

DESIGO™ RXC

Controller with **RXC34.1/ALG** **LONWORKS® interface**

Optimized for the control of room supply air and room extract air in laboratory rooms.

The RXC34.1/ALG controller is used in conjunction with LONWORKS® communications for centralized room control functions.

- LONWORKS® bus communications
- 8 volt-free relay contacts (changeover contacts)
- 8 analog outputs, DC 0...10V
- 4 digital inputs for fast data acquisition, e.g. for meters (non-floating)
- 14 universal inputs
(DC 0...10V / 0...20mA / Pt100 / Pt1000 / Ni1000 / PTC / NTC)
- Operating voltage AC 24 V / DC 26...35V

Application

The controller application is determined by downloadable application software, also referred to simply as the “application”. The application and its functions in relation to the RXC34.1/ALG is described in the RXC applications library (CA1100300).

The RXT10 commissioning and service tool is used to download the application and to commission the RXC34.1/ALG (see "Commissioning").

The controller is delivered with laboratory application LAB02, for use in a laboratory environment.

Functions

The controller functions are determined by the selected application and its parameters.

For a detailed description of functions, refer to the DESIGO RXC Applications library, document CA110300.

Types

RXC34.1/ALG Controller

Ordering

When ordering, please specify the quantity, product name and type code.

The controllers are delivered with laboratory application LAB02 for use in a laboratory environment.

The controllers are delivered in packs of six, including connection terminals.

Example of an order for twelve (12) controllers

2 Packs RXC34.1/ALG

Design

The processor card is accommodated in a two-part sheet-metal housing. This housing is designed for mounting on a standard DIN rail or a mounting plate. The housing has apertures for four clips for secure wall mounting.

The supply voltage and process signals are connected via plug-in terminals.

Protection from physical contact

To prevent accidental physical contact with relay connections carrying voltages in excess of the SELV voltage range ($U_{\text{eff}} > 42$), the device must be fitted in a housing (preferably a control panel). This enclosure must be accessible only by use of a key or tool.

Alternatively, a commercially available contact guard can be used.

Suggested enclosure supplier: Spelsberg):

- Serial terminal enclosure RK 4/50 L, Order No. 616 950 01 (including DIN rail and cable gland)
- or with transparent cover: TK empty housing PS 3625-11-tm, Order No. 106 012 01 (please order DIN rail and cable gland separately)

Suggested contact guard:

- Cover type AC2, supplied by Waldner

Connection terminals

Wago plug-in terminal blocks are used for the connection terminals.

The RXC34.1/ALG comes with connectors without strain relief.

Connector	Contact spacing (mm)	Conductor cross-section / mm ²	Order No.	
			Without cable strain relief	With cable strain relief
X1	5.08	0.08..2.5	231-302/026-000	/032-000
X3,X4,X5,X6	7.62	0.08..2.5	231-706/026-000	/034-000
X7,X8	3.81	0.08..1.5	734-204	/033-000
X9,X10	3.81	0.08..1.5	734-206	/033-000
X11,X12	3.81	0.08..1.5	734-214	/035-000

The LONWORKS® bus connection terminal is a type MSTB 2,5/2-ST-5,08 connector, supplied by Phoenix Contact.

LONWORKS®	5.08	0.2..2.5	1757019	None
-----------	------	----------	---------	------

Communication

The RXC34.1/ALG controller communicates with other devices via the following ports:

- LONWORKS® bus for communication with
 - the PXR system controller or the NIDES.RX interface (to DESIGO)
 - Other DESIGO RXC devices
 - LONMARK®-compatible third-party devices (e.g. occupancy sensors)
- Service socket (RJ45) on the controller for:
 - Service PC

DIP switches

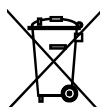
The DIL programming switch block S1 is located adjacent to the connection terminals. The switch settings are not relevant to the application.



Caution

Note, however, that DIL 1 must always be set to ON (factory-setting)

Disposal



The device includes electrical and electronic components and must not be disposed of as domestic waste.

Current local legislation must be observed.

AC 24 V or DC 26 ... 35 V supply voltage



Caution

The supply voltage for the RXC34.1/ALG must be volt-free.
It is connected via plug-in terminal block X1 (terminals X1.1 and X1.2).

- **A supply voltage in excess of AC 29 V can cause damage to the device.**
- **The supply voltage for the RXC34.1/ALG must not be earthed.**
Failure to comply with this instruction can cause damage to the device.
- **The power transformer must be volt-free on the secondary side.**

Transformer data:

Primary voltage: 230 V
Secondary voltage: AC 24 V 15%
Power 15 VA
Fuse on secondary side: 2 A (slow blow)

The primary side can be protected by a motor circuit breaker or fuse.

Electrical values:

Supply voltage: AC 24 V \pm 15%, 50 / 60 Hz or
DC 26 V .. 35 V
Current consumption: Approx. 0.3 A with full configuration

Earthing:

The RXC34.1/ALG housing is earthed by connecting a cable-lug with a conductor cross-section $\geq 10\text{mm}^2$ (copper) to the central earthing point.

Conductor cross-section

Owing to the use of cage-clamp terminals, the cross-section of the cables connected to X1 must not exceed 2.5mm^2 .



Caution

The transformer supply voltage must be used exclusively for the RXC34.1/ALG and not for other devices (such as sensors, valves, damper actuators etc.) as this would cause a short circuit.
These devices must be supplied from a separate transformer or separate transformer winding (see also connection diagrams).

Universal inputs

The negative poles of the 14 universal inputs UE1..UE14 are interconnected inside the controller. They have no direct contact with the RXC34.1/ALG housing.

The configuration of the inputs is determined by the application.

In principle they can be configured as follows:

- 0 .. 10 V voltage input
- Digital input (24V, max. 4.5 mA)

It takes approximately 30 ms to convert an analog input signal. For inputs configured as digital, the conversion time is reduced to approximately 12 ms. In the "worst case" scenario, it can take approximately 420 ms to convert all 14 universal inputs.

The universal inputs are controlled by multiplexer.

Conductor cross-section

Owing to the use of cage-clamp terminals, the cross-section of the connecting cables must not exceed 1.5mm^2 .

EMC precautions

- With the exception of the digital input cable, all connecting cables should be screened, twisted-pair signal cables. Every universal input connection should be a twisted pair.
- For active measuring transducers with 3-wire connections, note the following:
The measuring transducer should be connected using two twisted pairs. One twisted pair is used for the power supply, and the other for the signal, with the transducer acting as frame earth.
- The conductor screen must be connected to a shield bus, ensuring good surface contact, before connection to the RXC34.1/ALG.

Digital inputs, fast counting

The fast-counting binary inputs BE1 .. BE4 are used to read switch states and count switching pulses with a maximum switching frequency of 50 Hz.
Only volt-free contacts may be connected to the binary inputs.
The contacts are interrogated with approximately 24 V / 6 mA
The maximum counter frequency is 50 Hz, defined by the software.

Conductor cross-section

Owing to the use of cage-clamp terminals, the cross-section of the connecting cables must not exceed 1.5mm².

Volt-free relay outputs up to AC 250 V

The digital outputs are designed as volt-free relay contacts. The contacts have a rating of max. AC 230 V and max. 2A.


The relays are arranged in two groups:

BA1 .. BA4 Changeover contacts

BA5 .. BA8 Changeover contacts



Caution

-  Within any one of these groups, only one operating voltage, either AC 230 V or safety low voltage may be used.
Mixed operation within a group is *not* permissible.
- Protective circuits, interference suppression etc. must be implemented externally, according to the application.
-



Recommendation: Minimum contact rating:

AC 230 V ±20%: 5 mA

AC 24 V ±20%: 20 mA

DC 5 V: 100 mA

Conductor cross-section

Owing to the use of cage-clamp terminals, the cross-section of the connecting cables must not exceed 2.5mm².

Analog outputs

Analog outputs AA1 .. AA8 have the following features:

- The outputs generate voltages from DC 0 .. +10 V
- Maximum load current 5 mA
- 10-bit resolution
- The outputs are short-circuit-proof
- The outputs are non-floating
- Protective circuit: immunity up to +24 V
- Maximum load impedance: 2 kΩ

Conductor cross-section

Owing to the use of cage-clamp terminals, the cross-section of the connecting cables must not exceed 1.5mm².

EMC precautions

- All signal cables must be screened
- Every analog input connection should be a twisted pair.
- The conductor screen must be connected to a shield bus, ensuring good surface contact, prior to the RXC34.1/ALG connection.

Status LEDs

The RXC34.1/ALG housing incorporates four LEDs for status indication.

LED	Color	Operating state	
		Normal operation	Application terminated
CTRL (LED1)	Green	Flashing	OFF
FAULT (LED2)	Red	OFF	OFF
COM (LED3)	Green	OFF	ON
OK (LED4)	Green	Fast flashing	Fast flashing

Commissioning


The RXC34.1/ALG controller is commissioned with the RXT10 commissioning and service tool. This tool is connected to the LONWORKS® bus.

Note The LONWORKS® bus can be connected and reconnected whenever necessary, without switching off the power.



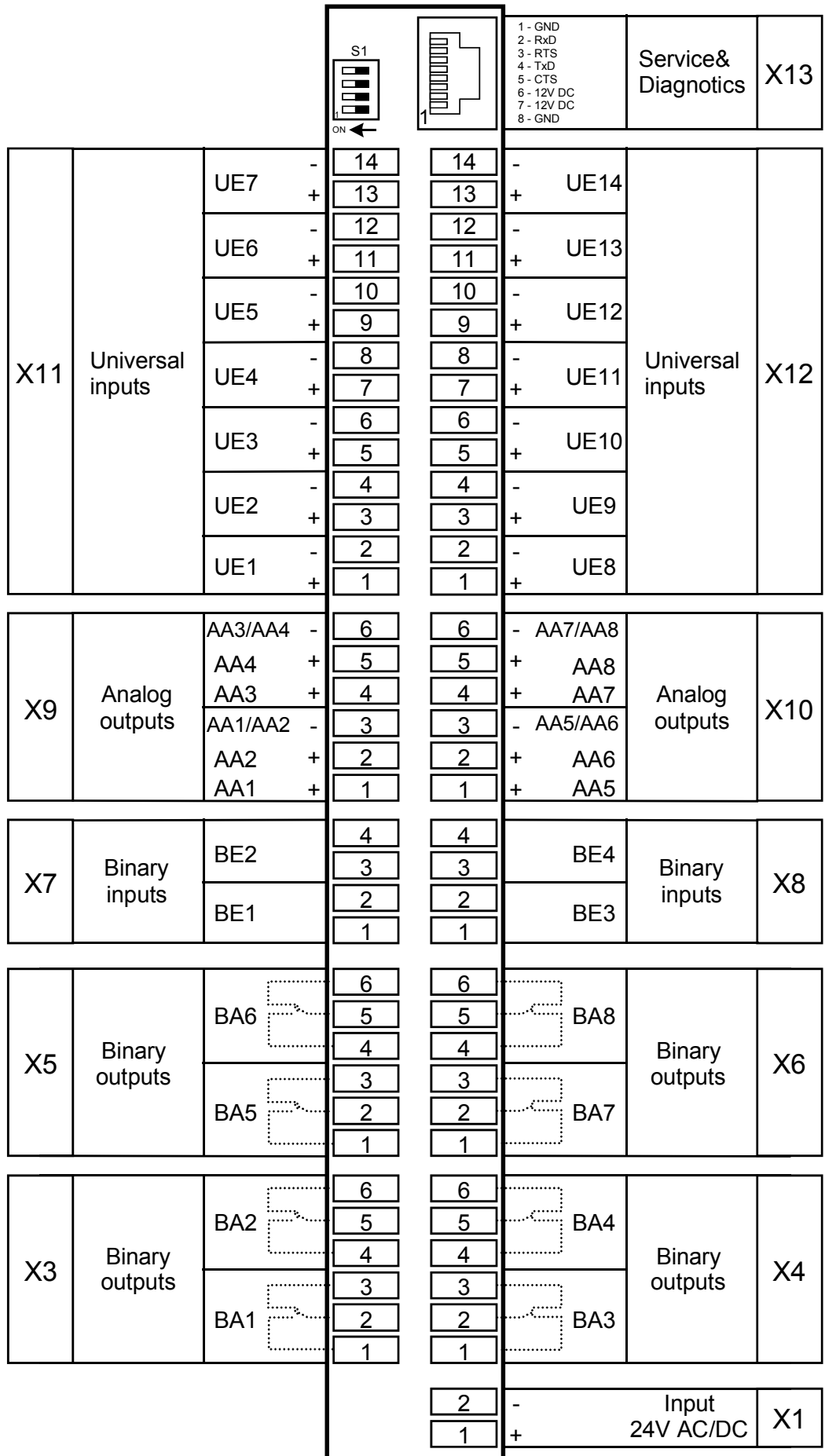
Caution There is no protection against the accidental connection of AC 230 V on the AC 24 V side.

Technical data

Power supply	Operating voltage	AC 24 V \pm 15%, 50 / 60 Hz or DC 26...35 V
	Current consumption with full configuration	0.3 A
	Internal fuse	Thermal, non-resetting
	<i>(This means that if the fuse blows, the controller must be replaced)</i>	
Universal inputs, configured via the application	All universal negative input terminals (–) are connected internally.	
	Quantity	14, (UE1...UE14)
	Conversion time	Approx. 30ms per analog input and approx. 12ms per digital input
	Protective circuit	Immunity up to +24V
Use as voltage input	Input voltage	DC 0...10 V, non-floating
	Impedance	Approx. 100 k Ω
	Resolution	10 Bit
	Offset error	0.2 %
	Gain error	\pm 0.3 %
Use as current input	Input current	0...20mA (via external shunt resistor 100 Ω)
	Resolution	10 bits
	Offset error	0.5 %
	Gain error	\pm 1 %
Use with Pt100 element	Sensor current	400 μ A
	Resolution	0.1 K
	Accuracy	\pm 2 K
Use with Pt1000 or Ni1000 element	Sensor current	400 μ A
	Resolution	0.1 K
	Accuracy	\pm 2 K
Use as a digital input	No external supply possible; circuit with volt-free contacts	
	Input frequency	Max. 20 Hz
Digital inputs (fast counting)	Quantity	4, (DI1...DI4) non-floating No external supply possible; volt-free contacts must be connected
	Voltage at input (terminals X7, X8)	DC 24 V
	Input frequency	Max. 50 Hz
Outputs Relay outputs	 SELV and non-SELV voltages must not be connected to the same RXC34/ALG controller.	
	Number of outputs	8 (changeover contacts)
	Contact rating with AC voltage	
	Switching voltage	Max. AC 250 V, min. AC 12 V
	Nominal current	Max. 2 A
	Switching current	Min. AC 500 mA
	Contact rating with DC voltage	
	Switching voltage	Max. DC 250 V, min. DC 12 V
	Switching current at DC 12 V	Min. DC 500 mA

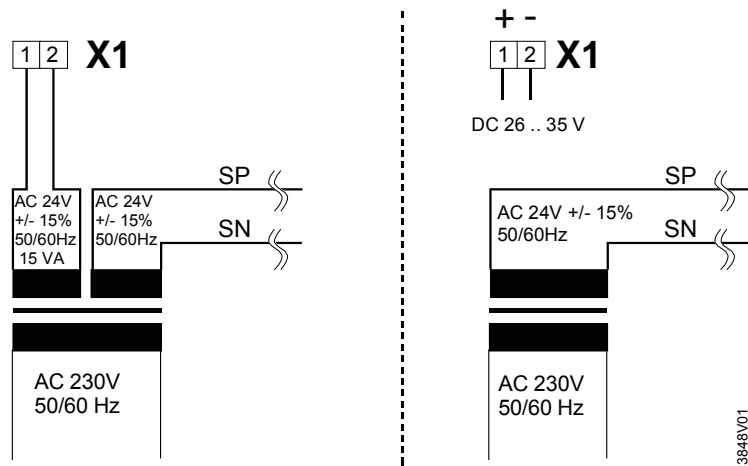
Analog outputs	Number	8 (AA1...AA8)	
	Output voltage	DC 0...10 V, non-floating	
	Linearity error	± 2 bits = 20 mV	
	Offset error	0.5 %	
	Gain error	± 0.5 %	
	Resolution	10 bits	
	Load current	5 mA	
	Setting time	Approx.	
	Protective circuit	Up to 24 V without interference	
Ports/interfaces	Field-device interfaces	X1...X12, Wago cage-clamp plug-in connectors at	
	Serial interface	X13, RJ45 socket, 8-pin	
	Interface for external extension modules	Sub-D, 9-pin male	
	LONWORKS® bus	LONMARK®-compatible,	
	Medium	electrically isolated	
	Transceiver	TP/FT-10	
	Baud rate	FTT-10A	
Bus topology, bus termination	78 kbit/s See Installation guide, CA110334		
Housing protection	Protection standard to EN 60529	IP20	
Protection class	Humidity class	F to DIN 40040	
Ambient conditions	Air pressure	Normal operation	Min. 700 hPa, equivalent to max. 3000 m above sea level
		Transport	Min. 260 hPa, equivalent to max. 10,000 m above sea level
Temperature	Operation		-10...+50 °C
	Storage		-30...+70 °C
Industry standards	Mechanical strength		DIN IEC 68-2-32
	EMC measurement		EN 61000-6-1; EN 61000-6-3
	Vibration and shock testing		EN 60068-2-27/31/32
	Environmental testing		EN 60068-2-14
	Storage temperature		EN 60068-2-1/2
	Humidity test		DIN IEC 60068-2-30
	Temperature test		EN 60068-2-14
Dimensions	W x H x D		284 mm x 158 mm x 54 mm
	Width in DIN modular spacing units		16
General data	Mounting methods		EN 50022 DIN-rail, 37 x 7.5 mm
	Color		RAL 7016, anthracite gray
Weight	Excluding packaging		1.35 kg

Connection terminals



10314A02en

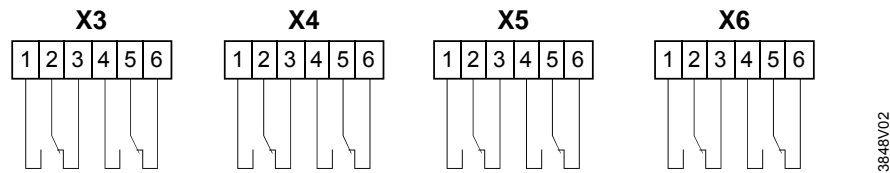
Supply X1



Caution

The AC 24 V supply voltage for the RXC34.1/ALG and for the active transmitters/sensors must be generated via a transformer with **two separate windings** (to prevent short-circuiting).
As an alternative, two separate 24 V transformers may be used.

Relay outputs X3...X6

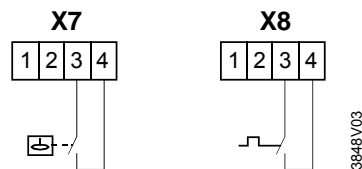


Relay outputs AC 24 .. 230 V, 2A

Any **protective circuitry, interference suppressors** etc. must be implemented **externally**, according to the application.

Counter inputs X7 and X8

Use of the digital inputs for fast counting (max. 50 Hz)



Volt-free contact, no external voltage required.
Terminals 1 and 3 are at DC +24 V

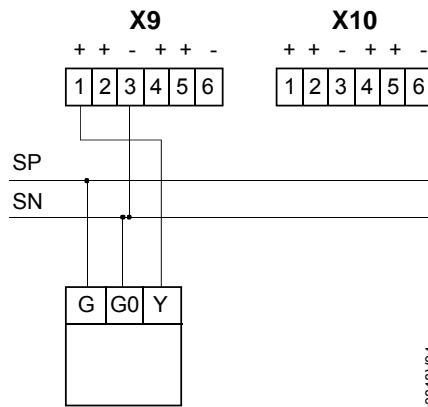
**Analog outputs
X9 and X10**



Note!

Each pair of analog outputs has a common ground (**NOT G0!**).
(e.g. terminal X9.3 is ground for X9.1 and X9.2).

Connecting terminals 3 or 5 to G0 will damage the printed circuit board!



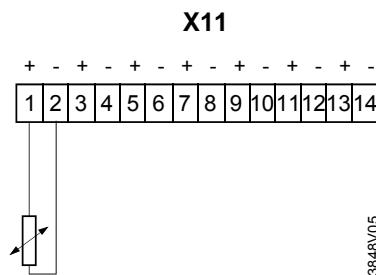
3848V04

Analog outputs

Rotary actuator AC 24 V

DC 0 .. 10 V input

**Universal inputs
X11/X12
with passive sensor**

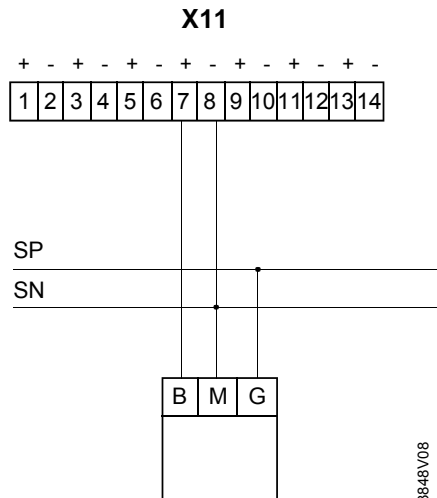


3848V05

Universal inputs

Pt1000, Pt100 or LG-Ni 1000
temperature sensor
(LAB applications: LG-Ni1000 only)

**Universal inputs
X11/X12
with active sensor
voltage**

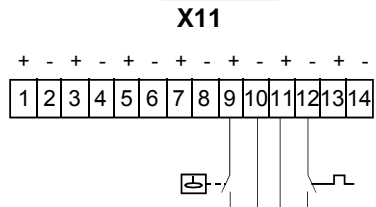


3848V08

Universal inputs

Active sensor with DC 0 .. 10 V
output signal

**Universal inputs
X11/X12
with signal contact**

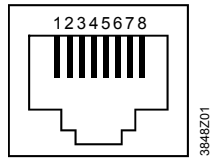


3848V09

Universal inputs

Digital signal sources

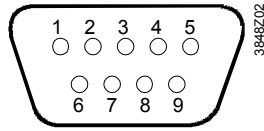
Service and diagnostics socket X13



RJ45

- 1 GND
- 2 RxD
- 3 RTS
- 4 TxD
- 5 CTS
- 6 +12V
- 7 +12V
- 8 GND

Connector for extension modules X14

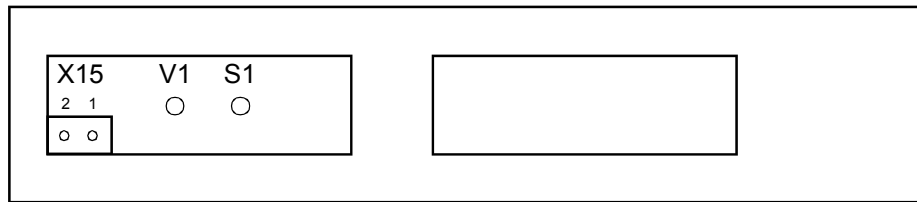


RS232, D-SUB 9

- 1 --
- 2 TxD+
- 3 RxD+
- 4 --
- 5 GND
- 6 --
- 7 TxD-
- 8 RxD-
- 9 --

LONWORKS® bus connector X15

The LONWORKS® bus connector, LONWORKS® service pin and the LONWORKS® node status LED are located on the surface facing the terminal block.



X15 LONWORKS® port Pin 1 = LONWORKS®, Data A (CLA)
Pin 2 = LONWORKS®, Data B (CLB)
(interchangeable)

V1 Service LED for LONWORKS® node

S1 LONWORKS® node service pin

Dimensions

All dimensions in mm

