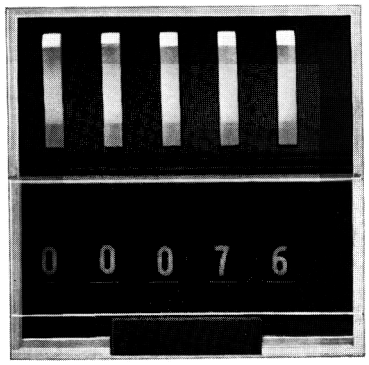
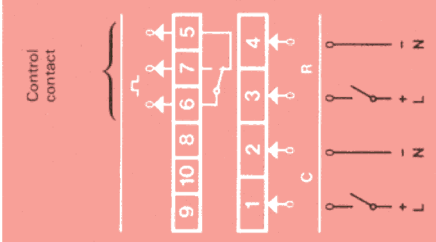


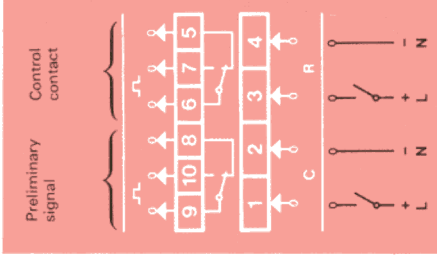
Electromechanical predetermining counter CRP

Connection diagrams

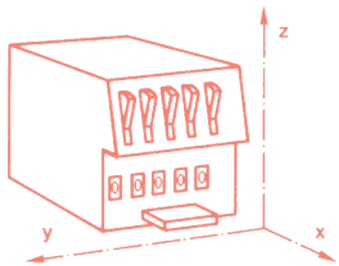
with control contact, manual and electrical reset



with control contact and preliminary signal, manual and electrical reset



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



General data

Count	
Counting capacity	99,999
Counting direction	
Counting frequency max.	20 i/s or 40 i/s (DC) 15 i/s (AC)
Value per impulse	1:1. Special: 2:1, 5:1
Display	Wheels; white figures on black background, 2×4 mm Special: with fixed decimal point .9, .99 with symbols, units, static zeros, etc. (on request) other figure colours (on request)
Predetermining	By pushbuttons (see page 16 'Operation' for details)
Preliminary signal	Without or with fixed preliminary signal: 20, 50, 200 or 500 impulses before zero
Reset	To preset value; manual, manual and electrical, or manual, electrical and automatic
Life expectancy	Count: 200 million impulses for the 20 i/s version 100 million impulses for the 40 i/s version Reset: 2 million electrical reset operations
Mounting	– flush mounting with clamping spring (including a set of separate 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) In any mounting position. See pages 22/23 'Dimensional drawings' for all details.
Connection	– by means of separate terminals for soldering or clamping – 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 22/23 'Dimensional drawings' for all details.
Ambient temperature	Operation: −10 °C to +50 °C
Climatic conditions	Climate type G according to DIN 40040
Vibration strength	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)	IP 40 according to DIN 40050 (IP 65 by means of protective case, see page 23)
. .	UL recognized (file nr. E53905, vol. 3, sec. 1)
	approx. 215 g with manual reset approx. 260 g with electrical reset approx. 275 g with automatic reset

Electrical data

Inputs (count and reset)

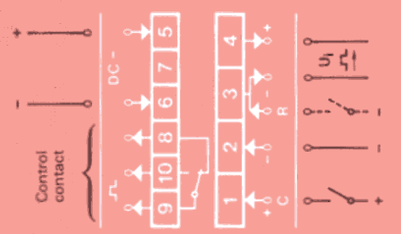
Supply voltage (U_N)	DC: 6V, 12V, **24V**[1]), 36V, 48V[1]), 60V, 110V[2]), 220V[2]) residual ripple max. 48%, voltage tolerance −15%/+10% AC: 24V[2]), 100...115V[2]), 220...240V[2]); 50/60 Hz voltage tolerance −15%/+10%

[1]) available with automatic reset, according to the connection diagram DC (see page 15)
[2]) available with automatic reset, according to the connection diagram AC (see page 15)

Connection diagrams

with control contact; with manual, electrical and automatic reset

DC (24 VDC, 48 VDC)



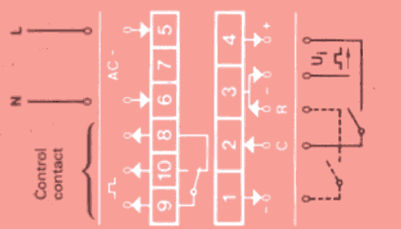
DC version

Count C: by means of voltage pulses

Electrical reset R: by a contact to –, provision of spark suppression imperative (see page 30)

Output voltage pulse U_i: connections 3 and 4

AC (even for 110 VDC, 220 VDC)

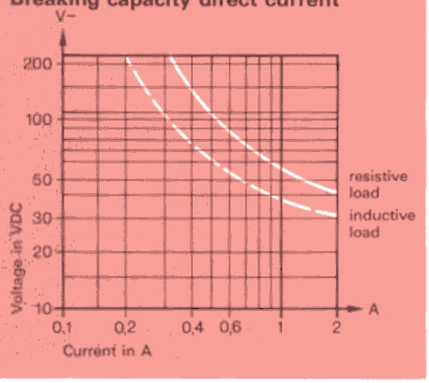


AC/DC version

Count C and electrical reset R: by potential-free contact, provision of spark suppression imperative (see page 30)

Output voltage pulse U_i: connections 3 and 4

Breaking capacity direct current



Power consumption	
Count	4 W for the versions 20 i/s, DC, without preliminary signal 7 W for the versions 20 i/s, DC, with preliminary signal and for 40 i/s versions 4 VA for the versions 15 i/s, AC, without preliminary signal 7 VA for the versions 15 i/s, AC, with preliminary signal
Reset	12 W (DC) respectively 12 VA (AC)
Impulse generator types	Contacts, electronic sensors PNP, NPN or for alternating current (see page 31 for SAIA® Proximity Switches)

Impulse data

	Count 20 i/s (DC)	40 i/s (DC)	15 i/s (AC)	Reset DC	AC
Impulse length	min. 23 ms	min. 14 ms	min. 30 ms	min. 150 ms	min. 200 ms
Impulse interval	min. 23 ms	min. 9 ms	min. 30 ms	min. 80 ms	min. 100 ms

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 and render the changeover of the output contact impossible at the end of the counting cycle. The unit wheel must be brought to its correct position by a reset operation under required conditions.

Duty cycle	
Count	100% for the versions without preliminary signal 60%, max. 5 min, for the versions with preliminary signal
Reset	25%, max. 1 min (100% duty cycle on request)
Insulation voltage	1.5 kVAC (6...48 V) respectively 2.5 kVAC (60...240 V) according to VDE 435

Coil resistance (DC)

Supply voltage	6 VDC	12 VDC	**24 VDC**	36 VDC	48 VDC	60 VDC	110 VDC	220 VDC
Count 20 i/s without preliminary signal	9.1 Ω	36 Ω	**150 Ω**	330 Ω	560 Ω	910 Ω	3000 Ω	12000 Ω
Count 20 i/s with preliminary signal and 40 i/s	4.7 Ω	20 Ω	82 Ω	180 Ω	330 Ω	510 Ω	1600 Ω	6800 Ω
Reset	3 Ω	12 Ω	**47 Ω**	100 Ω	180 Ω	300 Ω	1000 Ω	3900 Ω

Outputs

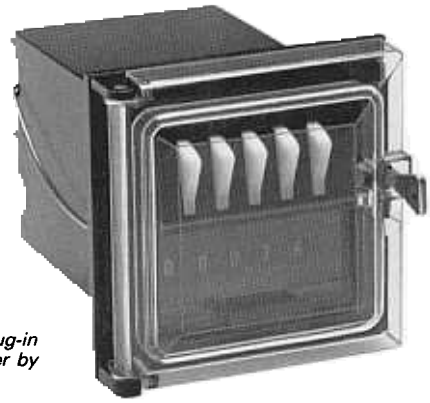
Type of outputs	Changeover contacts (snap-action switches) and voltage pulse (only with versions having automatic reset)

Important notes:

- Zero should not be preset when the counter is switched on (undefined control contact position respectively continuous reset operations with automatic reset)!
- It is possible for the changeover contacts (control contact and preliminary signal) to exhibit bounce amounting to a few ms; this must be taken into account when using in electronic circuits.

Changeover contacts (control contact and preliminary signal)

Breaking capacity		
Direct current:	see adjacent graph; max. current 2 A respectively 1 A with preliminary signal or automatic reset	
Alternating current:	2 A/250 VAC (AC 1, resistive load) 0.5 A/250 VAC (AC 11, inductive load) $P_{max.}$ (resistive) 500 VA	with manual and/or electrical reset
	1 A/250 VAC (AC 1, resistive load) 0.1 A/250 VAC (AC 11, inductive load) $P_{max.}$ (resistive) 250 VA	with preliminary signal or automatic reset
	according to VDE 0660, sections 1 and 2	

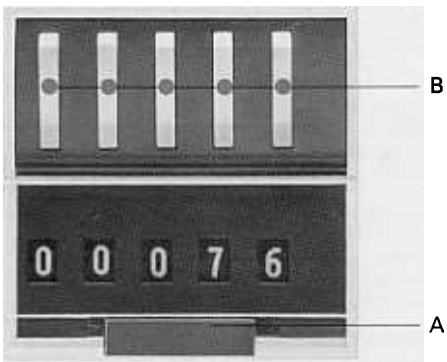


The protective case, class IP65 (front), for plug-in mounting; the rigid cover can be opened either by pushbutton or key.

Operation

The preset value is set as follows:

1. Push reset pushbutton A fully home; the previously set preset value appears.
2. Keep pushbutton A pressed in and set preset value by repeatedly pressing pushbuttons B.
3. Release pushbutton A. The counter is now ready for operation.



Important note:
Zero should not be preset when the counter is switched on (undefined control contact position respectively continuous reset operations with automatic reset)! If preset value zero is absolutely necessary, the counter must be switched off.

Delay times T

T1 Delay between negative edge of the counting impulse and operating position of the changeover contacts or voltage pulse

max. 10ms (DC) respectively 25ms (AC)

T2 Waiting period between negative edge of the counting impulse and the positive edge of the reset impulse

min. 23ms (20i/s), 9ms (40i/s) respectively 30ms (15i/s)

T3 Delay between positive edge of reset impulse and rest position of the changeover contacts

10...110ms according to preset value

T4 Waiting period between the negative edge of the reset impulse and the positive edge of the counting impulse

min. 80ms (DC) respectively 100ms (AC)

T5 Forced interruption of the count for the period of the automatic reset. Counting impulses arriving during this interruption are not taken into account and could impair the function (see also the note under 'Impulse Data', page 15)

min. 340ms (DC) respectively 375ms (AC)
max. counting frequency without impulse loss:
2.6i/s (DC) respectively 2.4i/s (AC)

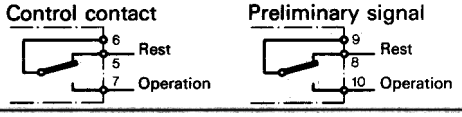
Outputs (continuation)

Life expectancy

mechanical: 50 million operations
electrical: 0.8 million operations at 1A/250VAC, resistive load
0.3 million operations at 2A/24VDC, resistive load

With an inductive load a spark suppression is imperative for protection of the contacts (see page 30)

Connection diagram



Voltage pulse (only with automatic reset)

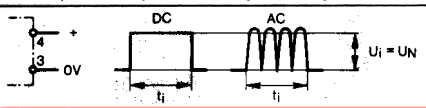
Impulse length t_i: 150...250ms

Notes:
- Impulse length on control contact at an automatic reset 10...100ms
- At each electrical reset a signal is also generated (impulse length corresponding to input signal)

Rating

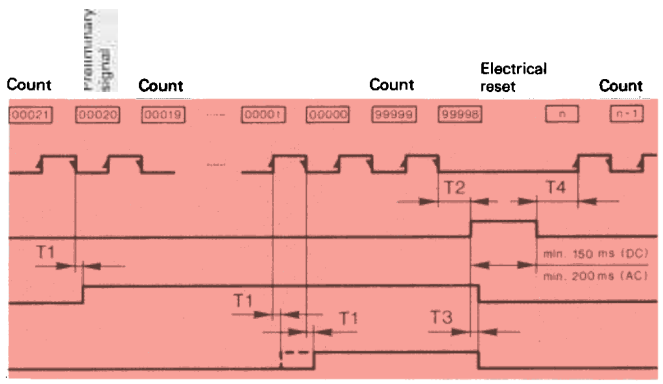
max. 1A, pulse voltage U_i equal supply voltage U_N,
$P_{max.}$ (resistive) 50W respectively 50VA

Connection diagram



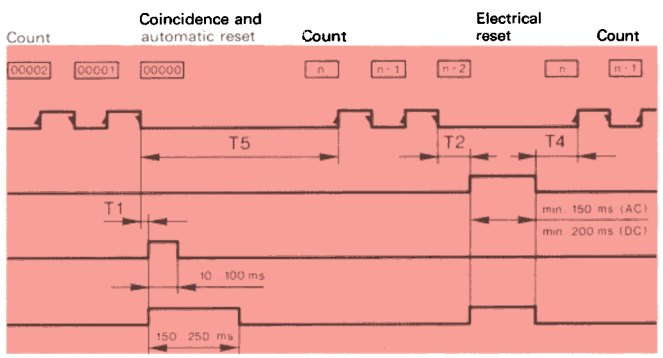
Function diagrams

With manual and electrical reset



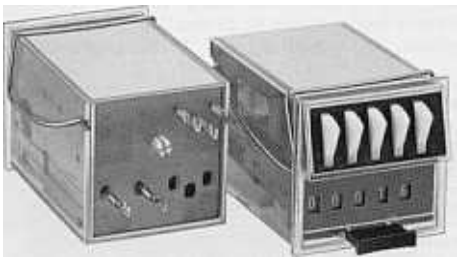
¹) Special: Control contact actioned at the start of the counting impulse (delay time T1: max. 22ms for 20i/s respectively 15ms for 40i/s)

With automatic, manual and electrical reset



Ordering details

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



Execution for flush mounting, complete with a clamping spring and a set of separate terminals for soldering or clamping.

Basic housing with fixing nut, the execution for different ways of mounting and connection, by means of appropriate accessories.

Reset	Preliminary signal	Flush mounting[1]	Basic housing[2]
manual	without preliminary signal with preliminary signal[3]	**CRP 112** CRP 122	CRP 111 CRP 121
manual and electrical	without preliminary signal with preliminary signal[3]	**CRP 312** CRP 322	CRP 311 CRP 321
manual, electrical and automatic	without preliminary signal[3] [4]	**CRP 512**	CRP 511

[1] complete with clamping spring and separate terminals
[2] with fixing nut, without accessories for mounting and connection
[3] only possible for the versions 20 i/s (DC) and 15 i/s (AC)
[4] only possible for 24 VDC, 48 VDC and 24 VAC, 100...115 VAC, 220...240 VAC

Supply voltage

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

N without preliminary signal

F	with preliminary signal 20 impulses before zero
G	with preliminary signal 50 impulses before zero
J	with preliminary signal 200 impulses before zero
K	with preliminary signal 500 impulses before zero
P	Control contact actioned at the start of the counting impulse[1]

[1] only possible for CRP 11... and CRP 31...

Counting frequency max.

2	**20 i/s (DC)** respectively 15 i/s (AC)
3	40 i/s (DC)[1]

[1] only possible without preliminary signal and without automatic reset

Value per impulse

N	**1:1**	P	2:1[1]
		S	5:1[1]

[1] only possible without preliminary signal

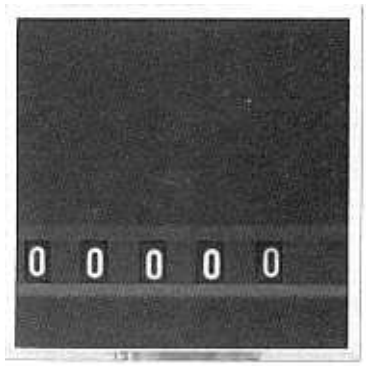
0	**without decimal point**	1	with decimal point .9
		2	with decimal point .99

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

Note:
- The bold typeface denotes the standard versions.
- Accessories for mounting and connection to the basic housing have to be ordered separately, see pages 22/23 '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.

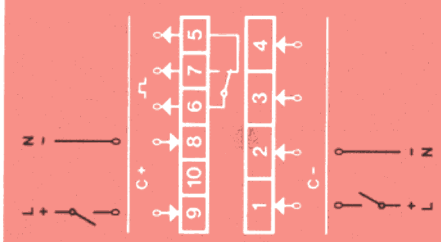
Example: Electromechanical predetermining counter CRP 322 with preliminary signal 200 impulses before zero, 24 VDC, max. 20 i/s, value per impulse 2:1 or CRP 322 M4 J2P0 N



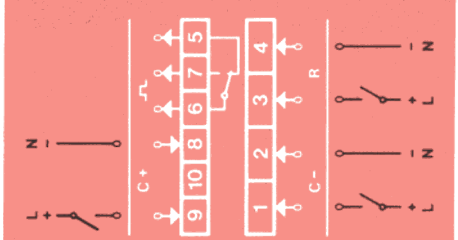
Electromechanical differential counters CRR

Connection diagrams

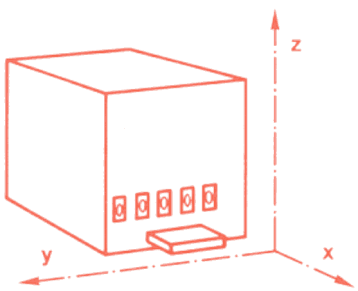
non-reset or with manual reset and control contact



with electrical reset and control contact



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



General data

Count	
Counting capacity	99,999
Counting direction	up and down
Counting frequency max.	10i/s or 20i/s
Value per impulse	1:1. Special: 2:1, 5:1
Display	Wheels; white figures on black background, 2×4mm Special: with fixed decimal point .9, .99
Control contact	Without or with control contact, actioned when counting value reaches zero
Reset	To zero; none, manual, electrical, or combined manual and electrical
Life expectancy	
Count:	50 million impulses per driving mechanism for the version 10i/s 25 million impulses per driving mechanism for the version 20i/s
Reset:	1 million electrical reset operations
Mounting	– flush mounting with clamping spring (including a set of separate 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) In any mounting position. See pages 22/23 'Dimensional drawings' for all details.
Connection	– by means of separate terminals for soldering or clamping – by means of tags (2.8×0.8mm) for push-on connectors or soldering; on the fixing socket, fixing frame and protective case See pages 22/23 'Dimensional drawings' for all details.
Ambient temperature	Operation: −10 °C to +50 °C
Climatic conditions	Climate type G according to DIN 40040
Vibration strength	Operational reliability: 5g at axes y and z, 2g at axis x, according to IEC 68-2-6, test FC in 3 planes at 10...500Hz
Protection class (front)	According to DIN 40050: IP65 for versions without button, IP40 for versions with button (IP65 by means of protective case, see page 23)
Weight	approx. 235 g non-reset or with manual reset approx. 290 g with electrical reset

Electrical data

Inputs (count and reset)

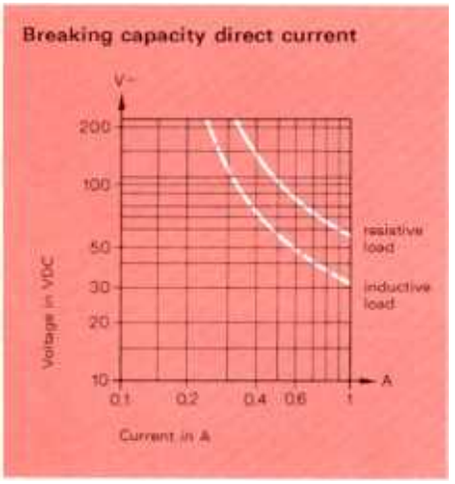
Supply voltage (U_N)	DC: 6V, 12V, **24V**, 36V, 48V, 60V, 110V, 220V residual ripple max. 48%; voltage tolerance −15%/+10% AC: on request (counting frequency max. 10i/s)
Power consumption	Count: 4W for the version 10i/s, 7W for the version 20i/s Reset: 7W
Impulse generator types	Contacts, electronic sensors NPN/PNP (see page 31 for SAIA®Proximity Switches)

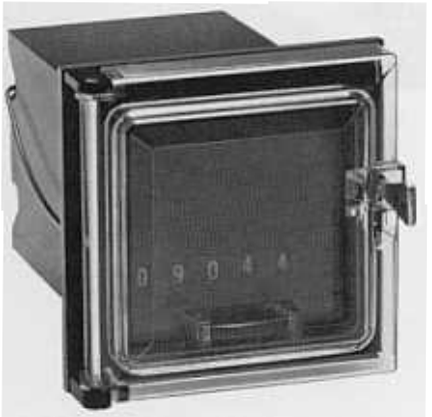
Impulse data

	Count 10i/s	20i/s	Reset
Impulse length	min. 40ms	min. 23ms	min. 150ms
Impulse interval	min. 40ms	min. 23ms	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.

CRR





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

Duty cycle	Count: 100% for the version 10i/s 60%, max. 5min, for the version 20i/s Reset: 60%, max. 5min
Insulation voltage	1.5kV (6...48V) respectively 2.5kV (60...220V) according to VDE435

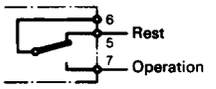
Coil resistance

Supply voltage	6VDC	12VDC	**24VDC**	36VDC	48VDC	60VDC	110VDC	220VDC
Count 10i/s	9.1Ω	36Ω	**150Ω**	330Ω	560Ω	910Ω	3000Ω	12000Ω
Count 20i/s and reset	4.7Ω	20Ω	**82Ω**	180Ω	330Ω	510Ω	1600Ω	6800Ω

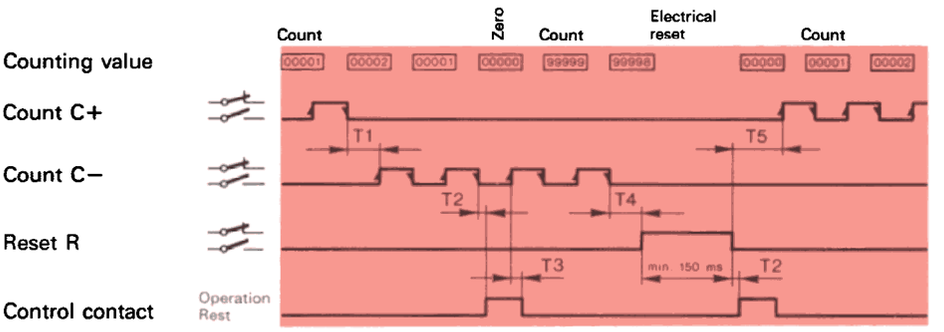
Outputs

Type of output	Changeover contact (snap-action switch) as control contact, only possible for the version 10i/s
Breaking capacity	Direct current: see adjacent graph; max. current 1A Alternating current: 1A/250VAC (AC1, resistive load) 0.1A/250VAC (AC11, inductive load) $P_{max.}$ (resistive) 250VA according to VDE0660, 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



Function diagram



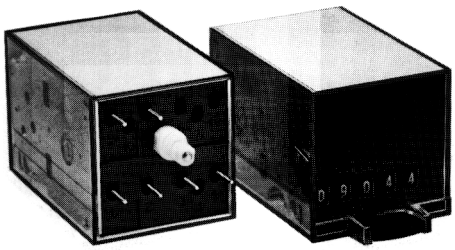
Delay times T

T1	Waiting period for changing the counting direction	min. 40ms for 10i/s, min. 17ms for 20i/s
T2	Delay between negative edge of the counting impulse and operating position of the control contact	max. 12ms
T3	Delay between positive edge of the counting impulse and rest position of the control contact	12...30ms
T4	Waiting period between negative edge of the counting impulse and positive edge of the reset impulse	min. 40ms for 10i/s, min. 17ms for 20i/s
T5	Waiting period between negative edge of the reset impulse and positive edge of the counting impulse	min. 100ms

CRR

Ordering details

Execution for flush mounting, complete with a clamping spring and a set of separate terminals for soldering or clamping.



Basic housing with fixing nut, the execution for different ways of mounting and connection, by means of appropriate accessories.

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
C	R	R		5								N

Type of reset

0 none
1 manual
2 electrical
3 manual and electrical

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
7 Basic housing without button[1])

[1]) Only possible for versions with no reset or with electrical reset (button used for withdrawing counter in plug-in mounting)

Supply voltage

L6	6VDC	N1	48VDC
M1	12VDC	N2	60VDC
M4	**24VDC**	N8	110VDC
M6	36VDC	P4	220VDC

A without control contact
W with control contact
(only possible for the version 10i/s)

Counting frequency max.

1 10i/s
2 20i/s (only possible without control contact)

Value per impulse

N 1:1
P 2:1
S 5:1

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

Note:
- The bold typeface denotes the standard versions.
- Accessories for mounting and connection to the basic housing have to be ordered separately, see pages 22/23 'Dimensional drawings' for all details.
- Other special versions on request.

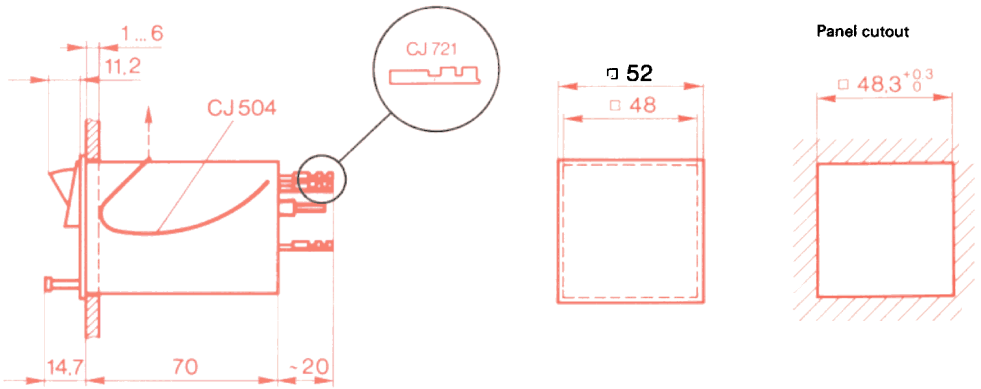
Ordering can be by means of the above ASN-code or by product description.

Example: Electromechanical differential counter CRR
Basic housing, without reset, 220VDC, without control contact, counting frequency max. 20i/s
or CRR 051 P4 A2N0 N
in addition e.g. part number CJ210 (fixing socket)

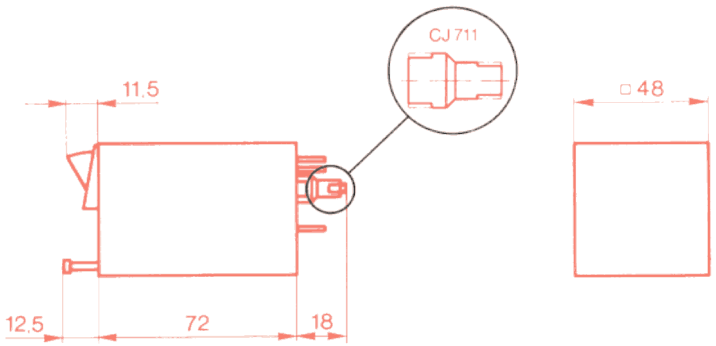
Dimensional drawings CRP / CRR

Flush mounting
by means of clamping spring

(complete with clamping spring CJ 504 and separate terminals CJ 721)



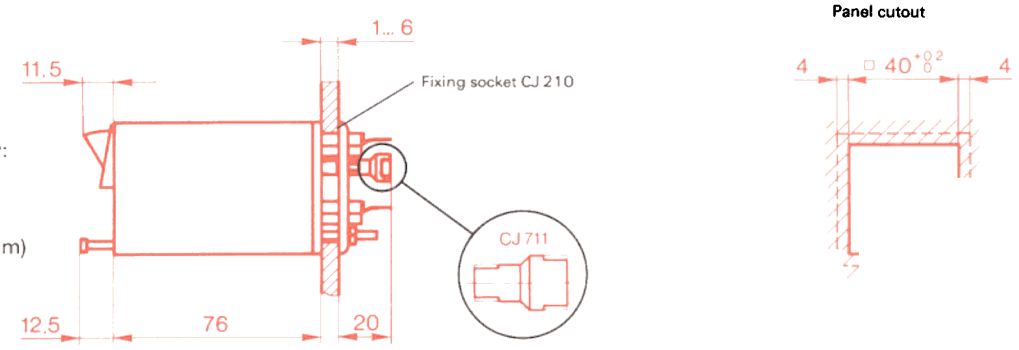
Dimension of the basic housing
(including fixing nut CJ 711)

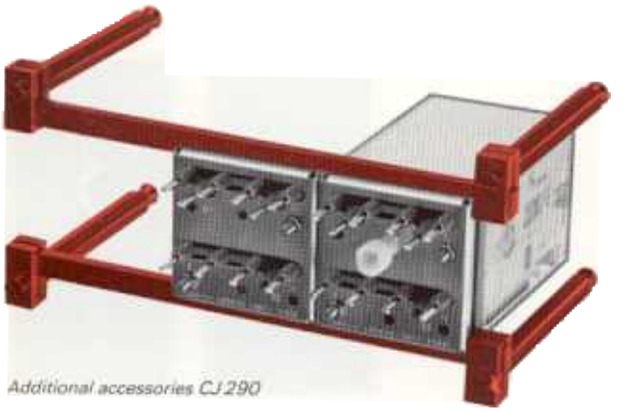


Surface mounting
by means of fixing socket

Fixing socket has to be ordered separately: part number CJ 210

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

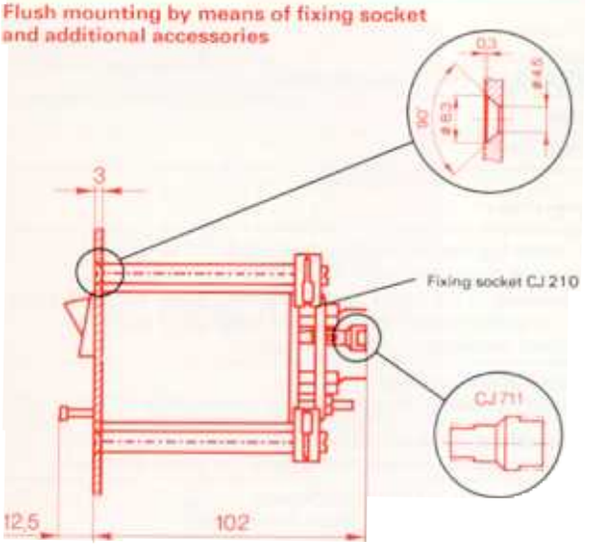




Additional accessories CJ 290

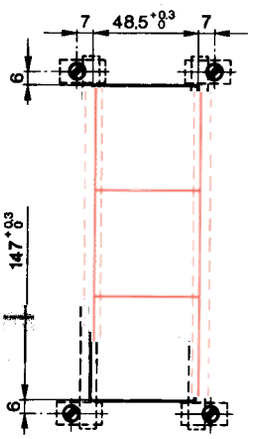
CRP
CRR

Flush mounting by means of fixing socket and additional accessories



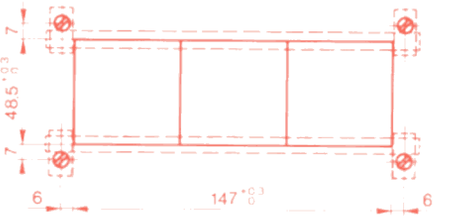
Fixing socket has to be ordered separately:
part number CJ 210

Panel cutouts



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

2 packs for mounting of 3 CRP/CRR one above the other or side by side



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

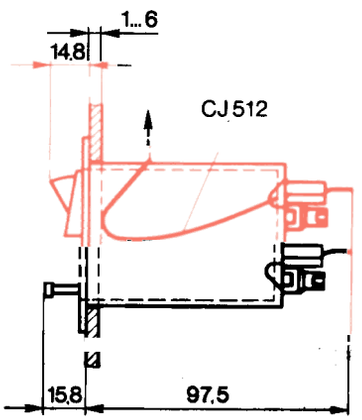
Fixing by means of clamping spring

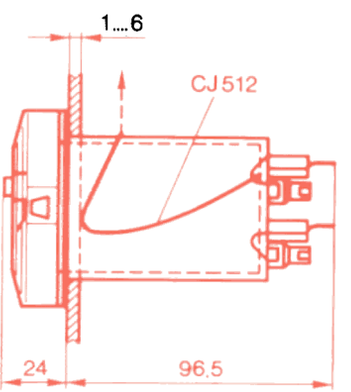
Fixing frame has to be ordered separately:
part number CJ 110

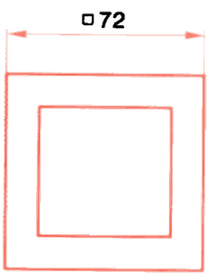
Flush mounting, plug-in by means of protective case

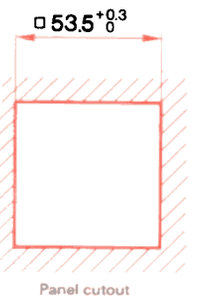
- Protection class (front): IP 65 according to DIN 40050
- The transparent, rigid cover can be opened either by pushbutton or key
- Fixing by means of clamping spring

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









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