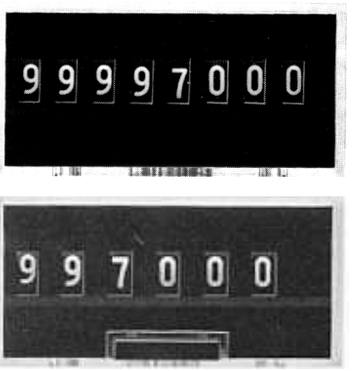
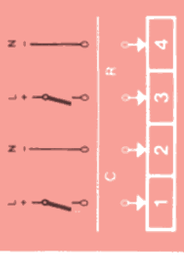


Electromechanical totalizing counters CRG

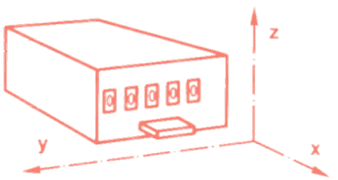
Connection diagrams

no reset or with manual reset

with electrical or manual and electrical reset



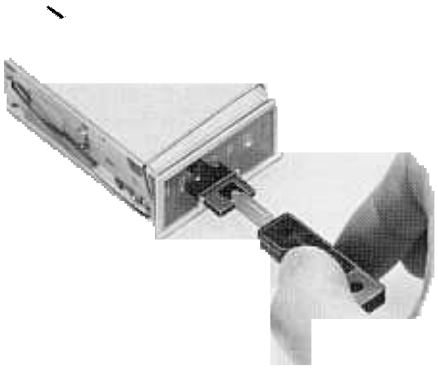
Important:
To provide protection for the impulse generator (count and reset), a spark suppression should be provided with direct current supply (see page 30).



General data

Count	
Counting capacity	999, 9,999, 99,999, 999,999 or 99,999,999
Counting direction	up
Counting frequency max.	10 i/s, 25 i/s or 50 i/s (DC) 15 i/s (AC)
Value per impulse	1:1 Special: 2:1, 3:1, 4:1, 5:1; for 6-digit counters also 25:1 and dozens counting is available
Display	Wheels; white figures on black background, 2×4 mm Special: with fixed decimal point .9, .99, .999 with symbols, units, static zeros, etc. (on request) other figure colours (on request)
Reset	Non-reset, manual, manual with key, electrical, or combined manual and electrical
Life expectancy	Count: 1,000 million impulses for the version 10 i/s 350 million impulses for the version 25 i/s 200 million impulses for the version 50 i/s Reset: 1 million electrical reset operations
Mounting	– flush mounting with clamping spring (including a set of separate terminals) – surface mounting with fixing nut (basic housing, without terminals) – flush or surface mounting with fixing socket (basic housing, without fixing socket or additional accessories) – flush mounting, plug-in by means of a fixing frame (basic housing, without fixing frame or protective case) – plug-in mounting on printed circuits (basic housing, without soldering lugs) In any mounting position. See pages 10–12 'Dimensional drawings' for all details.
Connection	– by means of separate terminals for soldering or clamping – by means of soldering lugs for printed circuits – by means of tags (2.8×0.8 mm) for push-on connectors or soldering; on the fixing socket, fixing frame and protective case See pages 10–12 'Dimensional drawings' for all details.
Ambient temperature	Operation: −10 °C to +50 °C
Climatic conditions	Climate type G according to DIN 40040
	Operational reliability: 5 g at axes y and z, 2 g at axis x, according to IEC 68-2-6, test FC in 3 planes at 10...500 Hz
Protection class (front)	According to DIN 40050: IP 65 for versions without button, IP 40 for versions with button (IP 65 by means of protective case, see page 12)
Approbations	UL recognized (file nr. E53905, vol. 1, sec. 2)
Weight	approx. 115 g without reset approx. 130 g with manual reset approx. 185 g with electrical reset

CRG



Manual reset using key.

The fixing frame with clamping spring for plug-in mounting; connection by means of tags (2.8×0.8mm) for push-on connectors or for soldering.

The protective case class IP65 (front) for plug-in mounting; the rigid cover can be opened either by pushbutton or key.

Electrical data

Inputs (count and reset)

Supply voltage (U_N)

DC: 6V, 12V, **24V,** 36V, 48V, 60V, 110V, 220V
residual ripple max. 48%;
voltage tolerance −15%/+10%
(for the version 50i/s: ±10%)

AC: 24V, 100...115V, 220...240V; 50/60Hz
voltage tolerance −15%/+10%

Power consumption

Count: 1.3W for the versions 10i/s, 6...24VDC
1.7W for the versions 10i/s, 36...110VDC
3W for the versions 10i/s, 220VDC
and all 25i/s DC versions
7W for the versions 50i/s DC
3.5VA for the versions 15i/s AC

Reset: 7W (DC) respectively 7VA (AC)

Impulse generator types: Contacts, electronic sensors NPN, PNP or for alternating current (see page 31 for SAIA®Proximity Switches)

Impulse data

	Count 10i/s (DC)	25i/s (DC)	50i/s (DC)	15i/s (AC)	Reset DC	AC
Impulse length	min. 40ms	min. 18ms	min. 10.5ms	min. 30ms	min. 150ms	min. 200ms
Impulse interval	min. 40ms	min. 18ms	min. 7.5ms	min. 30ms	min. 100ms	min. 100ms

Note: Count and reset mechanisms are not to be simultaneously actuated. No mechanical damage will ensue but the unit wheel can fall between two places necessitating a reset operation under required conditions.

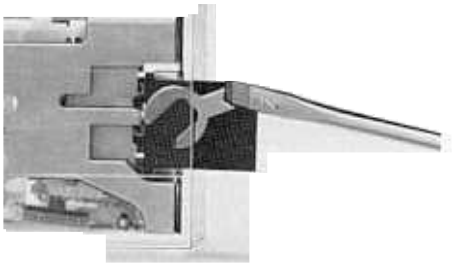
Duty cycle: Count: 100% (60%, max. 5min, for the version 50i/s)
Reset: 60%, max. 5min

Insulation voltage: 1.5kVAC (6...48V) respectively 2.5kVAC (60...240V) according to VDE435

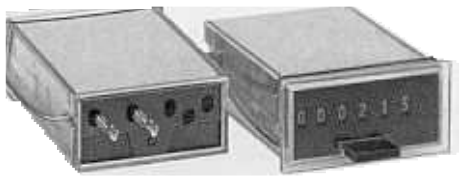
Coil resistance (DC)

Supply voltage	6VDC	12VDC	**24VDC**	36VDC	48VDC	60VDC	110VDC	220VDC
Count 10i/s	30Ω	100Ω	430Ω	750Ω	1500Ω	2400Ω	8200Ω	16000Ω
25i/s	10Ω	47Ω	**180Ω**	390Ω	750Ω	1200Ω	3900Ω	16000Ω
50i/s	4.7Ω	20Ω	82Ω	180Ω	330Ω	510Ω	1600Ω	6800Ω
Reset	4.7Ω	20Ω	**82Ω**	180Ω	330Ω	510Ω	1600Ω	6800Ω

SAIA



All CRG and CRT counters with manual reset have a catch incorporated in the pushbutton. This catch prevents unintentional resetting.



Flush/panel mount complete with clamping spring and set of separate terminals for soldering or crimping.

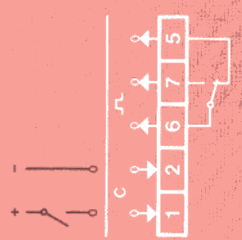
Basic housing with fixing nut. Various mounting configurations illustrated on pages 10 and 11.

Outputs

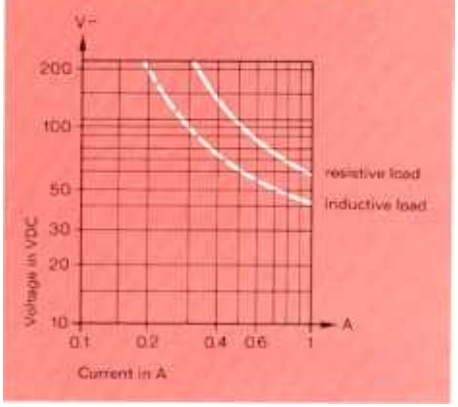
Type of outputs	– Zero reset contact: at each manual zero reset operation a signal is given via a changeover contact (this output is only possible on 6-digit, DC, manual reset versions) – Armature contact: at each counting impulse a signal is given simultaneously via a changeover contact (this output is only possible on 6-digit, DC, 25 i/s, manual or non-reset versions) **Note:** Zero reset contact and armature contact in the same counter is not available.	
Breaking capacity	Direct current:	see adjacent graph; max. current 1 A
	Alternating current:	1 A/250 VAC (AC 1, resistive load) 0.1 A/250 VAC (AC 11, inductive load) $P_{max.}$ (resistive) 250 VA according to VDE 0660, sections 1 and 2
Life expectancy	mechanical: 50 million operations electrical: 0.8 million operations at max. breaking capacity With an inductive load a spark suppression is imperative for protection of the contacts (see page 30).	
Connection diagram		

Connection diagram

with zero reset contact or armature contact



Breaking capacity direct current



Important:

To provide protection for the impulse generator (count) and the output contact (with an inductive load), a spark suppression should be provided (see page 30).

CRG

Ordering details

Dimensions (front)	Counting capacity	Reset	Flush mounting[1])	Basic housing[2])
24×28 mm	999	manual	CRG 132[3])	CRG 131[3])
	9,999	none	CRG 042[3])	CRG 041[3])
24×38 mm	9,999	manual	CRG 142	CRG 141
	99,999	none	CRG 052	CRG 051[4]) without button: CRG 057
	999,999	none	CRG 066	CRG 065
24×48 mm	99,999	manual	CRG 152	CRG 151
		manual with key	CRG 852	CRG 851
		electrical	CRG 252	CRG 251[4]) without button: CRG 257
		manual and electrical	CRG 352	CRG 351
	999,999	none	CRG 062	CRG 061[4]) without button: CRG 067
		manual	**CRG 162**	CRG 161
		manual with key	CRG 862	CRG 861
		electrical	**CRG 262**	CRG 261[4]) without button: CRG 267
		manual and electrical	CRG 362	CRG 361
	99,999,999	none	**CRG 082**	CRG 081[4]) without button: CRG 087

[1]) complete with clamping spring and separate terminals
[2]) with fixing nut, without accessories for mounting and connection
[3]) for versions 10 i/s respectively 25 i/s only (DC)
[4]) version with button (used for withdrawing the counter in plug-in mounting)

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
C	R	G										N

Supply voltage

L6	6 VDC	N1	48 VDC	B4	24 VAC, 50/60 Hz
M1	12 VDC	N2	60 VDC	C1	48 VAC, 50/60 Hz
M4	**24 VDC**	N8	110 VDC	D1	100...115 VAC, 50/60 Hz
M6	36 VDC	P4	220 VDC	E1	220...240 VAC, 50/60 Hz

Outputs

N without output
Q with armature contact[1])
R with zero reset contact[2])

[1]) only possible for CRG 062/061/067, CRG 082/081, CRG 162/161 and DC 25 i/s or AC 15 i/s
[2]) only possible for CRG 162/161

Counting frequency max.

1 10 i/s (DC) **2 25 i/s (DC)** respectively 15 i/s (AC) 3 50 i/s (DC)

Value per impulse

N	**1:1**	R	4:1	T	dozens counting[1])
P	2:1	S	5:1	U	25:1[1])
Q	3:1				

[1]) for 8-digit counters only (excl. CRG 066 and CRG 065)

0 without decimal point 1 with decimal point .9
2 with decimal point .99
3 with decimal point .999

Note:
- The bold typeface denotes the standard versions.
- Accessories for mounting and connection to the basic housing have to be ordered separately, see pages 10–12 'Dimensional drawings' for all details.
- Other special versions on request (other figure colours; symbols, units, static zeros with the display; other supply voltages).

Ordering can be by means of the above ASN-code or by product description.

Example: Electromechanical totalizing counter CRG 161
24 VDC, with zero reset contact, 25 i/s
or CRG 161 M4 R2N0N
in addition e.g. part number CJ 205 (fixing socket)

Time impulse counters CRT

The CRT is available with two different basic functions:

- as a counter of time impulses
- as counter for measuring short time intervals.

In construction it corresponds to the totalizing counter CRG for direct current with 6 wheels and the 24×48 mm housing. For this reason the technical data is reduced to the essential details.

Time impulse counter

These versions possess special wheels with an appropriately printed facia to enable the recorded time impulses to be correctly read. The following variants are available:

Display	Time impulse frequency	Time unit	Counting capacity
h min sec ⅒	10 i/s	0.1 s	11 h 59 min 59.9 s
h min sec	1 i/s	1 s	99 h 59 min 59 s
h min	1 i/min	1 min	9999 h 59 min
h ⅒	1 i/6 min	0.1 h	99,999.9 h
h	1 i/h	1 h	999,999 h

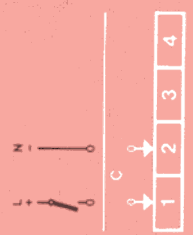
Counter for measuring short time intervals

This version is suitable for measuring shorter intervals of time up to 2 h 45 min. The mains supply frequency of 50 Hz is used as a time base for this purpose.

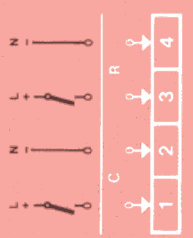
Display	Time impulse frequency	Time unit	Counting capacity
sec 1/100	50 i/s	0.02 s	9999.98 s

Connection diagrams

no reset or with manual reset



with electrical reset



General data

Display	Wheels; white figures on black background, 2×3 mm; printed facia
Reset	To zero; none, manual, manual with key, or electrical

Mounting, connections, etc. see CRG, page 4. See pages 10–12 for dimensional drawings

Electrical data

Supply voltage (U_N)	Time impulse counters: 6 VDC, 12 VDC, **24 VDC,** 48 VDC, 60 VDC, 110 VDC, 220 VDC residual ripple max. 48%; voltage tolerance −15%/+10% Counters for measuring short time intervals: 24 VAC, 100...115 VAC, **220...240 VAC; 50 Hz** voltage tolerance −15%/+10%
Power consumption	Time impulse counters: count 3 W, reset 7 W Counters for measuring: count 3.5 VA, reset 7 VA

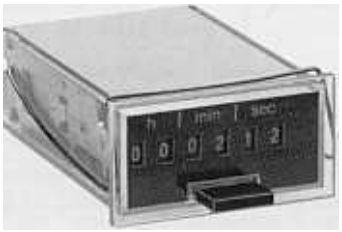
Impulse data	Time impulse	Reset Time impulse counter	Counter for measuring
Impulse length	min. 18 ms	min. 150 ms	min. 200 ms
Impulse interval	min. 18 ms	min. 100 ms	min. 100 ms

Insulation voltage, coil resistance see CRG, page 5.

CRT

Ordering details

Counter for measuring short time intervals with electrical reset and for flush mounting by means of clamping spring.



Time impulse counter for an impulse frequency of 1 i/s, with manual reset and flush mounting by means of clamping spring.

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
C	R	T		6				N	0		7	N

Type of reset

0 none
1 manual
2 electrical
8 manual with key

Type of mounting and housing

2 Flush mounting,
complete with clamping spring and separate terminals

1 Basic housing with fixing nut, without accessories for mounting and connection

Supply voltage

Time impulse counters

L6	6VDC	N1	48VDC
M1	12VDC	N2	60VDC
M4	**24VDC**	N8	110VDC
		P4	220VDC

Counter for measuring short time intervals

B4	24VAC/50Hz
D1	100...115VAC/50Hz
E1	**220...240VAC/50Hz**

Frequency of time impulse

Time impulse counter

J	10i/s	M	1i/6min
K	**1i/s**	N	1i/h
L	**1i/min**		

Counter for measuring short time intervals

F 50i/s (mains supply frequency)

Note:
- The bold typeface denotes the standard versions.
- Accessories for mounting and connection to the basic housing have to be ordered separately, see pages 10–12 'Dimensional drawings' for all details.

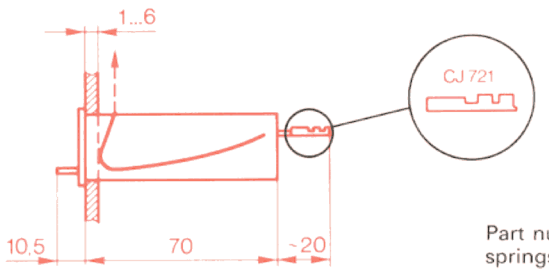
Ordering can be by means of the above ASN-code or by product description.

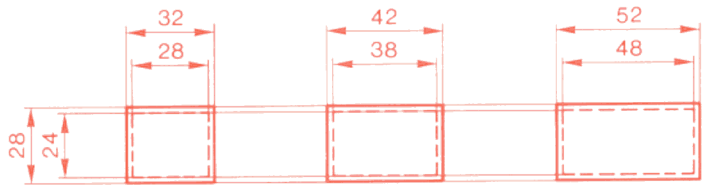
Example: Time impulse counter, with manual reset by key, flush mounting, 24VDC, 1i/min
or
CRT862 M4 N0L7 N

Dimensional drawings CRG/CRT

Flush mounting by means of clamping spring

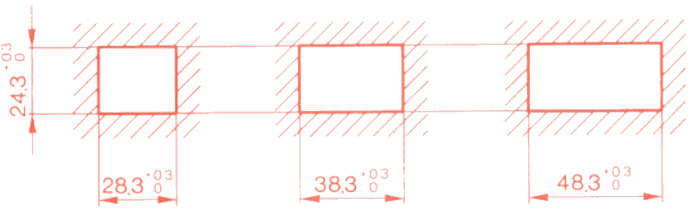
(complete with clamping spring and separate terminals CJ 721)





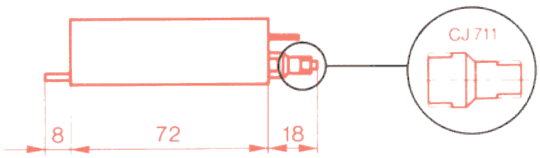
Part number for clamping springs (replacement): CJ 501 CJ 502 CJ 503

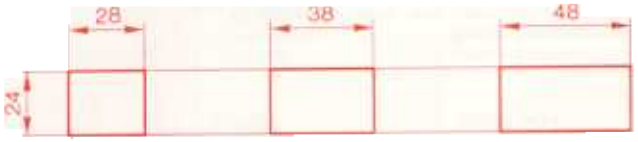
Panel cutouts



Dimension of the basic housing

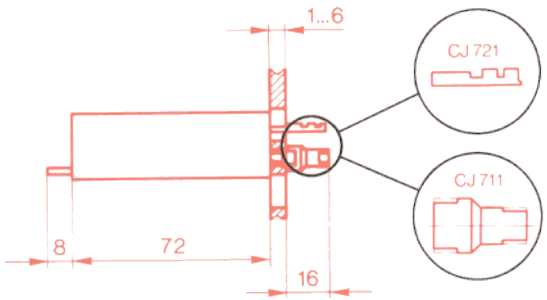
(including fixing nut CJ 711)

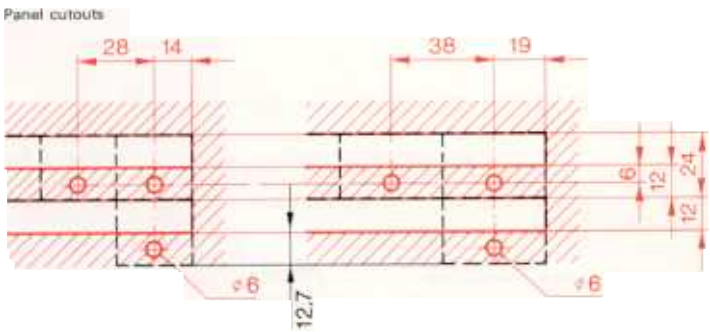




Surface mounting by means of fixing nut

(only possible for counters 24×28 mm and 24×38 mm)





Connection by means of separate terminals (to be ordered separately), part number CJ 721

CRG CRT

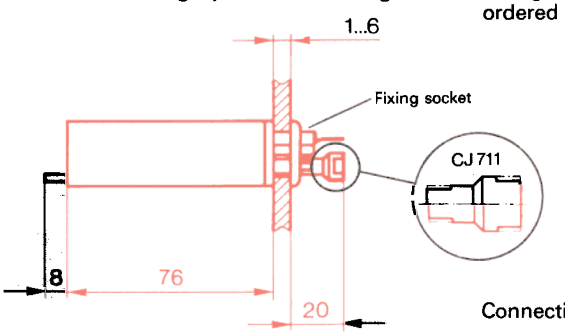
Surface mounting by means of fixing socket

Fixing socket has to be ordered separately

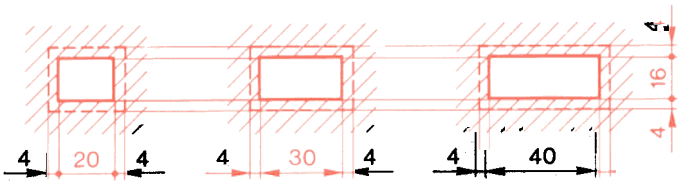
Part number: CJ 202

Part number: CJ 203

Part numbers: CJ 204 (4 pin) CJ 205 (5 pin)



Panel cutouts



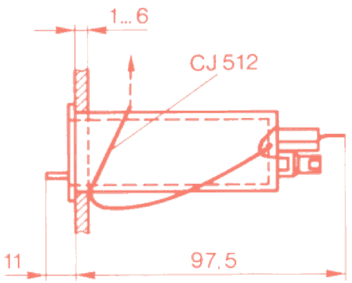
Connection by means of tags (2.8×0.8 mm) for push-on connectors or soldering

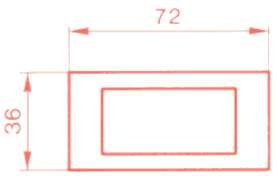
Flush mounting, plug-in by means of fixing frame

for 1 counter 24×48 mm, fixing by means of clamping spring

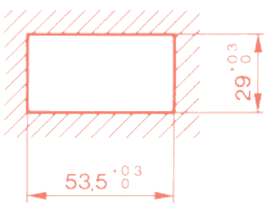
Fixing frame has to be ordered separately:

Part number
CJ 104 for 1 counter 24×48 mm, 4 pin
CJ 105 for 1 counter 24×48 mm, 5 pin





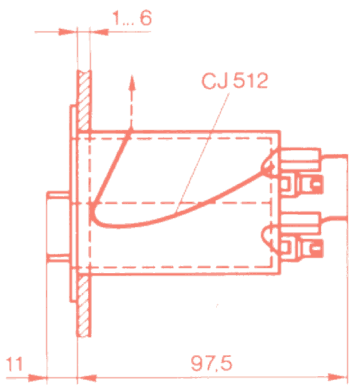
Panel cutouts

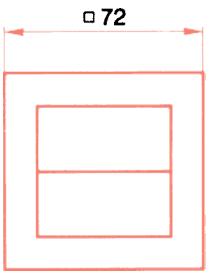


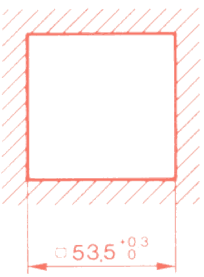
for 2 counters 24×48 mm, fixing by means of clamping spring

Fixing frame has to be ordered separately:

Part number
CJ 110 for 2 counters 24×48 mm





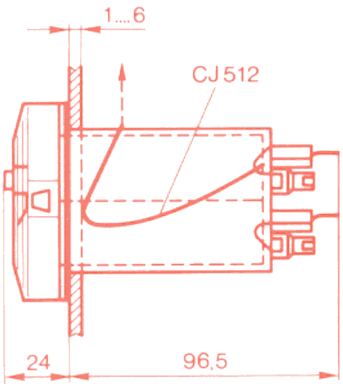


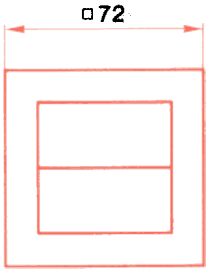
Connection by means of tags (2.8×0.8 mm) for push-on connectors or soldering

Flush mounting, plug-in by means of protective case

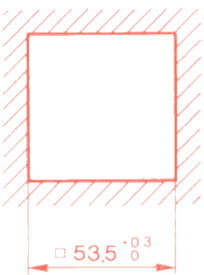
- Protection class (front): IP 65 according to DIN 40050
- The transparent, rigid cover can be opened either by pushbutton or key
- Fixing by means of clamping spring
- For 2 counters 24×48 mm
- Connection by means of tags (2.8×0.8 mm) for push-on connectors or soldering

Protective case has to be ordered separately: part number CJ 310

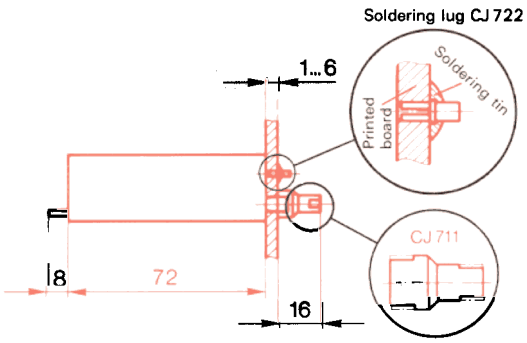




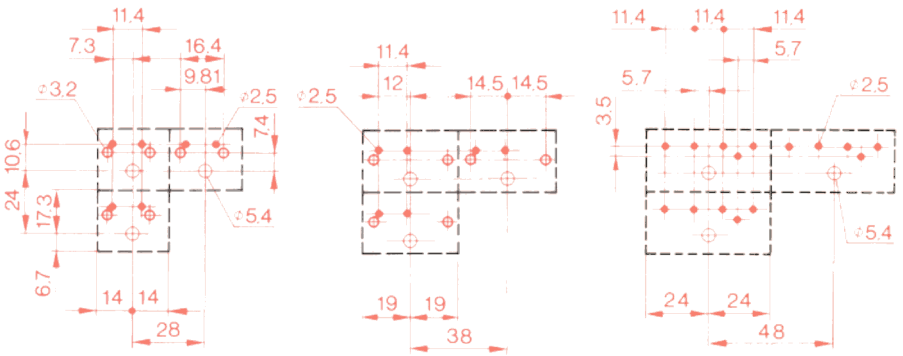
Panel cutout



Plug-in mounting on printed circuits



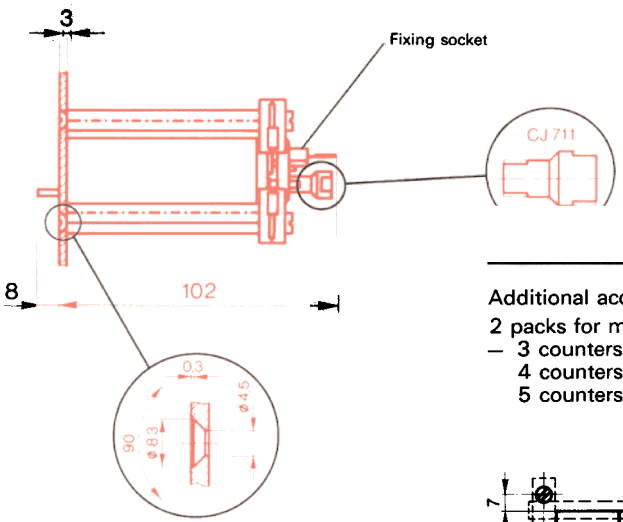
Drill plan for board

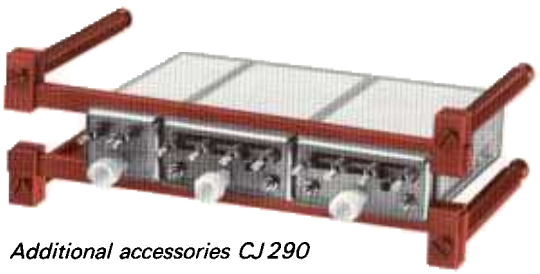


● electrical connections ○ fixing stud respectively fixing nut

Soldering lugs have to be ordered separately:
part number CJ 722

Flush mounting by means of fixing socket and additional accessories



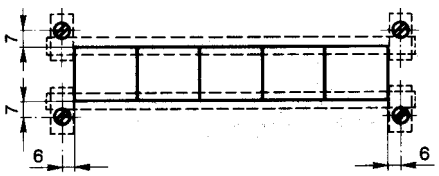


Additional accessories CJ 290

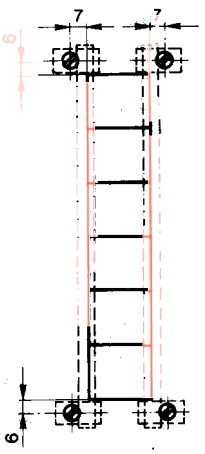
Additional accessories have to be ordered separately: part number CJ 290 (1 pack)

2 packs for mounting of

- 3 counters 24×48 mm side by side
  4 counters 24×38 mm side by side
  5 counters 24×28 mm side by side
- 6 counters 24×28 mm, 24×38 mm or 24×48 mm one above the other



Panel cutouts
24.5×143 mm (5 counters 24×28 mm)
24.5×155 mm (4 counters 24×38 mm)
24.5×147 mm (3 counters 24×48 mm)



Panel cutouts
149×28.5 mm
(6 counters 24×28 mm)
149×38.5 mm
(6 counters 24×38 mm)
149×48.5 mm
(6 counters 24×48 mm)

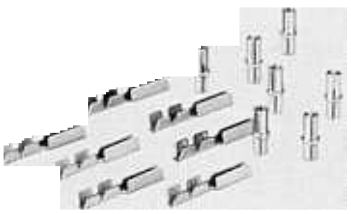
Fixing socket has to be ordered separately:

Part number CJ 202 for counters 24×28 mm
Part number CJ 203 for counters 24×38 mm
Part number CJ 204 for counters 24×48 mm, 4 pin
Part number CJ 205 for counters 24×48 mm, 5 pin

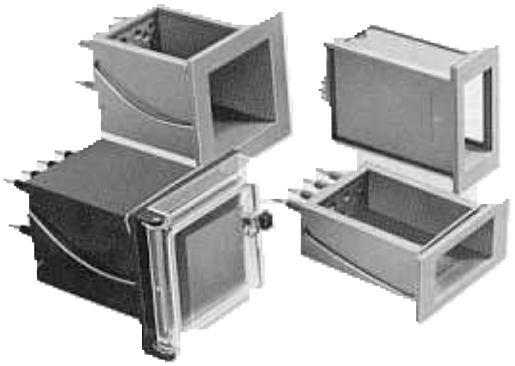
Connection by means of tags (2.8×0.8 mm) for push-on connectors or soldering

Review of accessories

The use of fixing sockets enables the counters to be prewired. All that is required during commissioning is for the counters to be plugged in and, where necessary, secured with fixing nuts. Connection is by means of tags for push-on connectors or soldering (exception: CRS soldered connection only).

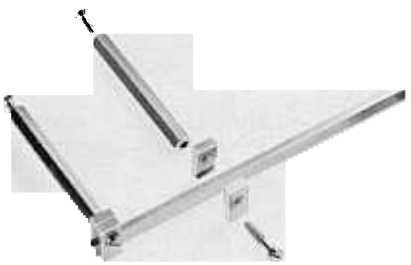


Two connection accessories: the separate terminals for soldering or for clamping and the soldering lugs for printed circuits (CRG/CRT only).



The fixing frames and protective case (IP65) for flush mounting in a panel has the same advantages as with the fixing socket.

The key for manually resetting the CRG/CRT (part number CJ701).



Additional accessories for flush mounting several counters, one above the other or side by side in the basic housing, connection via fixing socket.

Various adaptor frames are available for existing cutouts which are too large.