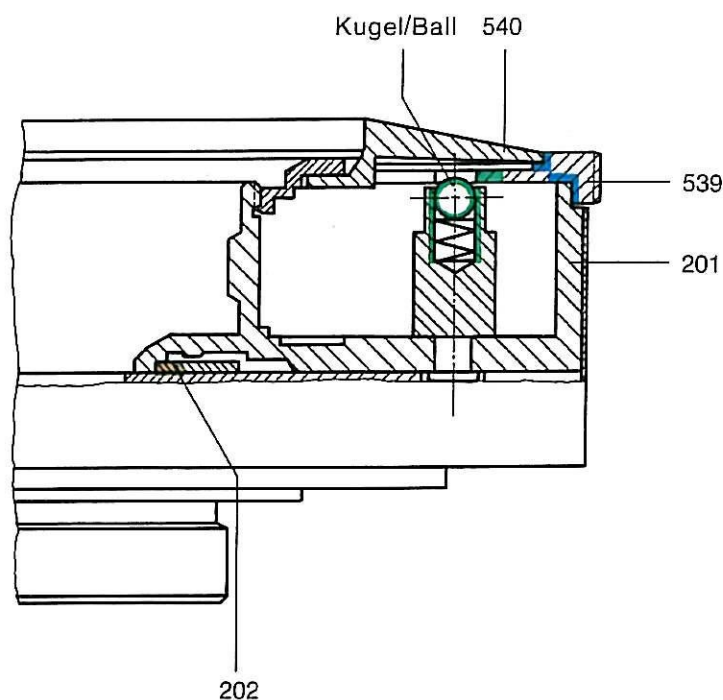
Resetting force at detent lever (in locked-in position): $P = 15 \text{ g to } 25 \text{ g}$ (Fig. 4).

7

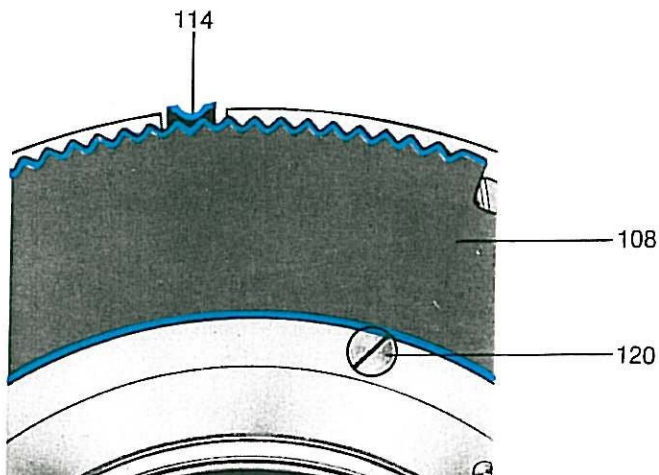
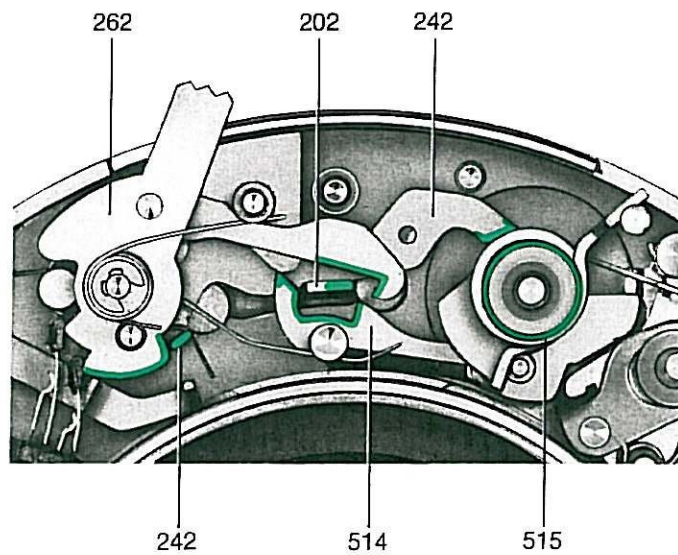
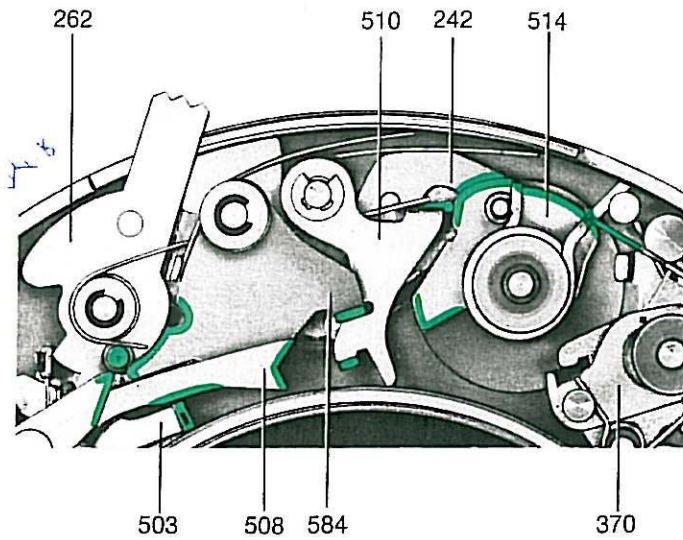
26. Concentricity and planar trueness testConcentricity: Maximum eccentricity between front and rear lens centering flanges:
0.02 mm.Planar trueness: Maximum wobble between front lens flange and rear lens flange:
0.025 mm.

Compur electronic 1 Schmierplan – Lubrication Schedule

CN-1331-000



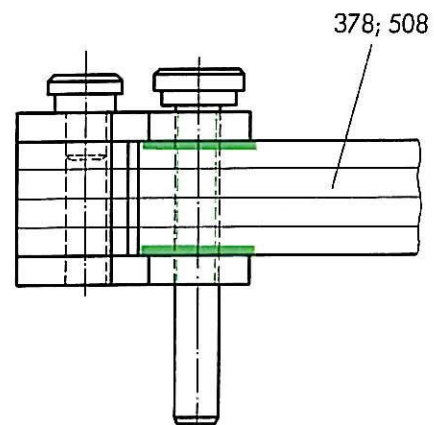
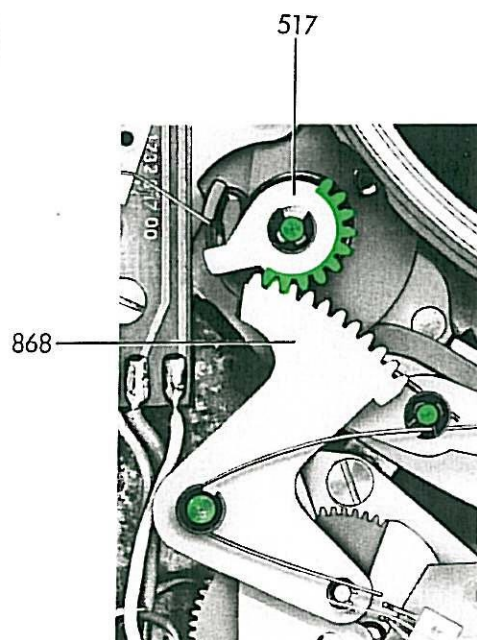
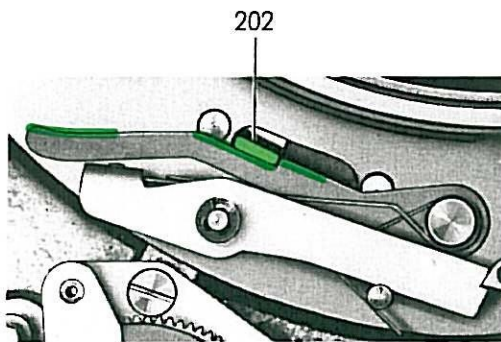
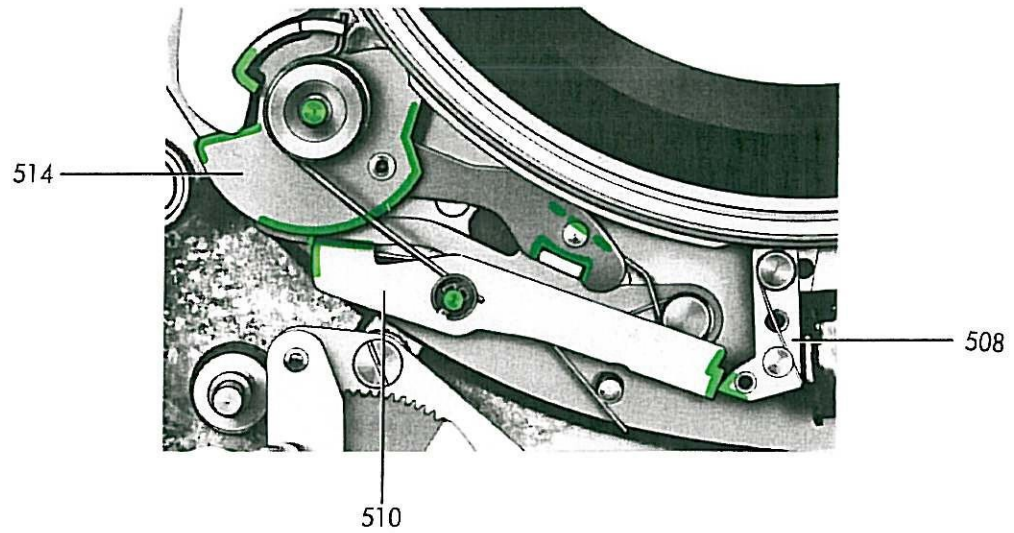
Schmierstoff A	■	Lubricant A
Schmierstoff C	■	Lubricant C
Öl E	■	Oil E



Schmierstoff A Lubricant A
Schmierstoff C Lubricant C

COMPUR electronic 5 FS
Schmierplan - Lubrication Schedule

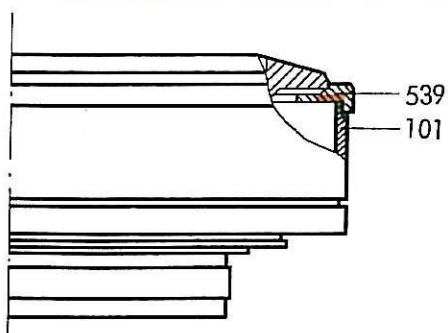
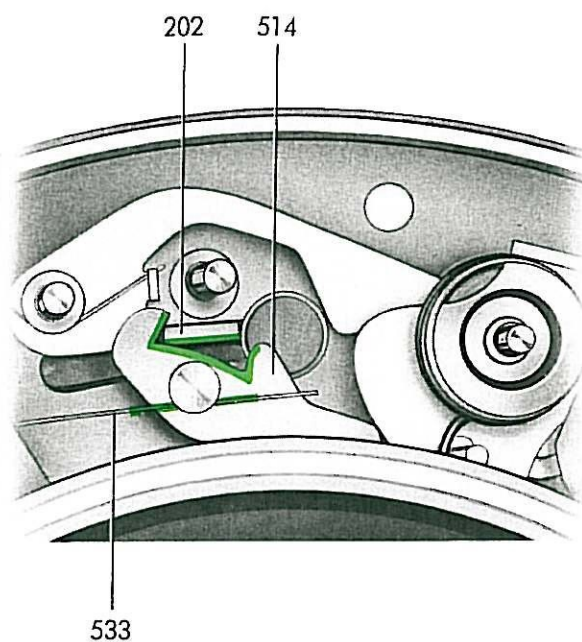
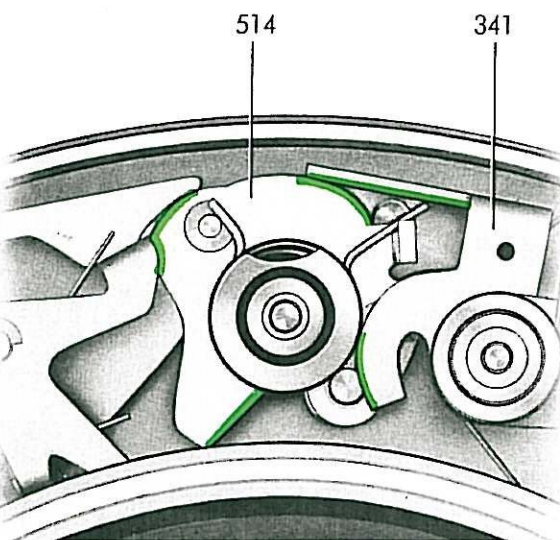
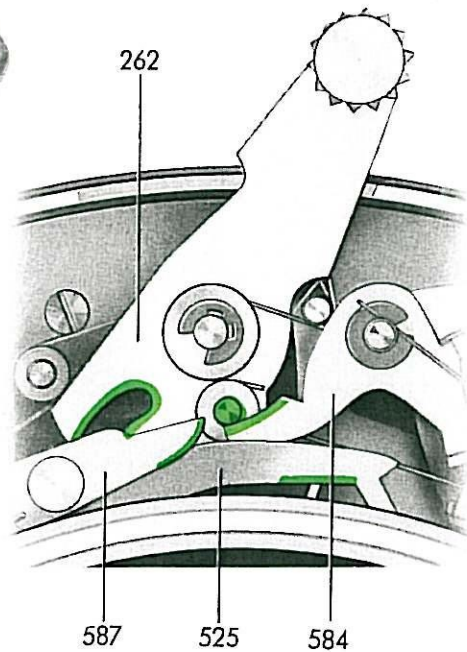
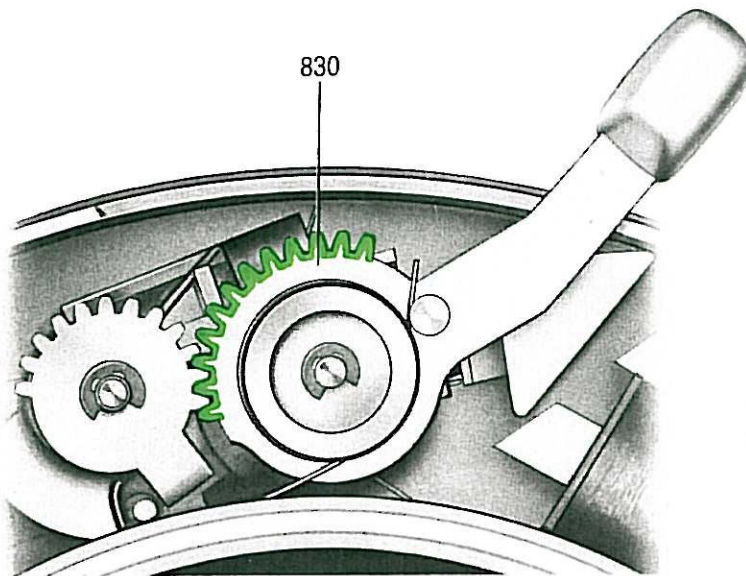
CN-1732-000



Schmierstoff A — Lubricant A

COMPUR electronic 3
Schmierplan — Lubrication Schedule

CN-1531-000

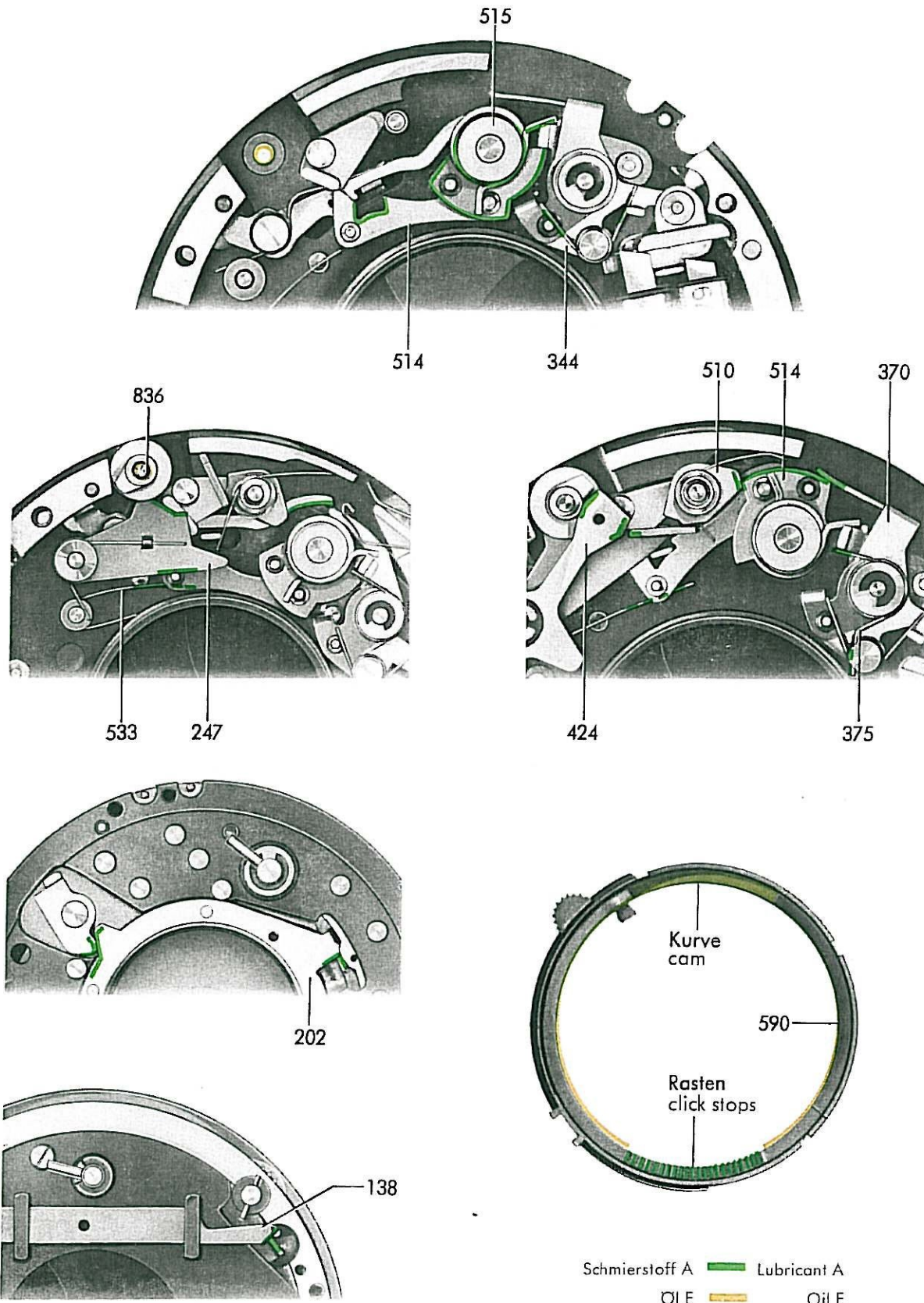
Schmierstoff A  Lubricant ASchmierstoff B  Lubricant B

COMPUR-WERK MÜNCHEN

COMPUR electronic-00-X Weit-Reflex

Schmierplan — Lubrication Schedule
 Spezialverschluß für Firma Kodak, Stuttgart
 Special shutter for Messrs. Kodak, Stuttgart

CS-1131-362



COMPUR-WERK MÜNCHEN

PARTS LIST Special shutters for

Kodak
Stuttgart

Supplement	Stock No.	Description	Qty.	Illustration		Type
				Plate	No.	
	1131 10 055 116 80	Blade cover	1	CS-1131-362/4	116	CS-1131-362 COMPUR-electronic 00-X Special Wide-Reflex with separate blade-opening mechanism COMPUR quick-change lens mounts
	1117 30 052 117 80	Blade cover screw	3	" /4	117	
	1131 30 055 136 80	Screw for setting pin	1	" /4	136	
	1131 30 055 137 80	Setting pin for slide	1	" /4	137	
(10)	1131 30 055 138 80	Slide	1	" /4	138	
(6) (9)	1131 10 055 201 82	Base plate	1	" /4	201	
	1131 10 055 202 80	Blade ring	1	" /4	202	
	1131 30 054 208 80	Blade	2	" /4	208	
	1131 30 055 225 81	Blade plate	1	" /4	225	
(10)	1131 30 055 245 81	Spring for detent lever	1	" /2	245	
	1131 10 055 247 80	Supporting lever	1	" /2	247	
	1131 30 055 249 80	Closing spring for blade ring	1	" /3	249	
	1131 30 055 251 80	Spring for supporting lever	1	" /2	251	
	1110 30 000 260 82	Stop spring, used for disconnecting strip	1	" /4	260	
		and terminal carrier	1	" /3	260	
	1131 30 054 267 80	Blade	3	" /4	267	
(6)	1131 30 054 344 83	Spring for escapement slide	1	" /3	344	
	1131 30 055 352 80	Eccentric bush	1	" /3	352	
	1131 30 054 362 80	Insulating sheat for magnet coil, colorless	1	" /3	362	
	1131 30 054 364 80	Insulating sheath for magnet coil, green	2	" /3	364	
	1131 30 054 365 80	Insulating sheath for magnet coil, yellow	1	" /3	365	
(6)	1131 10 054 370 81	Armature lever	1	" /3	370	
	1131 30 054 375 80	Spring for armature lever	1	" /3	375	
(6)	1131 10 054 378 82	Magnet	1	" /3	378	
	1131 30 055 380 80	Fillister head screw for magnet	1	" /3	380	
	1131 30 054 381 80	Spacer for magnet	1	" /3	381	
	1131 10 055 382 80	Terminal carrier	1	" /3	382	
(6)	1131 10 055 387 81	Disconnecting strip	1	" /4	387	
	1131 10 362 395 80	Printed wiring board	1			
	1131 30 054 424 80	V-connector	1	CS-1131-362/2	424	
	1131 10 055 510 80	Locking lever	1	" /2	510	
	1131 30 054 513 81	Locking lever spring	1	" /2	513	
	1131 10 055 514 81	Drive	1	" /2	514	
	1117 30 055 515 80	Drive spring	1	" /2	515	
	1117 30 052 533 82	Thrust pawl spring	1	" /2	533	
	1131 30 055 540 82	Cover plate	1	" /1	540	
	1916 30 004 542 81	Screw for engraving strip	2	" /1	542	
	1131 30 055 545 80	Tensioning tang	1	" /2	545	
(7)	1131 30 362 590 86	Aperture selector	1	" /1	590	
	1131 30 362 591 80	Engraving strip	1	" /1	591	
	1117 30 052 603 82	Insulating bush	1	" /3	603	
	1117 30 052 605 81	Contact pin	1	" /3	605	
	1117 30 052 606 83	Contact spring	1	" /3	606	

COMPUR-WERK MÜNCHEN

Supplement	Stock No.	Description	Qty.	Illustration		Type
				Plate	No.	
	1117 30 052 610 80	Insulating disc	1	" /4	610	See front page
	1131 30 055 611 80	Contact spring screw	1	" /3	611	
⑧ ⑨	1131 10 055 730 81	Bayonet retaining ring	1	" /1	730	
	1131 40 055 735 81	Spring for latch	1	CN-1110-030/1	735	
	1131 30 055 738 80	Outer cover ring	1	CS-1131-362/1	738	
	1110 30 034 739 80	Fillister head screw	3	CS-1131-362/1	739	
⑨	1131 30 055 740 80	Adjusting screw	1	" /1	740	
	1131 30 055 741 80	Ball stop spring	1	" /1	741	
	1131 30 055 742 80	Headless screw for stop spring	1	" /1	742	
	1131 30 055 743 80	Fillister head screw	3	" /1	743	
⑨	1131 30 055 744 80	Headless screw, left-hand thread	1	" /1	744	
⑨	1131 30 055 756 80	Compression spring	1	" /1	756	
	1131 30 055 757 80	Intermediate pinion	1	" /1	757	
	1131 30 055 761 80	Diaphragm opening ring	1	" /1	761	
⑪	1131 30 055 762 80	Disc	3	" /1	762	
	1131 30 362 771 80	Index ring	1	" /1	771	
	1131 30 055 787 80	Headless screw	1	" /1	787	
	1131 30 055 803 81	Opening lever spring	1	" /4	803	
	1131 30 055 822 80	Clamp screw for index ring	3	" /1	822	
	1117 30 052 834 81	Opening shaft pin	1	" /2	834	
	1131 10 055 836 80	Opening shaft	1	" /2	836	
	1131 30 055 838 81	Opening pinion	1	" /1	838	
	0,8 x 4,0 x 0,2 (similar to DIN 6799)	Locking washer	2	" /2	1)	
	1,2 DIN 6799	Locking washer	2	" /2/3	2)	
	1,9 DIN 6799	Locking washer	2	" /2	3)	
	1,5 mm III DIN 5401	Ball	1	" /1		

COMPUR electronic-00X- Weit-Reflex
für Firma Kodak, Stuttgart

COMPUR electronic-00X- wide-reflex
Special shutter for Messrs. Kodak, Stuttgart

CS-1131-362

Tafel 1

Plate 1

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
Supplement No. ○ See section □ of instructions for repairs

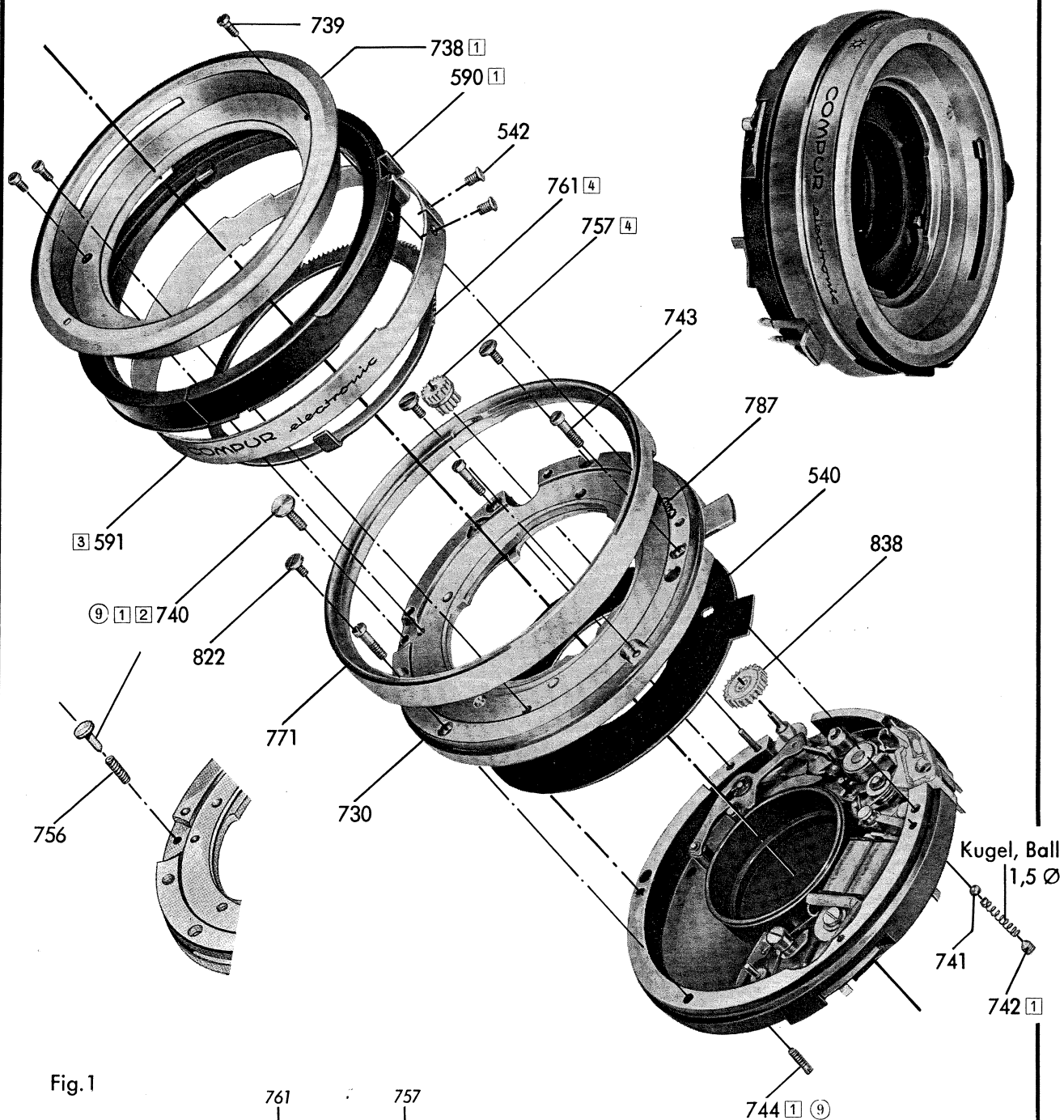


Fig. 1

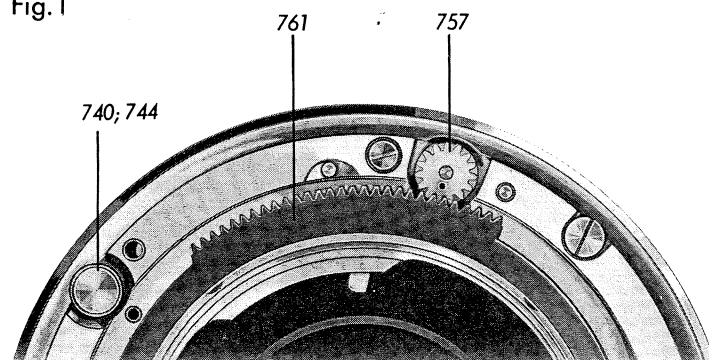
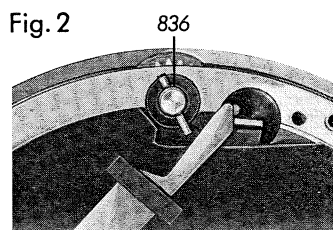


Fig. 2



COMPUR-WERK MÜNCHEN

COMPUR-electronic-00-X Weit-Reflex für Firma Kodak, Stuttgart

COMPUR-electronic-00-X wide-reflex Special shutter for Messrs. Kodak, Stuttgart

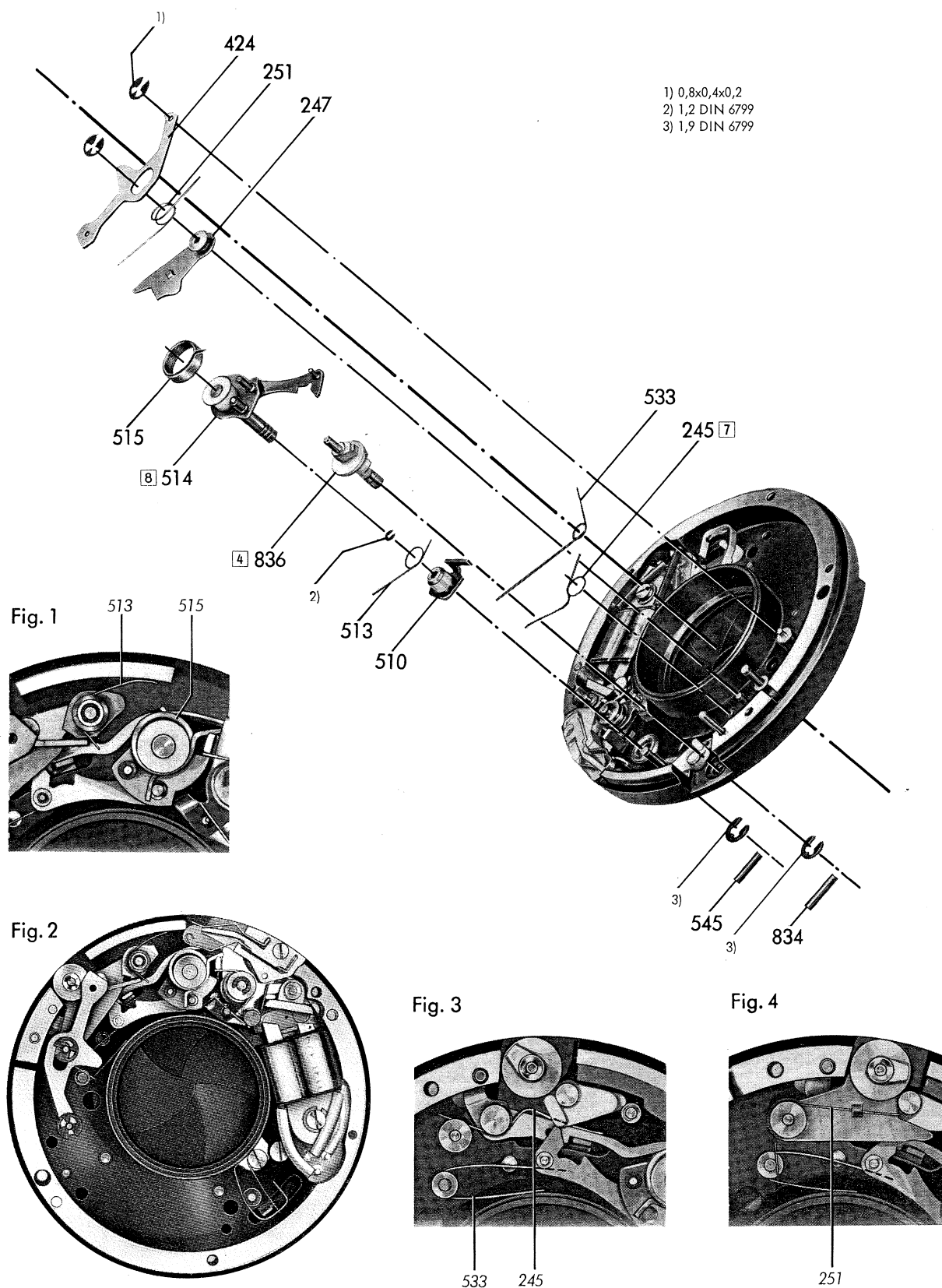
CS-1131-362

Tafel 2

Plate 2

Siehe Abschnitt □ der Reparaturanleitung

See section □ of instructions for repairs



COMPUR-WERK MÜNCHEN

COMPUR-electronic-00-X Weit-Reflex

für Firma Kodak, Stuttgart

COMPUR-electronic-00-X wide-reflex

Special shutter for Messrs. Kodak, Stuttgart

CS-1131-362

Tafel 3

Plate 3

Siehe Abschnitt □ der Reparaturanleitung

See section □ of instructions for repairs

* Farbcode der Isolierschläuche siehe Ersatzteilliste.
color code of flexible insulation tubes see spare parts list.

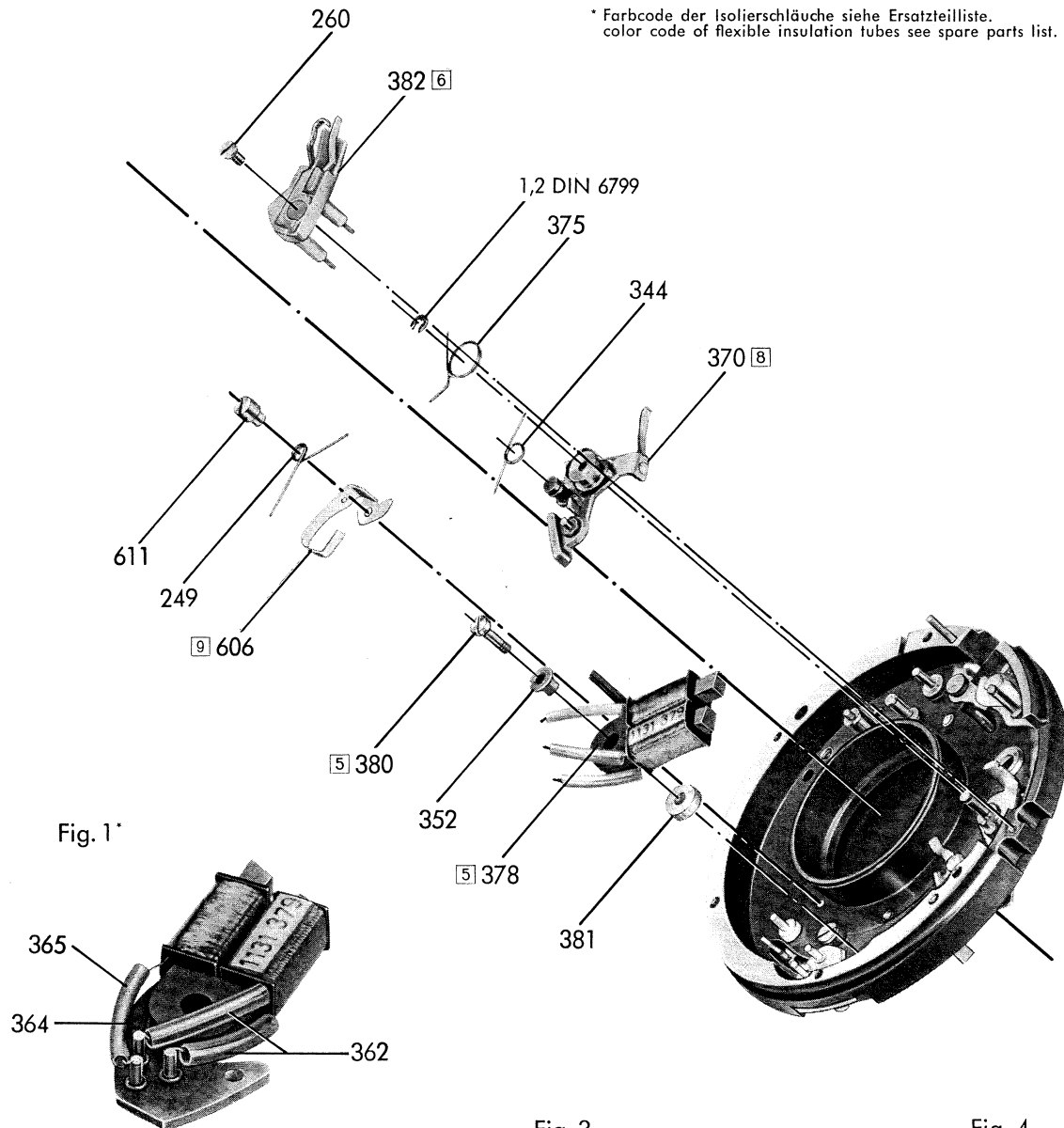


Fig. 1*

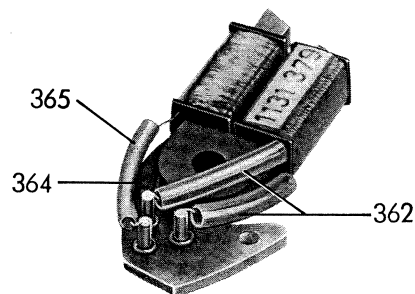


Fig. 3

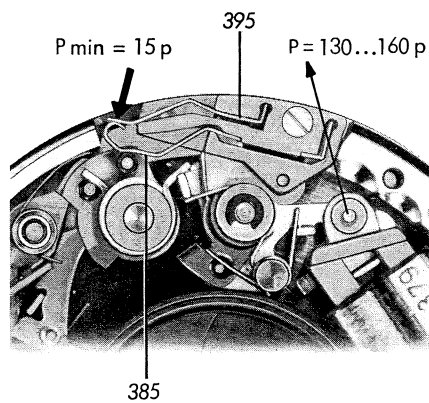
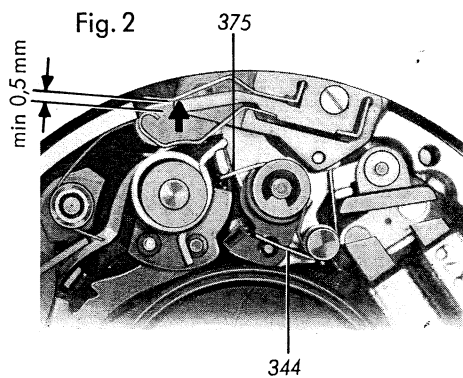
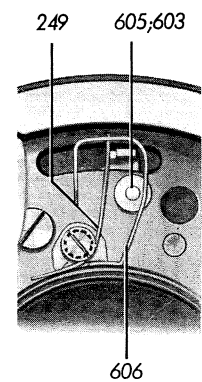


Fig. 4



COMPUR-WERK MÜNCHEN

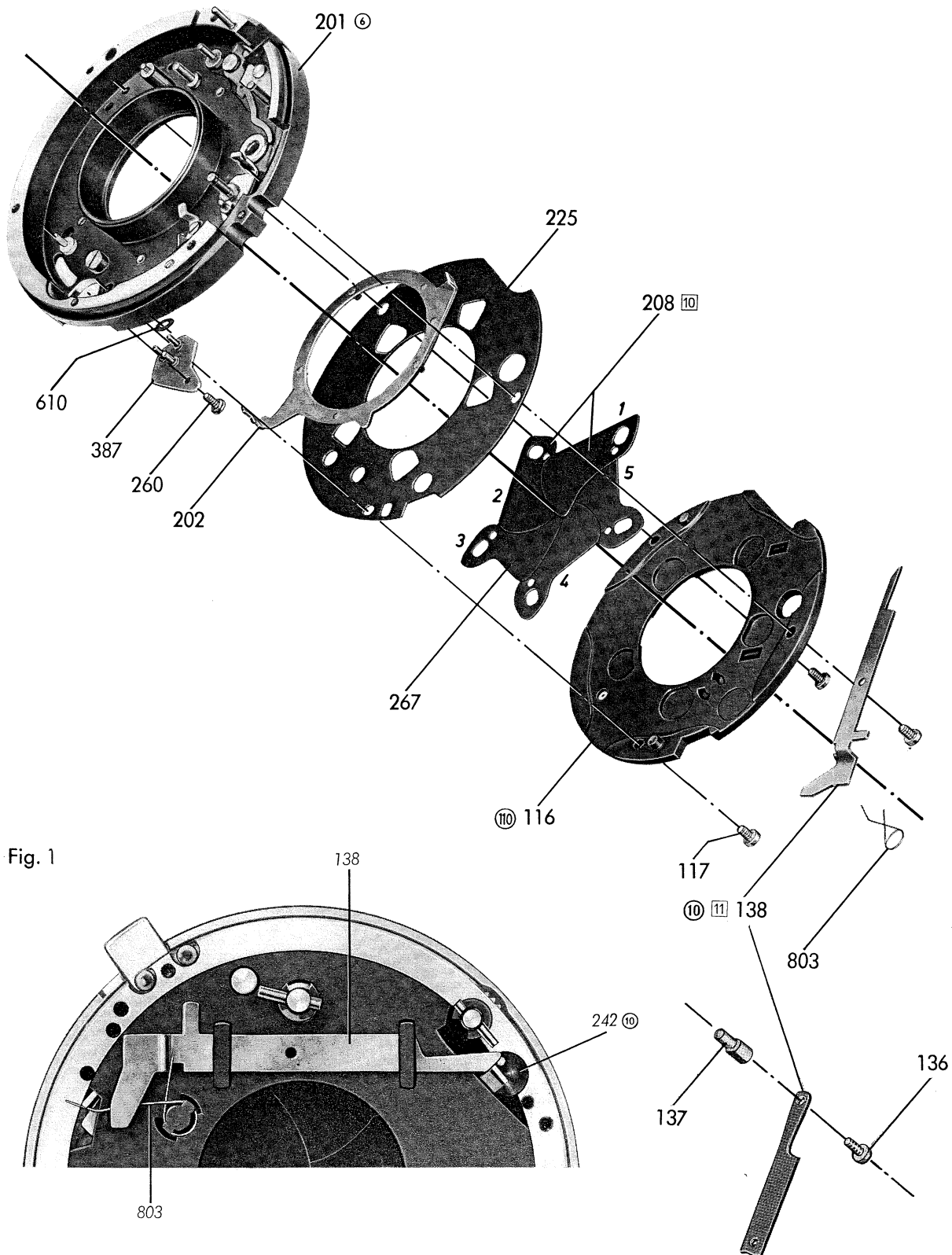
COMPUR electronic-00-X Weit-Reflex
für Firma Kodak, Stuttgart

COMPUR electronic-00-X wide-reflex
Special shutter for Messrs. Kodak, Stuttgart

CS-1131-362

Tafel 4
Plate 4

Anmerkung Nr. ○ siehe Abschnitt □ der Reparaturanleitung
Supplement No. ○ See section □ of instructions for repairs



COMPUR-WERK MÜNCHEN

COMPUR-electronic 00-X Wide-Reflex CS-1131-362
for Messrs. Kodak, Stuttgart

Cleaning of shutter

It is imperative to remove parts from the shutter for cleaning, which should be done by rinsing them in clean, grease-free trichloroethylene or perchloroethylene.

Parts treated with anti-friction lacquer, plastic parts, enameled parts and the magnet should never be wet-cleaned. Use a soft chamois leather or brush.

Before reinstalling parts in the shutter, be sure they are completely dry and regreased in accordance with the lubricating instructions.

Lubricating instructions

The necessary lubricants can be ordered from us. Other lubricants should not be used, as only those tested in our factory will ensure proper functioning of the shutters.

Apply a thin film of the prescribed lubricant to a glass plate and use a fine brush or foam rubber swab to apply the lubricant to the required point. In addition, the lubricant must be stirred briskly before use.

The lubricating chart CS-1131-362 indicates both the points to be serviced and the required lubricants (A and B).

CS-1131-362
Plate

Assembly and adjustment

1. The **aperture selector 590** must engage perfectly in the notches corresponding to the different f-stops. The locating moment can be set with the aid of the grub screw **742**. The stiffness of its motion (torque) can be varied by securing the engraving strip **591** in the appropriate position. The vertical play of the aperture selector should be 0.03 ... 0.08 mm. The **adjusting screw 740** is provided as a means to control vertical play.
2. Align the **engraving strip 591** so that the center of the "8" is above the index line (see also para. 1).
3. The **headless screw 744** has a left-hand thread. The screw serves to lock the adjusting screw **740**.
4. Both the **diaphragm opening ring 761** and the **intermediate pinion 757** have a mark at their teeth and must be meshed in the position shown in Fig. 1. Prior to meshing, the opening shaft **836** must be positioned as shown in Fig. 2 (shutter untensioned).

1

1

1

1

2

Testing the completely mounted shutter:

The opening shaft **836** must reach its stop on either side without the lug of the opening ring **761** resting against the recess in the outer cover ring **738**. On both sides the pin **834** resting against the blade plate **225** acts as a stop.

Should this condition not be satisfied, the intermediate pinion **757** must be slipped on in another position. For testing the different positions and accurate setting use the gage LZ 1 1331 362.

5. **Magnet 378**. The resistance of the two series-connected coils is approx. 80 ohms (for soldering terminal see Fig. 1). Holding force at armature of magnet at a voltage of 2.2 volts: P = min. 400 g.

3

CS-1131-362
Plate

Setting of magnet:

The magnet can be shifted along its longitudinal axis after loosening the mounting screw **380** by turning the eccentric bush **352**.

a) When the shutter is tensioned, the armature must rest with its entire surface against the core of the magnet (contact faces must be clean). The leaf spring of the armature lever **370** must ensure perfect contact of the armature. Force at armature shaft with armature lever spring in position P = 130 – 160 g (Fig. 3).

b) In escape position the overlap between the impact surfaces of drive and escape-ment slide must be about 0.6 mm.

Testing for proper operation:

When the magnet is energized, it must positively intercept and hold the released drive in the "open position" of the shutter. After the current to the magnet is cut off, the armature lever spring **375** must quickly swing back the armature lever **370** and release the drive.

6. **Terminal carrier 382** (switch). The contact springs have been adjusted in the factory. The contact should break without delay as the drive motion starts. If necessary, readjust the projecting front end of the outer spring **385**. When the contact is open, the springs **385** must rest against the terminal carrier (for pretensioning, see Fig. 2). When the contact is closed, the spring **385** must have lifted off by about 0.2 mm. (Fig. 3). Contact pressure should be at least 15 g. The inner spring **397** should not be changed, except for a possible correction of the contact clearance, which should not be less than 0.5 mm. The drive (pin) must swing out the spring without pushing. 3
7. After the shutter has run down, the **detent lever spring 245** must quickly swing in the detent lever **242** and arrest the blade ring **202** (no second exposure!). 2
8. **Armature lever 370** and **drive 514**. If one of these two parts is exchanged, check magnet setting (see magnet 378). 3 a. 2
9. **X-contact spring 606**. The X-contact must be closed when the tips of the blades are between an opening diameter of 19.5 mm and full aperture. 3
10. The **blades 208 and 267** as well as their bearings must be completely free from grease. In the illustration, the order of insertion is marked by the figures 1 to 5, starting at the opening shaft **836**. 4
11. When the shutter is tensioned, the **slide 138** must be positively returned to its original position by the spring **803**. 4
12. **Speed measurement, power source and printed wiring board 395**. See pertinent sections of the instructions issued by Kodak for repairs on the Instamatic Reflex camera.
13. **Concentricity test**
Maximum eccentricity between bayonet retaining ring **730** (centering diameter for quick-change lens mount) and base plate **201** (diameter 23.6 mm) : 0.09 mm.