SC-130

Liquid Level Control Module

SLIMLINE
MONITORING RELAYS

ORDERING CODE

TYPE	MODEL	VOLTAGE	POWER SUPPLY	RELAY CONTACTS
SC	130	230V	AC	SP

SEE PAGE 94 FOR ORDERING OPTIONS

Application Examples

- Level control of conductive liquids.
- Borehole pump control.
- Filling and draining of tanks and reservoirs.
- Control of sewerage pumps.
- Dosing of liquids chemicals or fertilisers.
- 2-wire remote stop-start control over extended distances.
- Monitoring and controlling of processes in conjunction with Light Dependent Resistors (LDR)

Features

- Failsafe feature.
- Programmable for charging and discharging operation.
- AC modulation of probe signal to prevent plating and electrolytic corrosion.
- Low voltage probe signal for human safety.
- Adjustable sensitivity.
- DC or AC power supply option.
- 10A SPDT relay output.

Description of Operation

The **SC-130** is a level control unit for conductive liquids. In conjunction with three conductive probes (e.g. CP-1C, CP-2C or CP-3C) it controls the level of the liquid in a reservoir between a high and a low level. It is programmable for failsafe operation in the following modes.

Charging (Filling) Reservoirs: When the level in the reservoirs drops below the low level probe, the relay energises. The relay then remains energised until the level reaches the high level probe. As soon as the high level probe becomes submerged, the relay de-energises and remains off until the level has dropped sufficiently to clear the low level probe.

Discharging (Draining) of Reservoirs: When the level in the reservoir rises sufficiently to submerge the high level probe, the relay energises. The relay the remains energised until the level has dropped below the low level probe. As the liquid clears the low level probe, the relay de-energises and remains off until the level has risen sufficiently to submerge the high level probe.

Sensitivity Adjustment: Sensitivity of the unit is adjustable to cater for

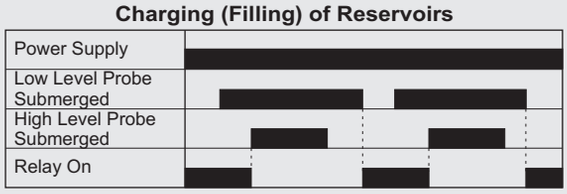
- Line impedance of long distance wiring between the probes and the unit,
- the conductivity of the liquids and
- unwanted matter, such as foam.

Choice of Probes: Any metal may serve as a probe. However, factors such as corrosion resistance, physical arrangement and the probability of erratic sensing of foam or condensation between probes, should be considered.

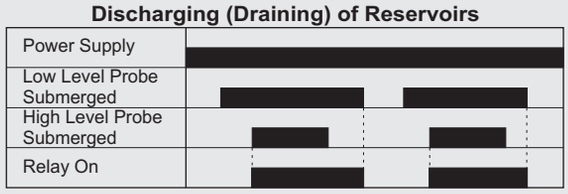
For optimum performance and ease of installation, the use of covered stainless steel probes (type CP-3C) is recommended. The length of probes may be shortened by cutting the probe to the required length or lengthened by using the extension rods (type EP-1C) and distance discs (type DD-3).

Operational Diagrams

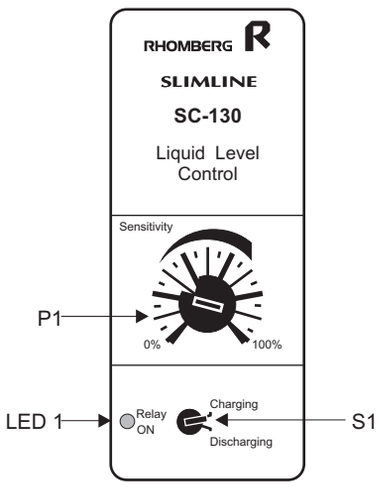
Charging (Filling) of Reservoirs



Discharging (Draining) of Reservoirs



Description of Controls



P1: The **Sensitivity** of the liquid sensing input is adjusted on P1. Turning P1 clockwise increases sensitivity.

S1: The **Mode of Operation** is selected on S1. If set to “charging” the unit provides failsafe filling of reservoirs. If set to “discharging” the unit provides failsafe draining of reservoirs.

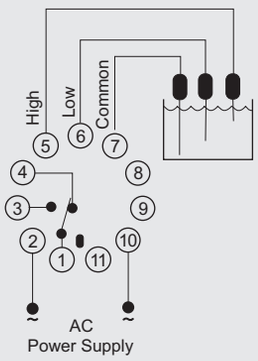
LED 1: The LED marked **“Relay On”** illuminates when the relay is energised.

Wiring and Connection

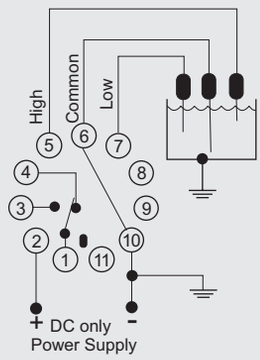
Power Supply	
Phase/ Positive	2
Neutral/ Negative	10

Relay contacts	
Normally open	1+3
Normally closed	1+4

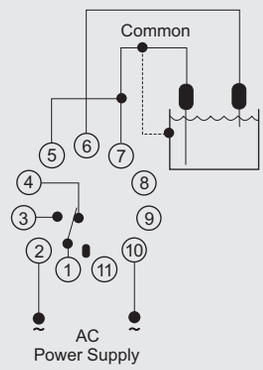
Level Probes	
Common probe	Pin 7
Low level probe	Pin 6
High level probe	Pin 5



APPLICATION 1
Connection of three probe (CP-3C)



APPLICATION 2
Connection of three probe (CP-3C) for DC applications.



APPLICATION 3
Single level control

Important: *In DC power supply applications pin 6 will be COMMON and pin 7 will be LOW. (Application 2)*

Technical Specifications

POWER SUPPLY

AC: Supply voltage: 12, 24, 110, 230, 400, 415, 525V ±15%
Isolation (probe input to power supply): 2kV
Power consumption: 3VA (approx.)
6VA for 415, 525V (approx.)

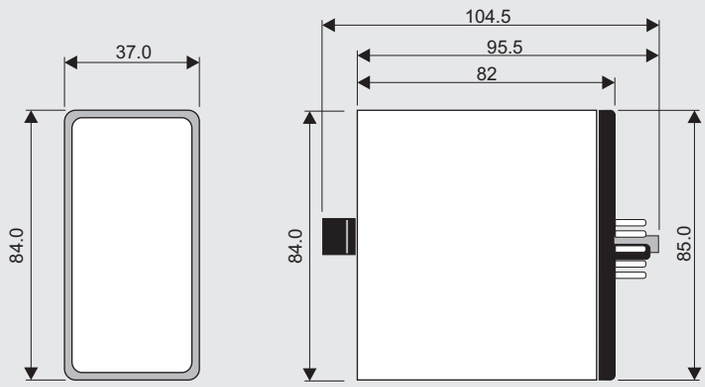
DC: Supply voltage: 10-30V, 48, 60, 110V ±15%
Isolation: no galvanic isolation
Power consumption: 100mA (10-30V), 30mA for higher ranges

LEVEL SENSING INPUT

Probe voltage: 4V AC.
Probe frequency: 100Hz.
Sensitivity: 0 to 50kOhm (adjustable).
Response time: 0,5 seconds.

Additional information in Section J, page 131.

Slimline

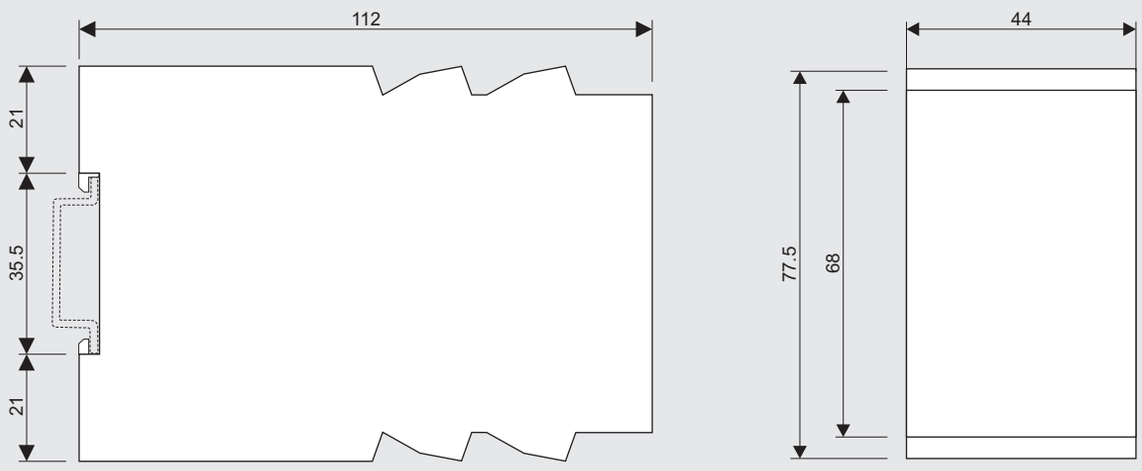


FRONT VIEW

SIDE VIEW

Housing colour: Base: Grey
Cover: Blue
Housing material: Polycarbonate

A-Line & Protechtor

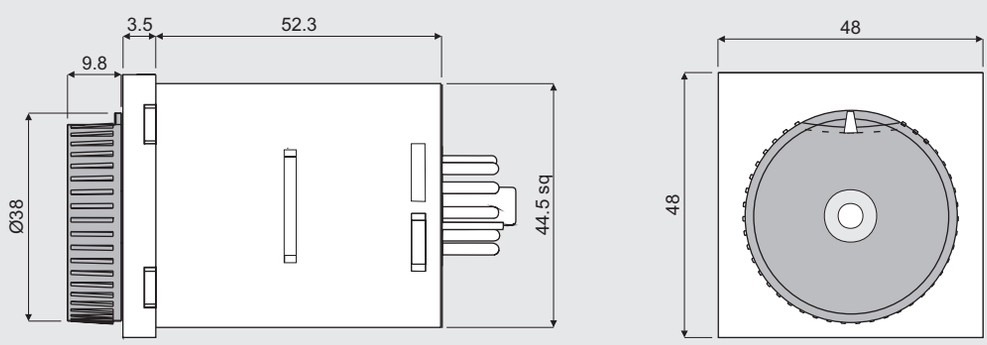


SIDE VIEW

FRONT VIEW

Housing colour: Beige
Housing material: Nylon 66

48 x 48 Timers



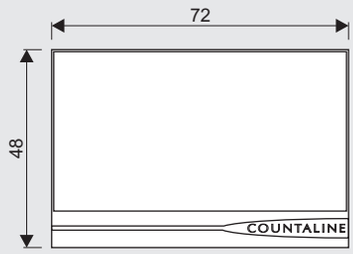
Side View

Front View

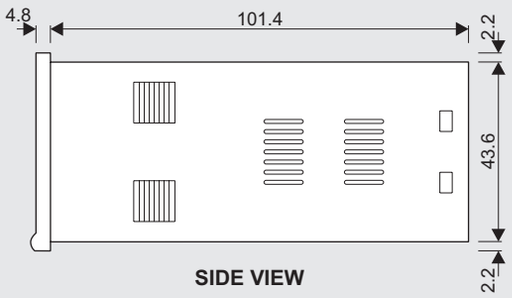
Housing colour: Beige
Housing material: ABS/ Polycarbonate

Countaline

CC-120



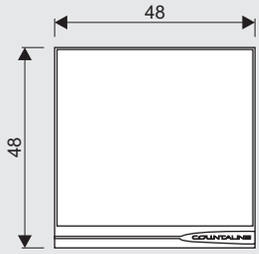
FRONT VIEW



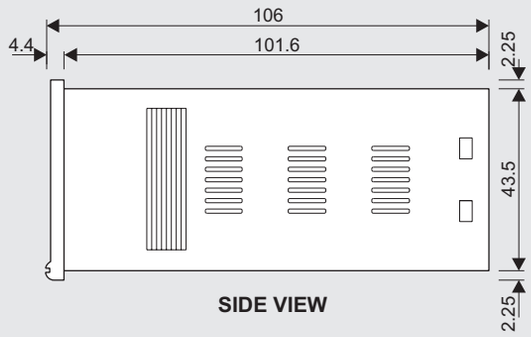
SIDE VIEW

TOP VIEW

CC-701



FRONT VIEW



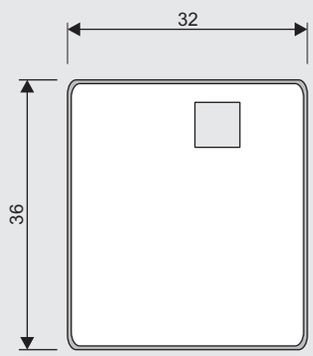
SIDE VIEW

TOP VIEW

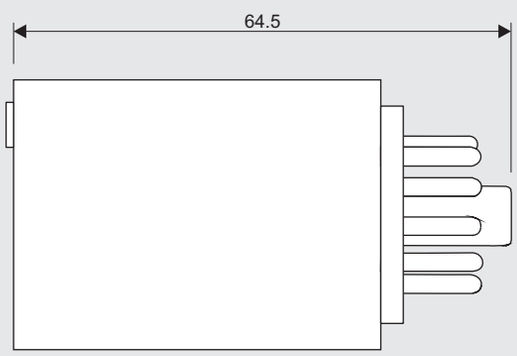
Note: *For the SC-700 dimensional diagram see Slimline dimensional Diagram on page 132.*

Housing colour: Charcoal
Housing material: ABS/ Polycarbonate

Industrial Relays



Front View



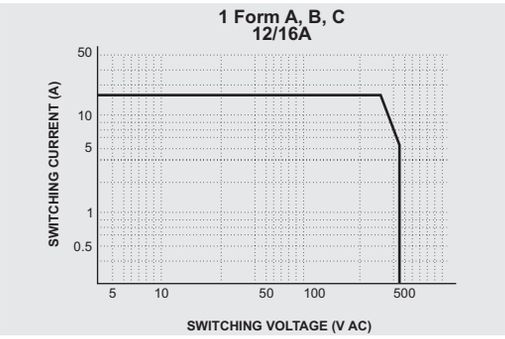
Side View

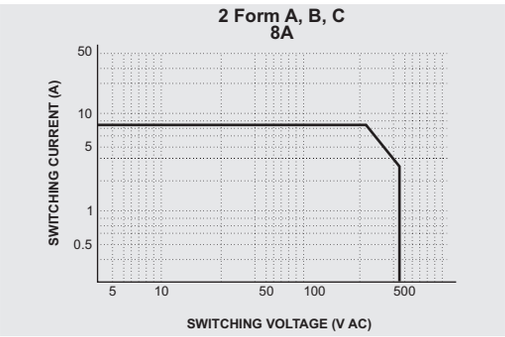
Housing colour: Clear
Housing material: ABS/ Polycarbonate

Technical Information

Ambient Temperature:	Storage: -50ºC to +85ºC Operating: -20ºC to +50ºC
Maximum ripple on DC power supply:	10%
AC supply frequency:	40 - 70Hz
Protection class:	IP40, IEC144, DIN 40050
Creepage distance:	VDE 0110 (group C 250V), NFC 20040 IEC 158.1
Isolation group:	VDE 0435
Note:	*Modules with power supply voltages exceeding 250V do not comply with the above standards.*

Relay Specifications



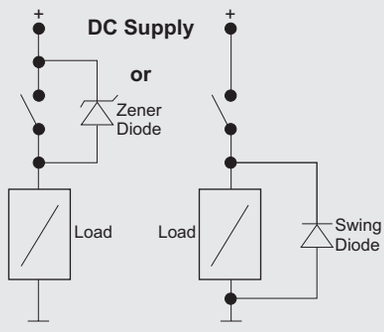


Contact Rating	**SPDT**	**DPDT**
Rated Load:	12A	8A
Max. Switching current:	12A	8A
Max. Switching voltage:	440A AC/125V DC	440A AC/125V DC
Max. Switching Power:	3000VA/4000VA	2000VA

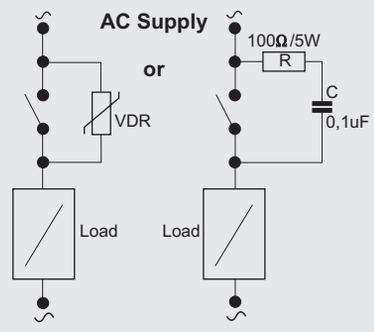
Contact Data		
Material:		AgCdO
Initial Contact Resistance:		50mΩ max. At 1A, 6V DC
Service Life	Mechanical:	10^7 ops
	Eletrical:	10^5 ops

Characteristics	
Insulation Resistance:	1000MΩ, at 500V DC, 50%RH
Dielectirc Strength:	1000Vrms, 1min. Between open contacts 2500Vrms, 1min. Between poles
Shock Resistance:	10g, 11ms. Functional; 100g, destructive
Vibration Resistance:	5g/10g, 30 - 150Hz

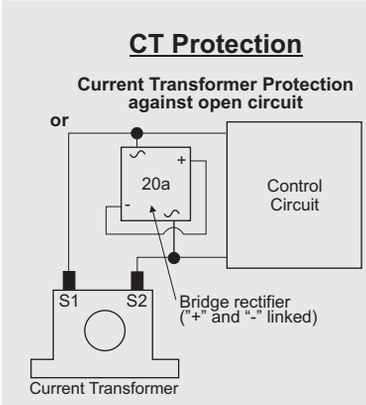
Spark Quenching & CT Protection



Note: *Voltage rating of the (Zener) diode should be higher than the DC supply voltage. Observe the correct polarity.*



Note: *Voltage rating of the VDR or the capacitor "C" must be higher than the supply voltage. Different values for "R" and "C" may have to be chosen, depending on the load.*



Note: *Connection of the bridge rectifier to be as close as possible to the current transformer. CT protection.*

Rated Motor Current Conversion Table

RATED POWER		THREE PHASE SUPPLY 50 - 60Hz					
		220V	380V	415V	440V	500V	660V
kW	Hp	A	A	A	A	A	A
0.37	0.5	1.8	1.03	-	-	1	0.6
0.55	0.75	2.75	1.6	-	-	1.21	0.9
0.75	1	3.5	2	2	1.68	1.5	1.1
1.1	1.5	4.4	2.6	2.5	2.37	2	1.5
1.5	2	6	3.5	3.5	3.06	2.6	2
2.2	3	8.7	5	5	4.42	3.8	2.8
3	4	11.5	6.6	6.5	5.77	5	3.8
4	5.5	14.5	8.5	-	-	6.5	4.9
5.5	7.5	20	11.5	22	10.4	9	6.6
7.5	10	27	15.5	14	13.7	12	8.9
10	13.5	35	20	-	-	15	11.5
11	15	39	22	21	20.1	17	12.7
15	20	52	30	28	26.5	23	17.3
18.5	25	64	37	35	32.8	28.5	21.3
22	30	75	44	40	39	33	25.4
30	40	103	60	55	51.5	45	34.6
37	50	126	72.5	66	64	55	41.8
45	60	147	85	80	76.3	65	49
55	75	182	105	-	-	80	60.6
75	100	239	138	135	125	105	79.8
90	125	295	170	165	156	129	98
110	150	356	205	200	186	156	118
132	175	425	245	230	216	187	141
160	220	520	300	-	-	228	173
200	270	640	370	-	-	281	214
220	300	710	408	385	-	310	235
250	350	823	475	450	-	360	274
315	430	1000	584	-	-	442	337

Note: *Star-Delta rating calculated at full load current x 0.58*

HOW TO ORDER
PROCESS CONTROLLERS

Slimline Ordering Code

SC	100	230V	AC	SP	24*	DRG*

Note: ** for the SC-900 only.*

SUPPLY

Code	Supply *
V AC	AC
DRG	DC Regulated
DC	DC Unregulated

OUTPUT VOLTAGE

Code	Output Voltage *
12	12V
24	24V
36	36V

RELAY CONTACTS

Code	Relay Contacts
SP	Single pole double throw
DP	Double pole double throw
SP **	Single pole single throw
DP **	Double pole single throw

***** Only for the SC-301***

POWER SUPPLY

Code	Power Supply
AC	AC
DC	DC

VOLTAGE

Code	Voltage
012V	012V
024V	024V
030V	10-30V
048V	48V
060V	60V
110V	110V
230V	230V
380V	380V
400V	400V
415V	415V
525V	525V

MODEL

Code	Model
100	Control Module for Resistive Sensor
130	Liquid Level Control
230	Level Control Module for use with Namur Sensor
300	Control Module for Namur Sensor
301	Intrinsically Safe Control Module for Namur Sensor (Ex ib) Gr 2C, T6
314	3-Wire DC Sensor Interface Relay Module
320	Tachometer Relay
410	Opto-Electronic Control Unit
501	Temperature Control Module (PT-100)
510/511	Thermistor Motor Protection Module
610/611	Flip-flop Relay without/with Memory
900	Power Supply Module AC to DC 12, 24, 36V DC

TYPE

Code	Type
SC	Slimline Process Controllers, 11-pin plug-in

A-line Ordering Code

AC	221	230	A	D

RELAY CONTACTS

Code	Relay Contacts
S	Single pole double throw
D	Double pole double throw

POWER SUPPLY

Code	Power Supply
A	AC
D	DC

VOLTAGE

Code	Voltage
012	12V
024	24V
048	48V
060	60V
110	110V
115	110V-120V
230	220V-240V
400	380V-415V
525	525V

MODEL

Code	Model
130	Liquid Level Controler

TYPE

Code	Type
AC	A-line Process Controllers, DIN Rail Mount