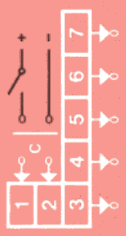
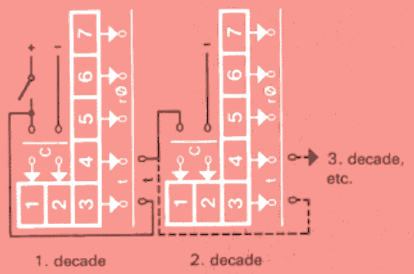
Electromechanical single-decade counter units CRS

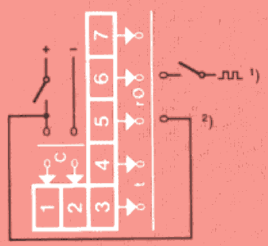
Connection diagram for counting



Connection diagram for transfer (t)



Connection diagram for reset (rØ)

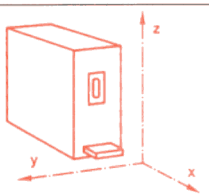


[1]) Train of impulses (min. 9 impulses) by preference on DC at the nominal voltage
Other possibilities: AC voltage equal to twice the nominal voltage, rectified with a diode, for at least 200 ms at 50 Hz

[2]) Terminals no. 4/5 at versions with all type of outputs (t, rØ and read-out)

General data

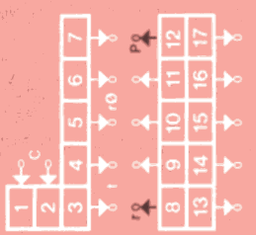
Count	
Counting capacity	9 (...999,999 i.e. max. 6 counter units)
Counting direction	up or down
Counting frequency max.	25 i/s
Value per impulse	1:1 Special: 2:1, 5:1
Display	Wheels; white figures on black background, 5×10 mm for counting value respectively 2×4 mm for preset value A small opening in the upper part of the front panel serves to show if the unit is under voltage or not (white rectangle = not under voltage; black rectangle = under voltage)
Preselection	without or with preselection (by repeatedly pressing the pushbutton, preset value is set)
Read-out	without or with read-out contacts, decimal coded (this allows electrical transmission of counter value or preliminary signal)
Reset	to zero; electrical by a train of impulses (see 'Connection diagram for reset' for details)
Life expectancy	25 million counting impulses
	– flush mounting with clamping spring (including separate terminals respectively fixing socket) – 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) In any mounting position. See pages 28/29 'Dimensional drawings' for all details
Connection	– by means of separate terminals for soldering or clamping (delivered with totalizing version without outputs) – by means of soldering terminals, on the fixing socket and fixing frame[1]) See pages 28/29 'Dimensional drawings' for all details [1]) Special: Soldering terminals with gold surface coating for low loads: U<10 V or I<10 mA
Ambient temperature	Operation: −10 °C to +50 °C
	Climate type G according to DIN 40040
	Operation reliability: 5 g at axes x and y, 3 g at axis z, 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
Weight	approx. 150 g (fixing socket approx. 30 g, fixing frame approx. 90 g)



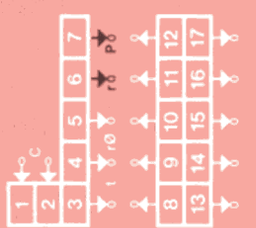
CRS

Connection diagram for preselection contact (P)

Versions without read-out contacts



Versions with read-out contacts



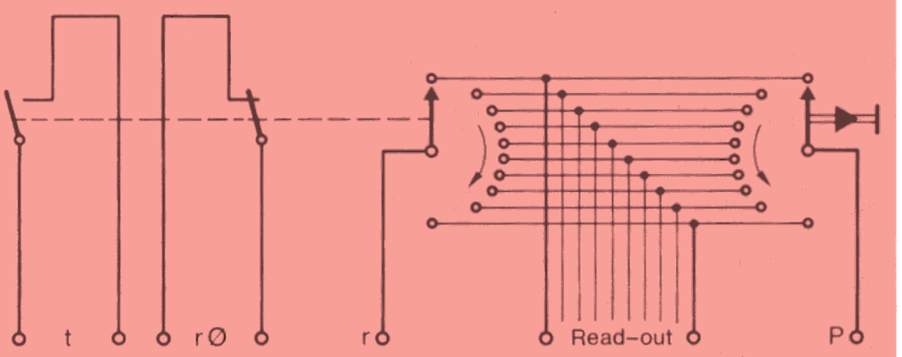
Electrical data

Inputs (count)

Supply voltage (U_N)	DC: 12V, **24V**, 48V residual ripple max. 48%; voltage tolerance ±10%
Power consumption	2W for versions without outputs 3W for versions with reset and transfer contacts 4W for versions with all type of outputs (preselection, read-out)
Impulse generator types	Contacts, electronic sensors NPN/PNP (see page 31 for SAIA®Proximity Switches) The impulse generator is protected by a zinc-oxyde resistor (ZNR) in the counter unit CRS, i.e. external spark suppression is unnecessary. (A superfluous diode spark suppression would even reduce the max. counting frequency to 10i/s.)
Impulse data	Impulse length min. 27ms Impulse interval min. 9ms
Duty cycle	100% for versions without outputs or with reset and transfer contacts 75%, max. 5min, for versions with all type of outputs (preselection, read-out)
Insulation voltage	1.5kV according to VDE435

Supply voltage	12VDC	**24VDC**	48VDC
	82Ω	330Ω	
	47Ω	**180Ω**	
		150Ω	

Schematic diagram of the outputs



Connection for read-out contacts

Terminal no.	8	9	10	11	12	13	14	15	16	17	Value per impulse, counting direction
Counting value	1 9	2 8	3 7	4 6	5 5	6 4	7 3	8 2	9 1	0 0	1:1, counting up 1:1, counting down
	2 8	4 6	6 4	8 2	0 0						2:1, counting up 2:1, counting down
	5	0									5:1

Preselection counter with basic housing, fixing frame with bracket for plug-in mounting, connection by means of soldering terminals

Wiring diagrams for the most used functions with these contacts

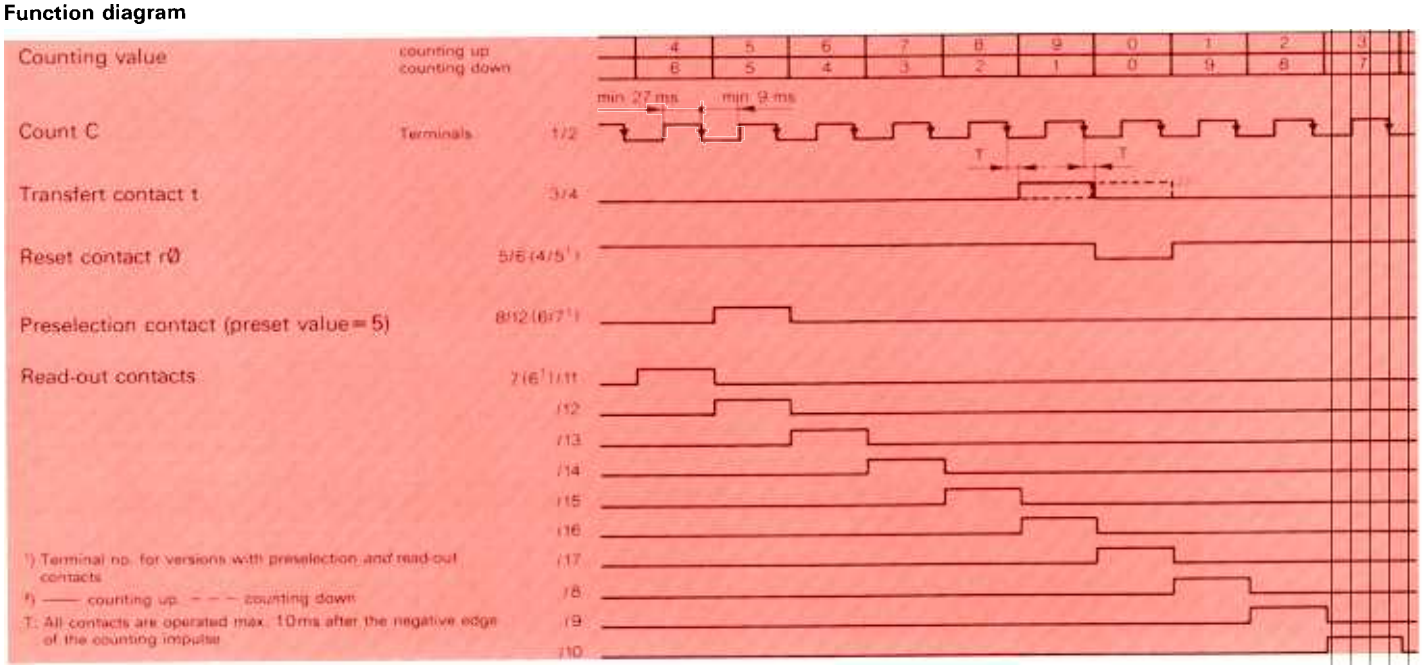
- preselection counter with preliminary signal
- preselection counter with automatic reset
- preselection counter with preliminary signal and automatic reset
- alternate counting with two preselection counter including automatic resets
- multiplication of an impulse

are summarized in a separate brochure, which is available on request.

Outputs

Function of outputs	– Transfer contact t: Transmits the counting impulse 'zero' to the next decade(s), allowing up to 6 CRS to be cascaded. – Reset contact rØ: A train of min. 9 impulses effects a zero reset. The impulses are taken to the counter coil via the closed contact; the contact opens as soon zero is reached. – Preselection contact P: Coincidence output (operating position as long as counter value equals preset value). – Read-out contacts: Allows electrical transmission of counter value or preliminary signal (decimal coded, i.e. each position of the figure wheel is provided with a contact).
Type of outputs	Wiper contacts, directly operated by the figure wheel **Note:** It is possible for the contacts to exhibit bounce amounting to a few ms; this must be taken into account when using in electronic circuits.
Switching capacity	Voltage: 5...60 VDC Current: 5...100 mA $P_{max.}$: 6 W for reset and transfer contacts 2 W for preselection and read-out contacts Insulation resistance: min. 100 MΩ for open contact, max. 10 Ω for closed contact With an inductive load a spark suppression is imperative for protection of the contacts (see page 30).
Continuous current	max. 1 A (i.e. at least 5 further counter units can be cascaded via the transfer contact)

Function diagram



CRS

Ordering details

Preselection counter for flush mounting, complete with clamping spring and fixing socket, connection by means of soldering terminals

Totalizing counter with basic housing, button used for withdrawing the counter from plug-in mounting (also available without button, thereby protection class IP65)

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

Counting direction
- **0 up**
- **1 down**

- **0 Totalizing counter**
- **1 Preselection counter**

Type of mounting and housing
- **2 Flush mounting**
  complete with clamping spring and separate terminals respectively fixing socket
- 1 Basic housing with fixing nut, without accessories for mounting and connection
- 5 Basic housing without button[1])

[1]) for totalizing counters only (front thereby protection class IP65)

Supply voltage
- M1 12VDC
- **M4 24VDC**
- N1 48VDC

Outputs
- A without outputs (for totalizing counters only)
- **S with transfer (t) and reset (rØ) contacts**
- **U with transfer (t), reset (rØ) and read-out contacts**

Value per impulse
- **N 1:1**
- P 2:1
- S 5:1

Note:
- — The bold typeface denotes the standard versions.
- — Accessories for mounting and connection to the basic housing have to be ordered separately, see pages 28/29 'Dimensional drawings' for all details.

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

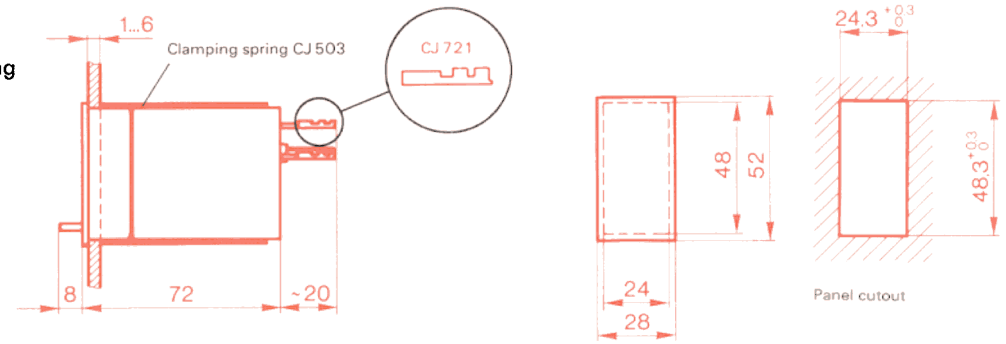
Example: Single-decade counter unit CRS
Preselection counter, counting down, basic housing, 24VDC, with transfer and reset contacts or
CRS111 M4 S0N0 N
in addition e.g. fixing frame, 8 terminals, CJ122

Dimensional drawings CRS

Flush mounting
by means of clamping spring

(complete with clamping spring, separate terminals respectively fixing socket and fixing nut)

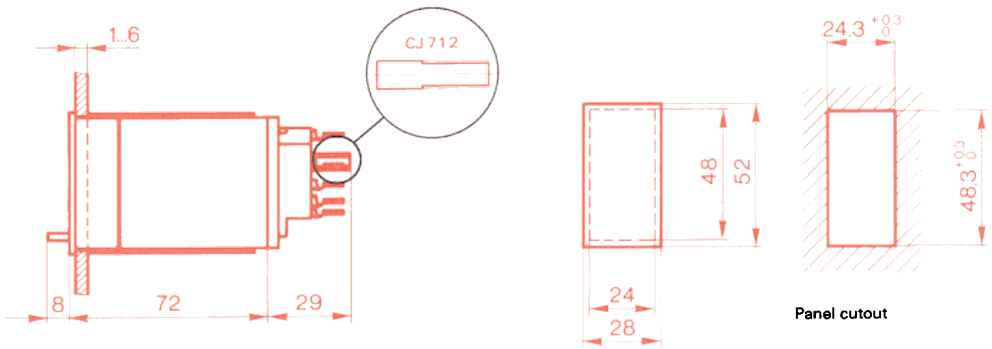
Versions without outputs:
separate terminals CJ 721



Versions without read-out contacts:
fixing socket CJ 232 (8pins)

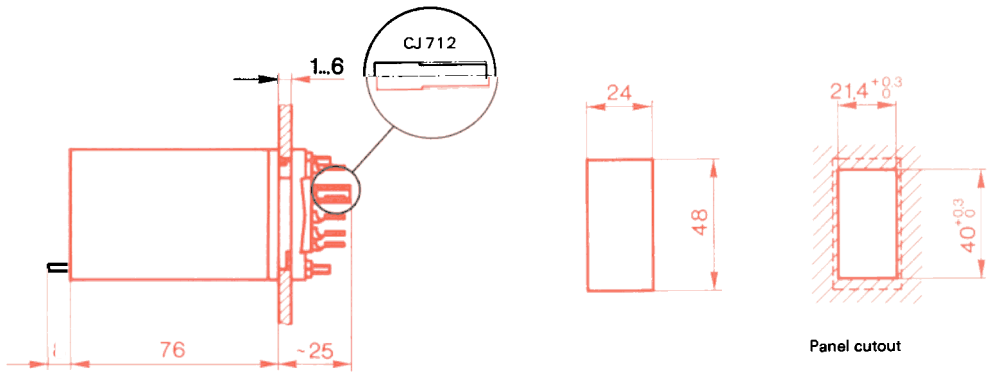
Versions with all outputs:
fixing socket CJ 234 (17pins)

Connection by means of soldering terminals



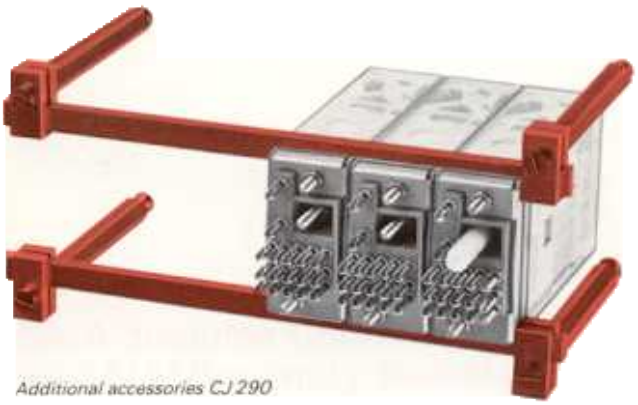
Surface mounting
by means of fixing socket

(basic housing with fixing nut CJ 712)



Fixing socket has to be ordered separately:

Version	Terminals and part number
without read-out contacts (8pins)	
with all outputs (17pins)	

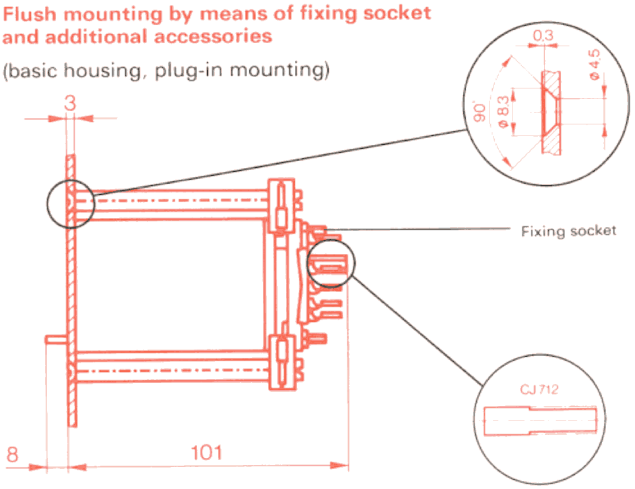


Additional accessories CJ 290

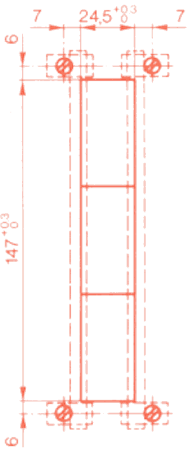
CRS

Flush mounting by means of fixing socket and additional accessories

(basic housing, plug-in mounting)



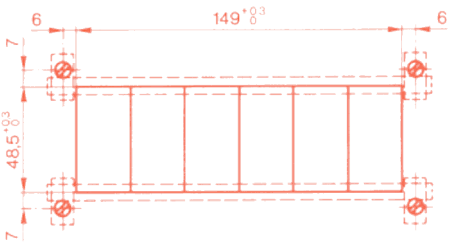
Fixing socket has to be ordered separately:
part number see page 28



Panel cutouts

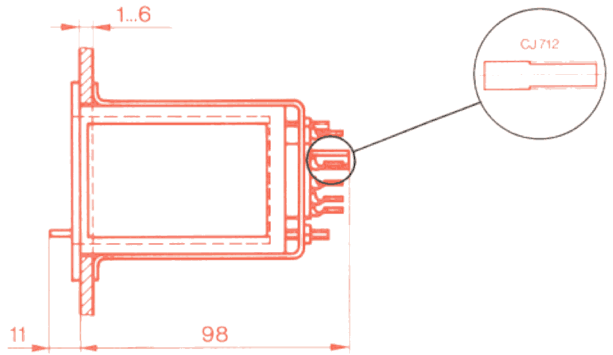
Additional accessories have to be ordered separately:
part number CJ 290 (1 pack)

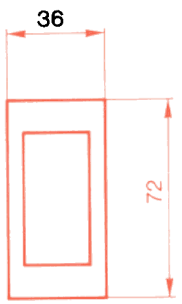
2 packs for mounting of
6 CRS side by side or
3 CRS one above the other



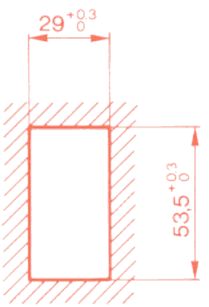
Flush mounting, plug-in by means of fixing frame

(basic housing, fixing with bracket)





Panel cutout



Fixing frame has to be ordered separately:

Version	Terminals and part number
without read-out contacts (8pins)	
with all outputs (17pins)	