

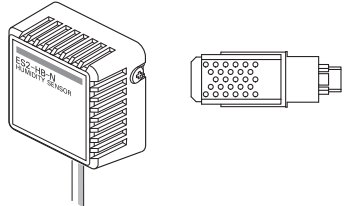
**OMRON**

**Model ES2-HB-N HUMIDITY SENSOR**  
**Model ES2-THB-N TEMPERATURE & HUMIDITY SENSOR**  
**Model ES2-M-N HUMIDITY SENSOR MODULE**

**EN INSTRUCTION MANUAL**

Thank you for purchasing the OMRON ES2 Temperature & Humidity Sensor. This manual describes the functions, performance, and application methods needed for optimum use of the product. Please observe the following items when using the product.

- This product is designed for use by qualified personnel with a knowledge of electrical systems.
- Before using the product, thoroughly read and understand this manual to ensure correct use.
- Keep this manual in a safe location so that it is available for reference whenever required.



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0194653-0A

**Safety Precautions**

**Key to Warning Symbols**

**CAUTION** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.

**Warning Symbols**

- CAUTION** Minor injury due to electric shock may occasionally occur. Do not touch the terminals while power is being supplied. Do not open the cover while power is being supplied.
- Electric shock, fire, or malfunction may occasionally occur. Do not allow metal objects, conductors, cuttings from installation work, or moisture to enter the sensor.
- Never disassemble, modify, or repair the product. Minor electric shock, fire, or malfunction may occasionally occur.
- Loose screws may occasionally result in fire. Size of the screws for the crimping terminal and terminal block should be matched. Tighten the screws with the specified torque. Tighten the internal terminal screws with the specified torque.

**Precautions for Safe Use**

Be sure to observe the following precautions to prevent operation failure, malfunction, or adverse effects on the performance and functions of the product.

- Do not use the product outdoors. Do not use or store the product in any of the following environments.
  - Locations outside the rated temperature and humidity ranges.
  - Locations subject to a constant humidity of 90% min.
  - Locations subject to splashing liquid or oil atmosphere.
  - Locations subject to direct sunlight.
  - Locations subject to intense temperature change.
  - Locations near an heat-emitting device.
  - Locations subject to a hot or cold air.
  - Locations near a hot or cold water piping.
  - Locations subject to icing and condensation.
  - Locations subject to large vibration and shock.
  - Locations subject to dust.
  - Locations where salt is present.
  - Locations subject to inorganic gas (in particular, sulfide, chlorine, and ammonia).
  - Locations subject to organic gas (in particular, alcohol, carboxylic, glucose, ketone, and aldehyde).

- Be sure to observe the followings while removing the cover of the main unit, when installing the main unit, installing and replacing the humidity sensor module, modifying cable outlet, or extending the cable.
  - Do not touch the electric components, and do not give a shock nor excessive forces.
  - When installing the main unit, tighten the two points with M3 to M3.5 screws by the specified torque.
  - When installing the humidity sensor module, firmly insert the connector as far as possible.
  - When cutting the fastening band, do not damage and cut the cable.
  - When fixing the printed circuit board onto the metal frame, be sure to tighten the two screws by the specified torque of 0.49 to 0.59 N·m after the shield terminal is through on the side which has a shield terminal.
  - Do not touch the cutout for screwing on the cover. It may result in injury.
  - Do not touch the folded part of the metal frame after removing the printed circuit board from the metal frame. It may result in injury.

- Use this product within the rated voltage and current.
- Be sure to observe the installation direction of the main unit. Make sure that this product has three seconds or more to warm up after turning the power ON.
- Secure space around the case of the main unit not to block the ventilation holes on the product.
- Be sure to wire properly confirming correct signals and polarity of terminals.
- Be sure to observe the rated output load impedance.
- Turn the power OFF and stop using this product when abnormal operation occurs.

- Separate this product from the power cable with high voltage and current to prevent induction noise.
- Also, do not wire power lines with parallel or common wiring.
- Attach a surge absorber or a noise filter to peripheral devices that generate noise (in particular, motors, transformers, solenoids, magnet coils, or other equipment that have an inductance component).
- Allow as much space as possible between the sensor and devices that generate a powerful high frequency or surge.
- Do not wire anything with crimp terminals which are not used.

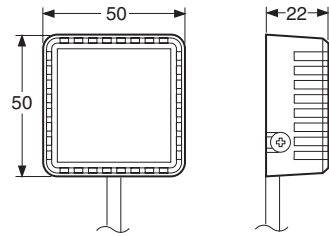
**SPECIFICATIONS (Ratings • characteristics)**

Item	Description
Humidity Sensor	Macro molecule resistive humidity sensor
Observed humidity	20 to 95%
Measuring accuracy	±3% (25°C, 40 to 80%)
Supply voltage	24 VDC *1
Operating voltage range	85 to 110% of supply voltage
Current consumption	4 mA max.
Output	1 to 5 V, load impedance 100 kΩ min.
Temperature Sensor *2	Platinum resistance thermometer
Observed temperature	0 to 55°C
Output	Pt100: 3 conductors
Cable Length	5 m
Ambient Temperature/ Humidity Range *3	0 to 55°C, 95% max.
Storage Temperature/ Humidity Range *3	-20 to 60°C, 95% max.
Weight	ES2-HB-N: Approx. 37g (excluding cable) ES2-THB-N: Approx. 39 g (excluding cable)

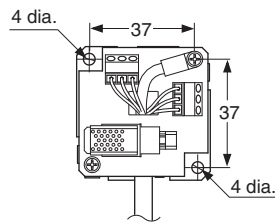
\*1 Ripple voltage 2%p-p max. We recommend using an OMRON S8FS-G or S8VS power supply.  
 \*2 ES2-THB-N only.  
 \*3 Avoid prolonged use or storage at humidity 90% min.

**DIMENSIONS (unit: mm)**

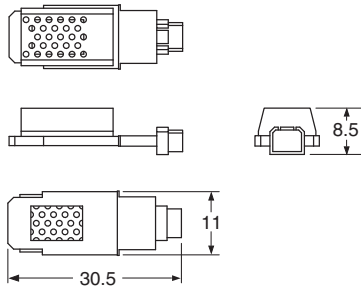
- ES2-HB-N Humidity Sensor
- ES2-THB-N Temperature & Humidity Sensor



- Inside the cover



- ES2-M-N Humidity Sensor Module



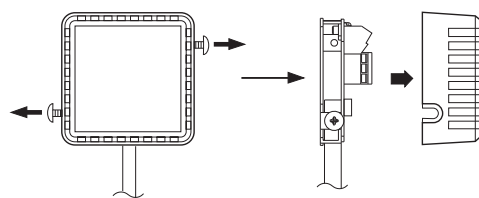
**INSTALLATION**

**Requests**

- Use a screwdriver matched to the size of the screws.
- Mount the Humidity Sensor Module in an environment where little static electricity is generated.

**Method**

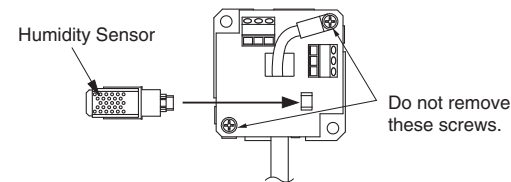
- (1) Remove the cover. Loosen the two screws on the side panels.



- (2) Install the humidity sensor module.

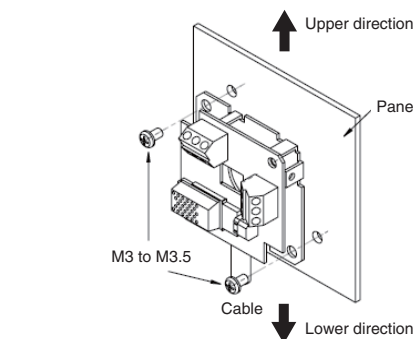
**Requests in Installing the Humidity Sensor Module**

- Do not touch the humidity sensor.
- Firmly insert the connector as far as possible.
- Do not remove the screws in the following illustration.



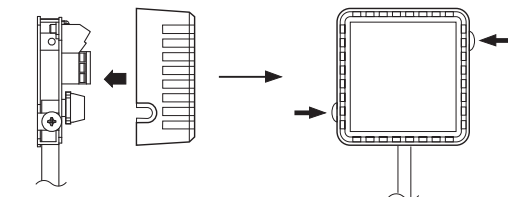
- (3) Fix the humidity sensor module onto the panel as shown in the following illustration.

Be sure to fix the humidity sensor module in the correct direction to ensure measuring accuracy. Prepare M3 to M3.5 screws separately.



- (4) Attach the cover.

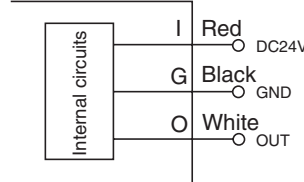
Do not exert excessive force on the cover. Tighten the screws with a torque of approximately 0.39 to 0.47 N·m, or 4.0 to 4.8 kgf·cm.



**WIRING**

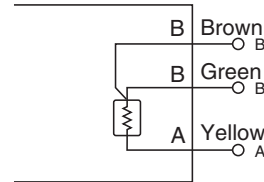
- Humidity Sensor

"I", "O" and "G" are marked on the terminal block label.



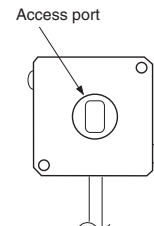
- Temperature Sensor (model ES2-THB-N only)

"A", "B" and "B" are marked on the terminal block label.



- About Drawing Out the Cable from the Rear Panel

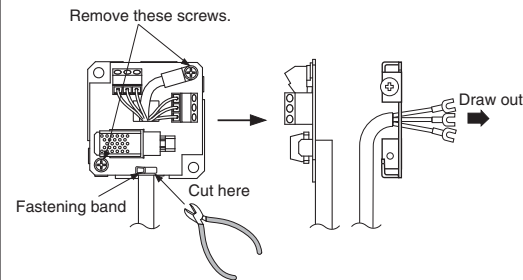
Draw out the cable from the access port on the rear panel as follows.



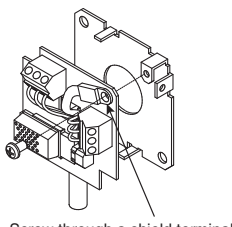
**Requests**

- Do not remove wires already connected to the terminal block.
- Take care to prevent the cable from being damaged when cutting the fastening band.

- (1) Cut the fastening band.
- (2) Remove the two screws.
- (3) Draw out the cable from the access port.

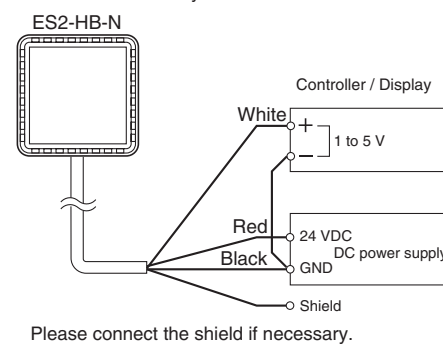


- (4) Fasten the printed circuit board by screws. Tighten the screws with a torque of approximately 0.49 to 0.59 N·m, or 5.0 to 6.0 kgf·cm.

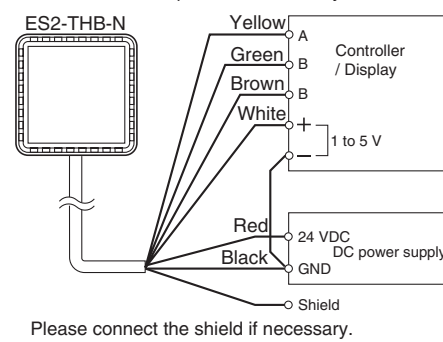


**Wiring Example**

- ES2-HB-N Humidity Sensor



- ES2-THB-N Temperature & Humidity Sensor



**Suitability for Use**

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

See also Product catalog for Warranty and Limitation of Liability.

**About Using Longer Cables**

If the cable (supplied) is not long enough, prepare a separate cable that conforms to the following specifications.

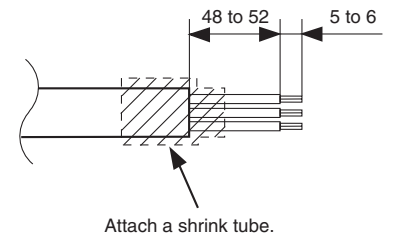
Do not use cables longer than 50 m.

**Cable Specifications**

	ES2-HB-N	ES2-THB-N
AWG Size (conductor diameter)	AWG22	AWG24
No. of conductors (wires)	3	6
Shield	Braid	Braid
Max. Conductor Resistance (at 20°C)	60 Ω /km max.	92 Ω /km max.
Overall Diameter	5.1 mm	5.8 mm

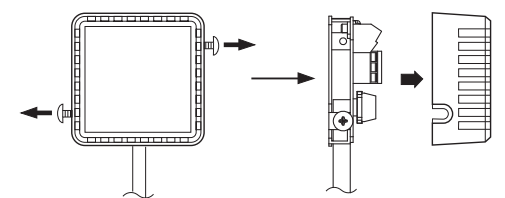
**Processing Cable Ends**

Strip cable wires as follows taking care to prevent shielded wire from protruding.

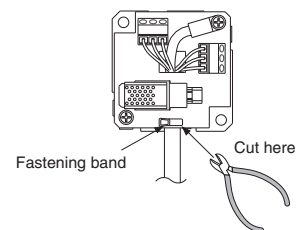


**Replacement Procedure**

- (1) Remove the cover. Loosen the two screws on the side panels.

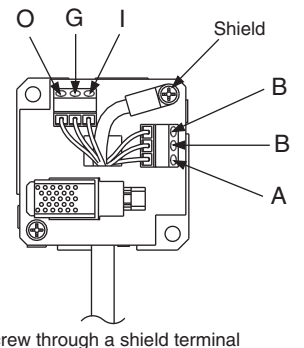


- (2) Cut the fastening band.



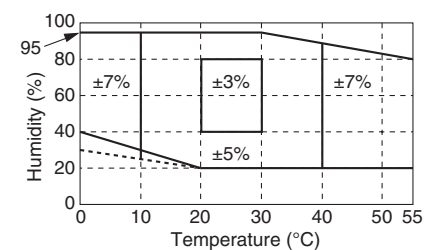
- (3) Remove the supplied cable.

- (4) Wire the separately prepared cable. Tighten the screws with a torque of approximately 0.27 to 0.33 N·m, or 2.8 to 3.4 kgf·cm.



- (5) When drawing out the cable from the side panel, fasten the cable using a fastening band. When drawing out the cable from the rear panel, insert the cable from the access port on the rear panel before wiring.

**Observed Humidity and Measuring Accuracy**



Note: The broken line in the low temperature and low humidity area shows actual value.

OMRON ELECTRONICS LLC  
 2895 Greenspoint Parkway, Suite 200 Hoffman Estates, IL 60169 U.S.A.  
 Phone 1-847-843-7900  
 FAX 1-847-843-7787  
 OMRON ASIA PACIFIC PTE. LTD.  
 No. 438A Alexandra Road # 05-05/08 (Lobby 2), Alexandra Technopark, Singapore 119967  
 Phone 65-6835-3011  
 FAX 65-6835-2711

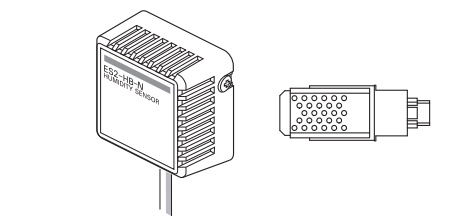
OMRON Corporation  
 Shiokoji Horikawa, Shimogyo-ku, Kyoto 600-8530 JAPAN

OMRON

形ES2-HB-N 湿度センサ
形ES2-THB-N 温湿度センサ
形ES2-M-N 湿度センサモジュール

JPN 取扱説明書

このたびは、オムロン製品をお買い上げいただきまして、まことにありがとうございます。この取扱説明書では、この製品を使用する上で、必要な機能、性能、使用方法などの情報を記載しています。この製品をご使用に際して下記のことを守ってください。



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安全上の注意

警告表示の意味

正しい取扱いをしなければ、この危険のために、時に軽傷・中程度の傷害を負ったり、あるいは物的損害を受ける恐れがあります。

警告表示

注意

- 感電により軽度の障害が稀に起こる恐れがあります。
感電・発火、機器の故障が稀に起こる恐れがあります。
感電・発火、機器の故障が稀に起こる恐れがあります。
ネジが緩むと稀に発火する恐れがあります。

安全上の要点

製品の動作不良、誤動作または性能・機能への悪影響を防ぐため、以下のことを守ってください。

- 屋内のみでの使用とし、下記の環境では使用または保管しないでください。
定格温度範囲外のところ
湿度が常時90%以上のところ
水がかかるところ、被油のあるところ

- 本体の取付、湿度センサモジュールの取付・交換、ケーブル引出口の変更あるいはケーブル延長で、本体カバーを外して作業する場合は、以下のことを守ってください。
電子部品に手を触れたり、衝撃や無理な力を与えたりしないこと

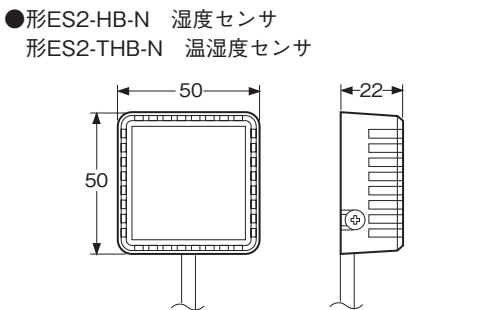
定格電圧・電流の範囲内でご使用ください。
端子の信号名および極性を確認し、正しく配線してください。
誘導ノイズを防止するため、高電圧、大電流の動力線とは分離してください。

仕様 (定格・性能)

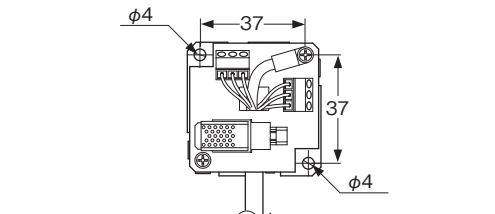
Table with 2 columns: 項目 (Item) and 内容 (Content). Lists specifications for sensor and module parts.

\*1 最大リップル電圧 2%p以下。
\*2 形ES2-THB-Nのみ。
\*3 90%以上の長時間の使用および保存は避けてください。

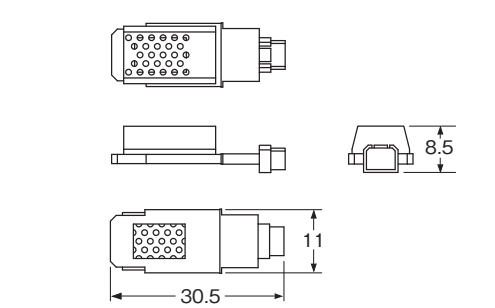
外形寸法図 (単位: mm)



カバー内部



形ES2-M-N 湿度センサモジュール

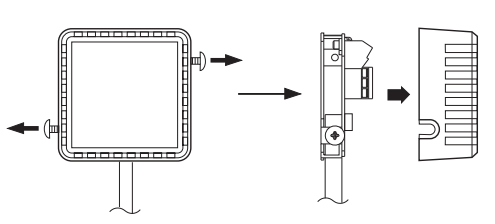


取り付け

- お願い
ドライバはネジに合ったものを使用してください。
取り付けは、静電気の発生が少ない環境で行ってください。

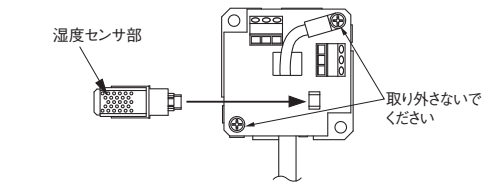
取り付け方

(1) カバーを外します。
側面2カ所のネジをゆるめてください。

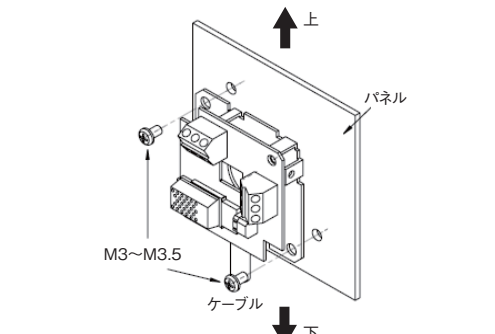


(2) 湿度センサモジュールを取り付けます。

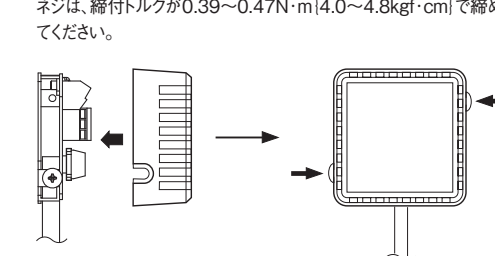
- 取り付け時のお願い
湿度センサ部に触れないでください。
コネクタの根元までしっかりと差し込んでください。



(3) 下図に従ってネジで固定してください。
取付方向は、精度を保证するため必ず守ってください。
ネジはM3~M3.5のものを別途用意してください。

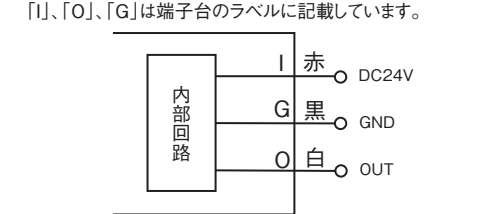


(4) カバーをします。
カバーは強く押さないでください。
ネジは、締付トルクが0.39~0.47N・m [4.0~4.8kgf・cm]で締めてください。

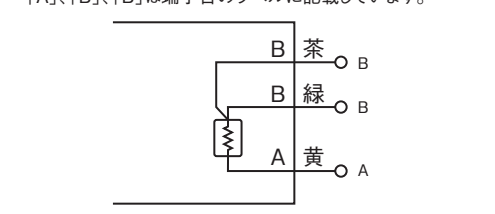


接続

湿度センサ部

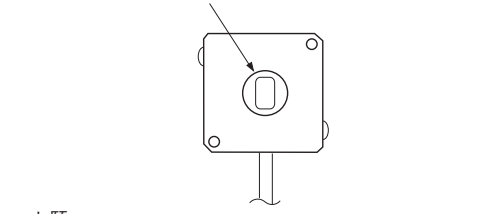


温度センサ部 (形ES2-THB-Nのみ)



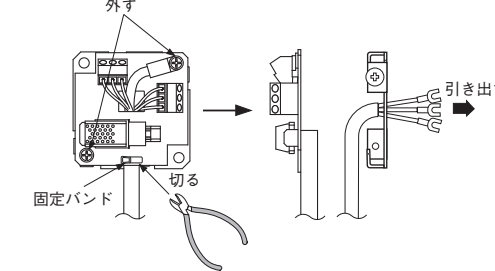
背面引き出しについて

ケーブルは背面の導入口から取り出せます。手順は次のとおりです。

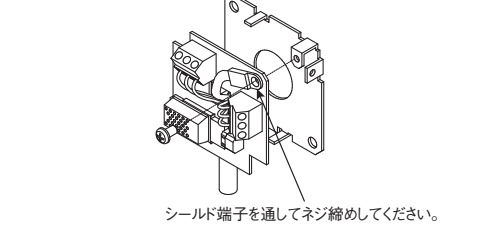


- お願い
端子台の配線を外さないでください。
固定バンド切断時にケーブルを傷つけないようにしてください。

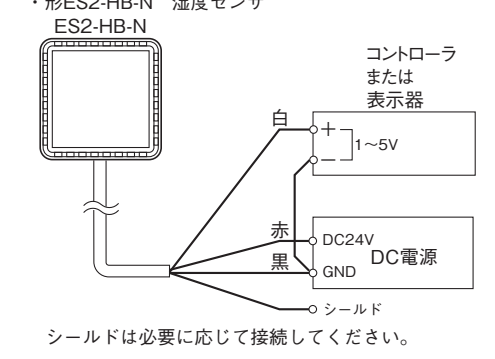
- (1) 固定バンドを切断します。
(2) 2カ所のネジを外します。
(3) 導入口からケーブルを引き出します。



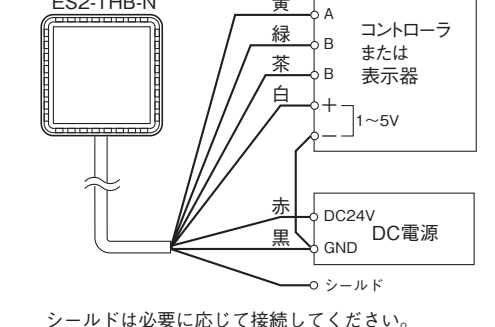
- (4) ネジで基板を固定します。
ネジは、締付トルクが0.49~0.59N・m [5.0~6.0kgf・cm]で締めてください。



接続例



形ES2-THB-N 温湿度センサ



ご承諾事項

当社商品は、一般工業製品向けの汎用品として設計製造されています。従いまして、次に掲げる用途での使用を意図しておらず、お客様が当社商品をこれらの用途に使用される際には、当社は当社商品に対して一切保証をいたしません。

ケーブルの延長について

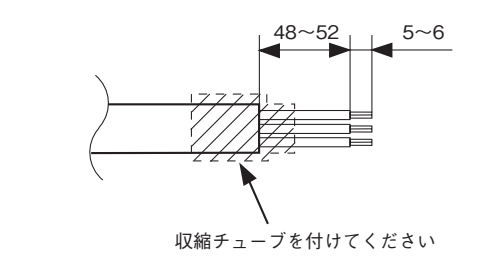
付属のケーブル長で足りない場合は、次の内容に従って別途ケーブルを用意してください。
最大50mまで延長できます。

使用ケーブルの条件

Table with 3 columns: 線径 (Wire diameter), 芯数 (Number of cores), シールド (Shielding), 最大導体抵抗 (20°C) (Max conductor resistance), 仕上がり外径 (Finished outer diameter).

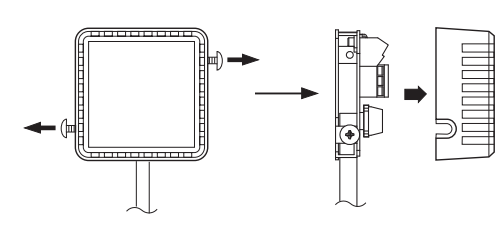
ケーブルの加工

次のようにケーブルを加工してください。
シールド線ははみ出ないように切り取ってください。

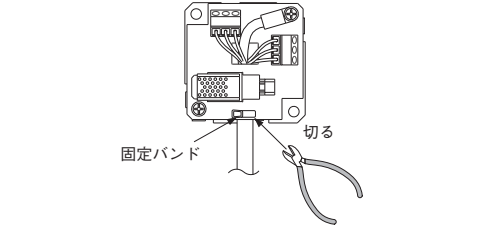


交換手順

- (1) カバーを外します。
側面2カ所のネジをゆるめてください。

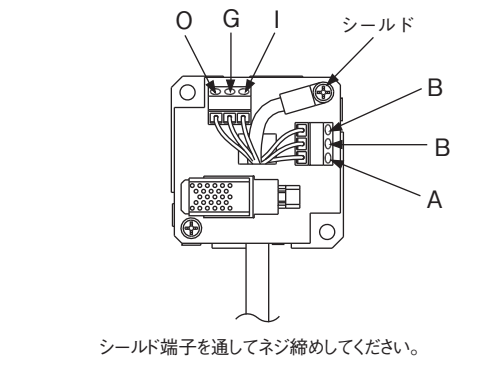


- (2) 固定バンドを切断します。



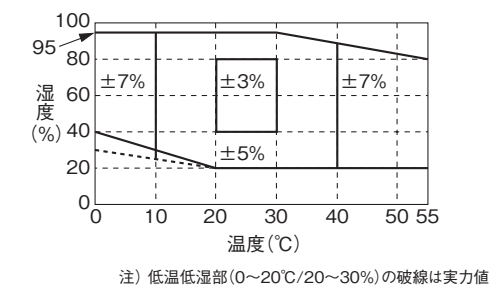
- (3) 付属のケーブルを外します。

- (4) 別途用意したケーブルを配線します。
端子ネジは、締付トルクが0.27~0.33N・m [2.8~3.4kgf・cm]で締めてください。



- (5) ケーブルを側面から引き出す場合は、固定バンドで固定してください。背面から引き出す場合は、ケーブルを背面の導入口から入れて配線してください。

湿度測定範囲と検出精度



注) 低温低湿度(0~20°C/20~30%)の破線は実力値

オムロン株式会社
製品に関するお問い合わせ先
お客様相談室
電話 0120-919-066
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