



# Installation & Maintenance Manual

## SI unit for IP-Link

### Type EX250-SBI1-X41



## Safety Instructions

This manual contains essential information to prevent possible injury and property damage and to ensure correct handling. Please confirm you understand the meaning of the following messages (signs) before reading the text, and always follow the instructions. Please read carefully the instruction manual of related equipment or apparatus before use.

### IMPORTANT MESSAGES

Read this manual and follow its instructions. Signal words such as WARNING, CAUTION and NOTE, will be followed by important safety information that must be carefully reviewed.

<b>⚠ WARNING</b>	Indicates a potentially hazardous situation which could result in death or serious injury if you do not follow instructions.
<b>⚠ CAUTION</b>	Indicates a potentially hazardous situation which if not avoided, may result in minor injury or moderate injury.
<b>NOTE</b>	Gives you helpful information.

### ⚠ WARNING

**Do not disassemble, modify (including change of printed circuit board) or repair.**

An injury or failure can result.

**Do not operate the product outside of the specification range.**

Fire, malfunction, or damage can result.

Verify the specifications before use.

**Do not use the product in an atmosphere containing combustible, explosive or corrosive gas.**

Otherwise fire, explosion or corrosion can result.

The product is not designed to be explosion-proof.

**Do not apply voltage over 250 between the lead wire and metal fitting.**

The lead wire insulation could be damaged and could cause product failure.

Attention should be taken during insulation test.

**When using the product in an interlocking circuit:**

- Provide double interlocking by another system such as mechanical protection

- Check the product regularly to ensure proper operation

Otherwise malfunction can cause an accident.

**When performing maintenance ensure the following:**

- Turn off the power supply
- Stop the supplied air, exhaust the residual pressure and verify the release to atmosphere.

Otherwise injury could result.

### ⚠ CAUTION

**Perform proper functional checks after maintenance.**

Stop operation when an abnormality is observed or the product is not working properly.

Safety can not be assured due to unexpected malfunction.

## Safety Instructions (continued)

### NOTE

Use the following UL authorized direct-current power supply:

1. Limited voltage / current circuit in accordance with UL508.
  - A circuit to which power is supplied by the secondary coil of an isolating transformer that meets the following conditions:
    - Maximum voltage (with no load) : less than 30Vrms (42.4V peak)
    - Maximum current : (1) less than 8A (including when short circuited) (2) limited by circuit protector (such as fuse) with the following ratings

No load voltage (V peak)	Max. current rating (A)
0 to 20 [V]	5.0
20 to 30 [V]	100 / peak voltage

2. A circuit using max. 30Vrms or less (Class-2 circuit), whose power is supplied by Class-2 power supply unit in accordance with UL1310 or Class-2 power supply unit in accordance with UL1585.

Follow the instructions given below when handling the SI unit. Failure to follow instructions may damage the unit.

- Operate the SI unit within the specified voltage range.
- Reserve a space for maintenance.
- Do not remove labels.
- Do not drop, hit or apply excessive shock to the unit.
- Follow the specified tightening torque.
- Do not bend the cables or apply excessive force to them by pulling or placing heavy load.
- Connect wires and cables correctly.
- Do not connect wires while the power is supplied.
- Do not lay wires or cables with the same wiring route as a power line or high-voltage line.
- Verify the insulation of the wiring.

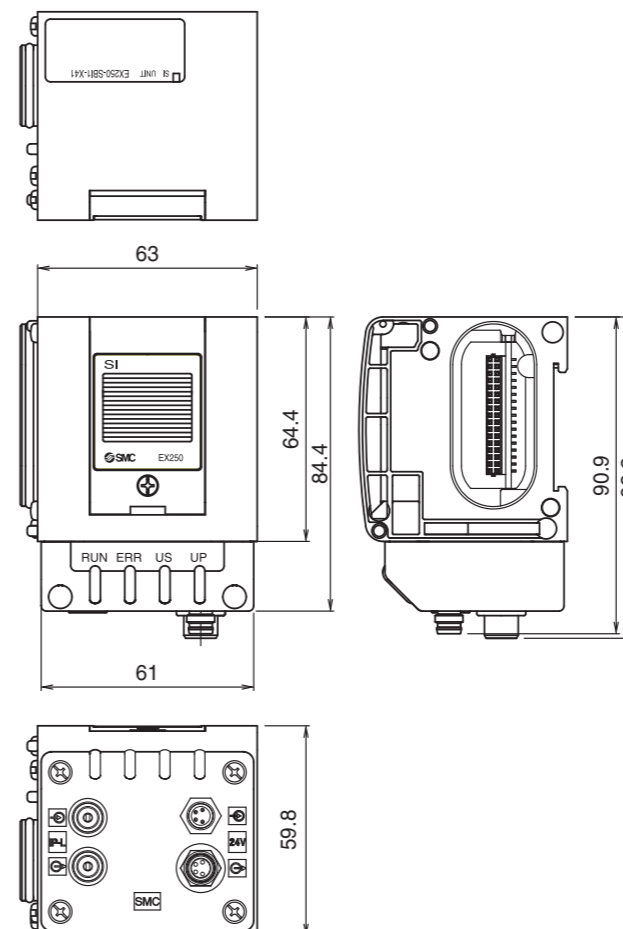
- Wire power supplies as two systems, one for solenoid valves and the other for SI unit control.
- Take proper measures against noise such as a noise filter when the SI unit is incorporated in equipment or devices.
- Consider an operating environment suitable for protection class.
- Take sufficient shielding measures when the unit is installed.
- Do not use the unit near by a place where an electric surge is generated.
- Use SI unit equipped with surge absorber when a surge-generating load such as solenoid valve is driven directly.
- Prevent foreign matter such as remnant of wires from entering the unit.
- Do not expose SI unit to vibration and impact.
- Keep within the specified ambient temperature range.
- Do not expose SI unit to heat radiation from a heat source located nearby.
- Perform maintenance and check regularly.
- Perform a proper functional check.
- Do not use solvents such as benzene, thinner or other to clean SI unit.

## Specification

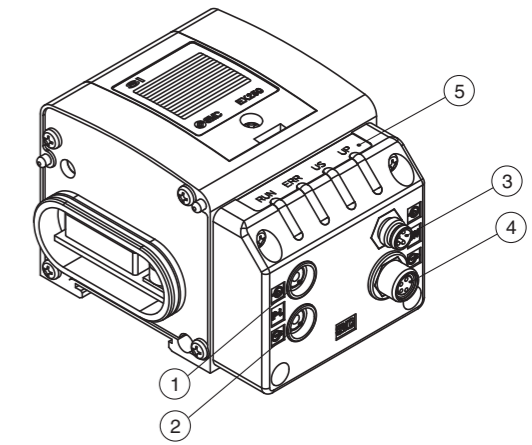
### Specification table

Item	Specification	
Communication spec.	BECKHOFF IP-Link system	
Rated voltage	24VDC	
Power supply voltage range	SI unit control power supply : 24VDC + 20% / -15% Solenoid valve power supply : 24VDC + 10% / -5%	
Output point	16 points	
Short-circuit protection	Applied	
Current consumption	100mA or less	
Allowable instantaneous power failure	1ms or less	
Environmental specification	Protection	IP67
	Withstand voltage	500VAC, 1min
	Insulation resistance	10MΩ or more, 500VDC
	Ambient temp.	Operating temp. : 5°C to 45°C Storage : -20°C to 60°C
	Ambient humidity	35% to 85% (No freezing)
	Vibration resistance	5Hz to 9Hz (Constant amplitude) 1.75mm 9Hz to 150Hz (Constant acceleration) 4.9m/s <sup>2</sup> 3 times in each X, Y, Z direction (Accordance with JIS B 3502, IEC61131-2)
	Impact resistance	147m/s <sup>2</sup> 3 times in each X, Y, Z direction (Accordance with JIS B 3502, IEC61131-2)
Operating atmosphere	No corrosive gas	
Corresponding standard	UL/CSA (E209424), CE marking	
Weight	250g	

## Outline with Dimensions (in mm)

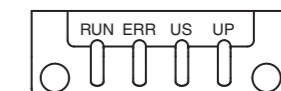


## Name of parts



No.	Description	Application
1	IP-Link connector (IN)	Connect to IP-Link line using IP-Link connector.
2	IP-Link connector (OUT)	
3	Power connector (IN)	Supply SI unit control power and solenoid valve power by using M8 4 pin connector.
4	Power connector (OUT)	
5	Display	Unit status is displayed by LED.

## LED display



Description	Function	Indication
US	SI unit control power is supplied	Green light on
	SI unit control power is not supplied	Light off
UP	Solenoid valve power is supplied	Green light on
	Solenoid valve power is not supplied	Light off
RUN	Communication is normal	Green light on
	Optical data receiving start, or damped optical data is received	Green flashing
	Communication disconnected	Light off
ERR	Optical data is not received	Red light on
	Damped optical data is received	Red flashing
	Optical data is received	Light off

## Mounting / installation

### Installation

#### • Manifold type

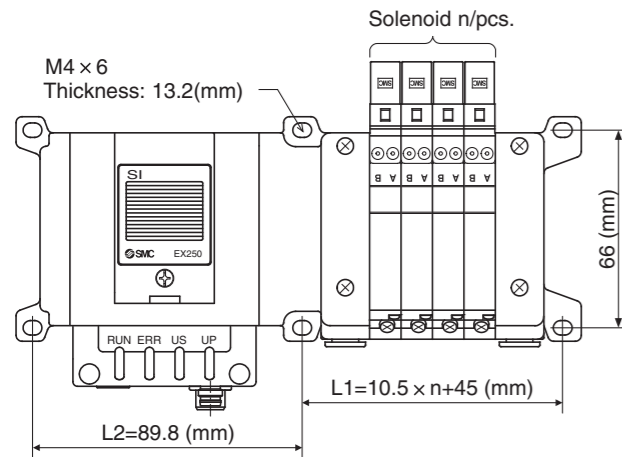
Representative series	Applicable type
VQC series	VQC1000, VQC2000, VQC4000
SV series	SV1000, SV2000, SV3000 (10 type tie rod base)

\*For details of the solenoid valve and manifold, see the catalogue and the operation manual of each valve series.

#### • Mounting manifold

Because there is no mounting hole on SI unit, it can not be used alone. Be sure to connect manifold to SI unit for correct mounting.

### Installation example



See the table below for dimensions when VQC1000 series solenoid valve manifold is connected.

For other solenoid valve dimensions, see the catalogue.

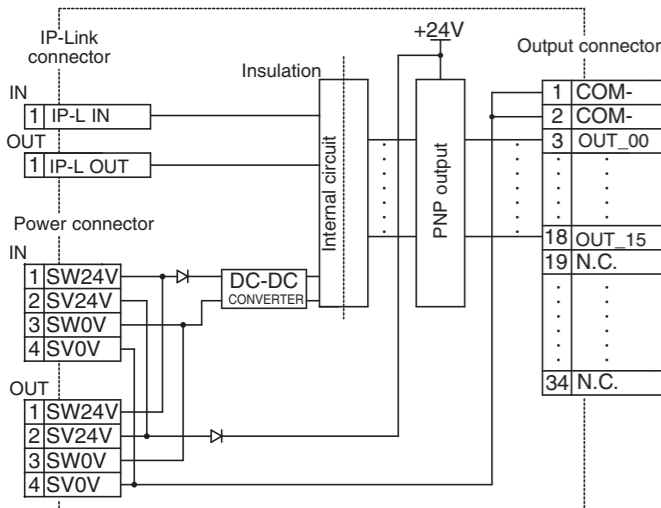
n	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	45	55.5	66	76.5	87	97.5	108	118.5	129	139.5	150	160.5	171	181.5	192	202.5	213

Wiring (for power and communication) and piping can be done only one side.

Space for piping/wiring is necessary in that direction.

### Wiring

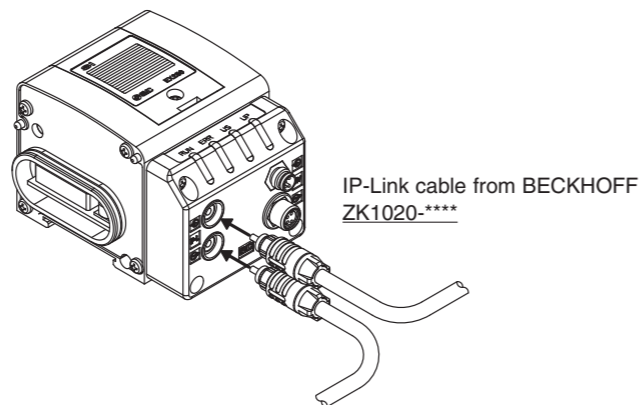
#### • Internal circuit



## Mounting / installation ( continued)

#### • Communication wiring

Connection of IP-Link cable and SI unit IP-Link connector.

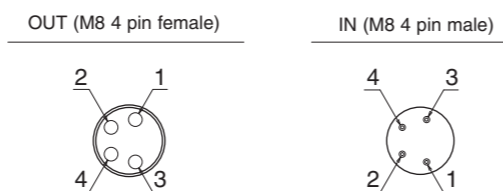


#### • Power supply wiring

In the unit, Solenoid valve power supply (SV) and SI unit control power supply (SW) are independent.

Supply 24VDC for each of them.

Either single or dual power supply options are available.



Pin No.	Description	Function
1	SW24V	SI unit control power supply + 24V
2	SV24V	Solenoid valve power supply + 24V
3	SW0V	SI unit control power supply 0V
4	SV0V	Solenoid valve power supply 0V

## Maintenance

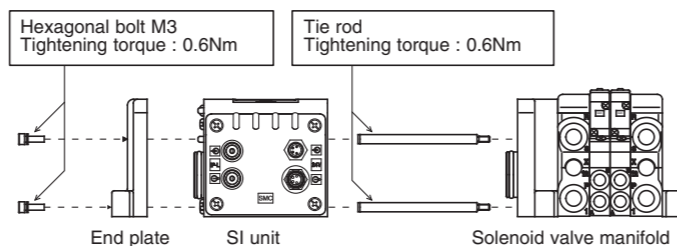
#### Replacement of SI unit

- Remove the end plate bolt to separate the unit from the solenoid valve manifold.
- Replace the SI unit. (No need to remove the tie rods)
- Mount removed end plate and tighten the bolt with specified tightening torque (0.6Nm) .

#### Precautions on maintenance

- (1) Ensure the power supply is turned off.
- (2) Ensure no foreign material in the SI unit.
- (3) Ensure no foreign material adhered to the gasket or no damage to the gasket.
- (4) Ensure tightening to the specified tightening torque.  
If component are not properly assembled, this can cause unit failure or fluid or particles can enter into the unit.

#### • Assembly and disassembly of SI unit



## Contact

AUSTRIA	(43) 2262 62280	NETHERLANDS	(31) 20 531 8888
BELGIUM	(32) 3 355 1464	NORWAY	(47) 67 12 90 20
CZECH REP.	(420) 541 424 611	POLAND	(48) 22 211 9600
DENMARK	(45) 7025 2900	PORTUGAL	(351) 21 471 1880
FINLAND	(358) 207 513513	SLOVAKIA	(421) 2 444 56725
FRANCE	(33) 1 6476 1000	SLOVENIA	(386) 73 885 412
GERMANY	(49) 6103 4020	SPAIN	(34) 945 184 100
GREECE	(30) 210 271 7265	SWEDEN	(46) 8 603 1200
HUNGARY	(36) 23 511 390	SWITZERLAND	(41) 52 396 3131
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