

WT100-2 with background suppression

Miniature photoelectric sensor

en / de / fr / pt / it / es / zh / ja / ru



**Photoelectric proximity sensor
Operating instructions**

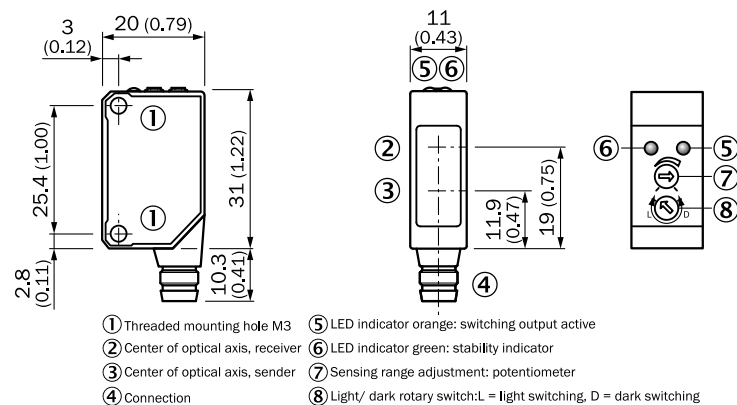
2 Safety notes

- Read the operating instructions before commissioning.
- Connection, mounting, and setting may only be performed by trained specialists.
- Not a safety component in accordance with the EU Machinery Directive.
- When commissioning, protect the device from moisture and contamination.
- These operating instructions contain information required during the life cycle of the sensor.

3 Correct use

The WT100-2 is an opto-electronic photoelectric proximity sensor (referred to as "sensor" in the following) for the optical, non-contact detection of objects, animals, and persons. If the product is used for any other purpose or modified in any way, any warranty claim against SICK AG shall become void.

Photoelectric proximity sensor with background suppression



4 Commissioning

- 1 Check the application conditions: Adjust the sensing range and distance to the object or background and the remission capability of the object according to the corresponding diagram [H] (x = sensing range, y = transition range between the set sensing range and suppression of the background as a % of the sensing range (object remission/background remission). Remission: 6% = black, 18% = gray, 90% = white (referring to standard white as per DIN 5033).
The minimum distance (= y) for background suppression can be determined from diagram [H] as follows:
Example: x = 50 mm, y = 30 % => 30 % of 50 mm = 15 mm. That is, the background is suppressed at a distance of > 65 mm from the sensor.

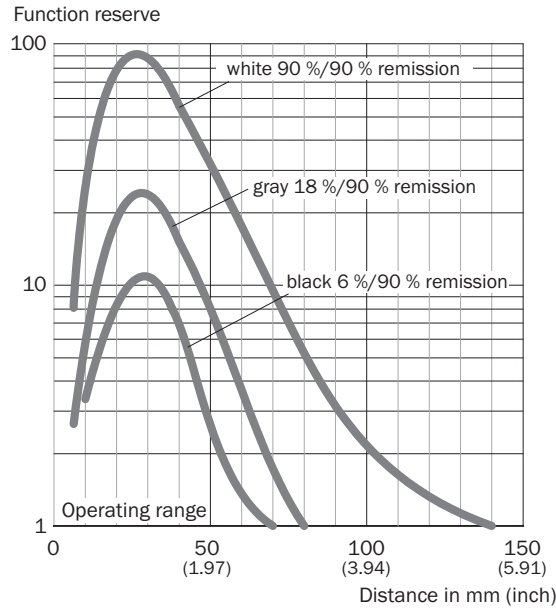


Image 1: H

- 2 Mount the sensor using a suitable mounting bracket (see the SICK range of accessories).
Note the sensor's maximum permissible tightening torque of < 0.5 Nm.
Note the preferred direction of the object relative to the sensor.
- 3 The sensors must be connected in a voltage-free state ($V_S = 0\text{ V}$). The information in the graphics [B] must be observed, depending on the type of connection:
 - Male connector connection: pin assignment
 - Cable: core color

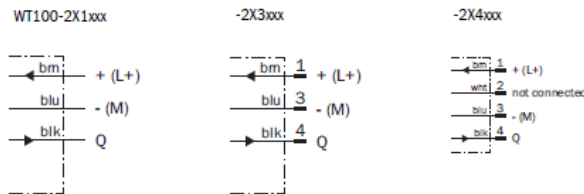


Image 2: B

Only apply voltage/switch on the power supply ($V_S > 0\text{ V}$) once all electrical connections have been completed. The green LED indicator lights up on the sensor.

Explanations of the connection diagram (Graphic B):

Switching output Q (according to Graphic B):

WT100-2P (PNP: load -> M)

WT100-2N (NPN: load -> L+)

L = light switching

D = dark-switching

- 4 Align the sensor with the object. Select the position so that the red emitted light beam hits the center of the object. You must ensure that the optical opening (front screen) of the sensor is completely clear [E]. We recommend making the adjustments using an object with a low remission.

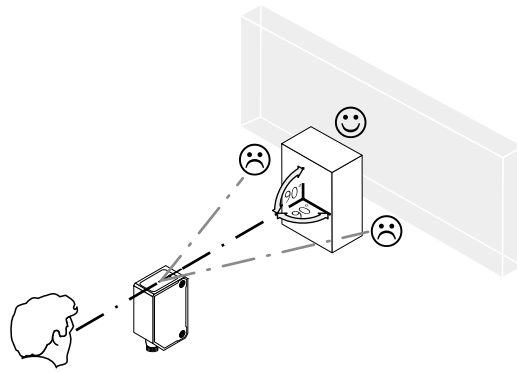
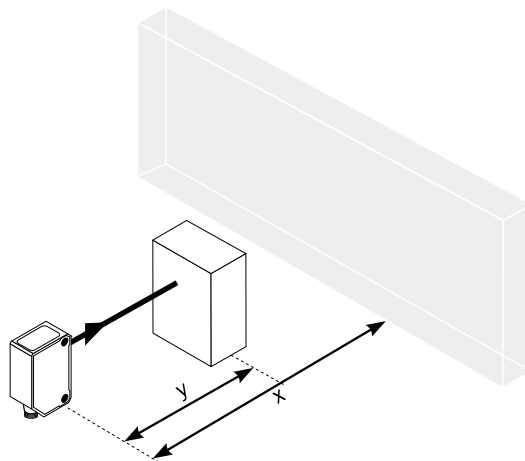


Image 3: E

5



Sensor with potentiometer:

The sensing range is adjusted with the potentiometer (type: 270°). Clockwise rotation: sensing range increased; counterclockwise rotation: sensing range reduced. We recommend placing the switching state in the object, e.g., see Graphic F. Once the sensing range has been adjusted, the object is removed from the path of the beam, which causes the background to be suppressed and the switching output to change (see Graphic C).

The sensor is adjusted and ready for operation. Refer to Graphics C and G to check the function. If the switching output fails to behave in accordance with Graphic C, check application conditions. See section Fault diagnosis.

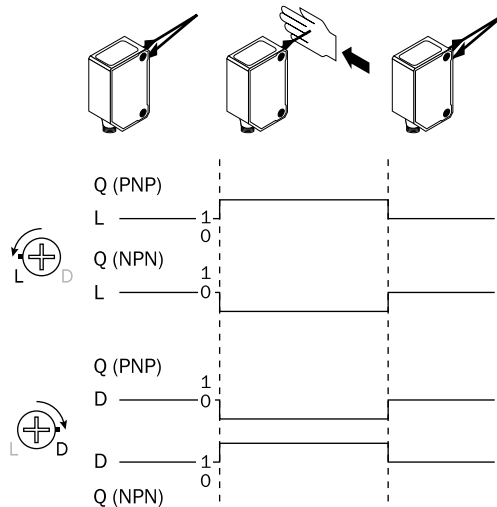


Image 4: C

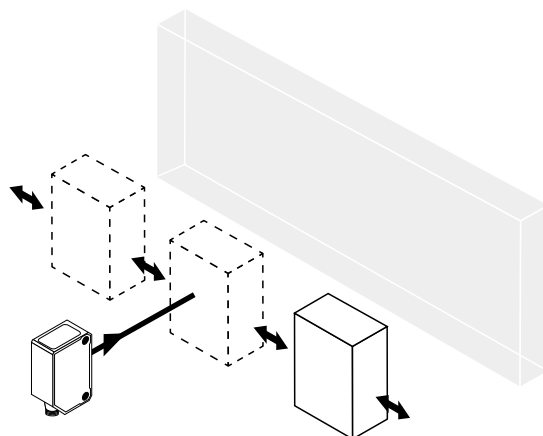


Image 5: G

6 Fault diagnosis

Table indicates which measures are to be taken if the sensor stops working.

7 Tab_Fault diagnosis

LED indicator/fault pattern / <i>LED indicator/fault pattern</i>	Cause / <i>Cause</i>	Measures / <i>Measures</i>
Green LED does not light up or flickers / <i>Green LED does not light up or flickers</i>	Sensor is still ready for operation, but the operating conditions are not ideal (operating reserve factor between 0.9 and 1.1) / <i>Sensor is still ready for operation, but the operating conditions are not ideal (operating reserve factor between 0.9 and 1.1)</i>	Check the operating conditions: Fully align the beam of light (light spot) with the object. / Clean the optical surfaces / Readjust the sensitivity (potentiometer) / Check sensing range and adjust if necessary, see Graphic E / <i>Check the operating conditions: Fully align the beam of light (light spot) with the object. / Clean the optical surfaces / Readjust the sensitivity (potentiometer) / Check sensing range and adjust if necessary, see Graphic E</i>
Green LED does not light up / <i>Green LED does not light up</i>	No voltage or voltage below the limit values / <i>No voltage or voltage below the limit values</i>	Check the power supply, check all electrical connections (cables and plug connections) / <i>Check the power supply, check all electrical connections (cables and plug connections)</i>
Green LED does not light up / <i>Green LED does not light up</i>	Voltage interruptions / <i>Voltage interruptions</i>	Ensure there is a stable power supply without interruptions / <i>Ensure there is a stable power supply without interruptions</i>
Green LED does not light up / <i>Green LED does not light up</i>	Sensor is faulty / <i>Sensor is faulty</i>	If the power supply is OK, replace the sensor / <i>If the power supply is OK, replace the sensor</i>
Yellow LED lights up, no object in the path of the beam / <i>Yellow LED lights up, no object in the path of the beam</i>	/ Distance between the sensor and the background is too short / <i>/ Distance between the sensor and the background is too short</i>	Reduce the sensing range, see Graphic F / <i>Reduce the sensing range, see Graphic F</i>

LED indicator/fault pattern / LED indicator/fault pattern	Cause / Cause	Measures / Measures
Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam / Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam	/ Distance between the sensor and the background is too short / / Distance between the sensor and the background is too short	Reduce the sensing range, see Graphic F / Reduce the sensing range, see Graphic F
Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam / Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam	Sensitivity is set too low or distance between the sensor and the object is too long / Sensitivity is set too low or distance between the sensor and the object is too long	Increase the sensing range, take note of the distance between the sensor and the background, see Graphic E / Increase the sensing range, take note of the distance between the sensor and the background, see Graphic E

8 Disassembly and disposal

The sensor must be disposed of according to the applicable country-specific regulations. Efforts should be made during the disposal process to recycle the constituent materials (particularly precious metals).

9 Maintenance

SICK sensors are maintenance-free.

We recommend doing the following regularly:

- Clean the external lens surfaces
- Check the screw connections and plug-in connections

No modifications may be made to devices.

Subject to change without notice. Specified product properties and technical data are not written guarantees.

Reflexions-Lichttaster Betriebsanleitung

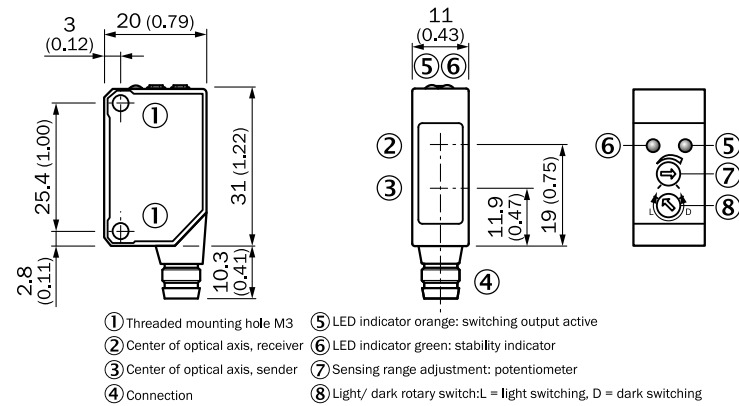
12 Sicherheitshinweise

- Vor der Inbetriebnahme die Betriebsanleitung lesen.
- Anschluss, Montage und Einstellung nur durch Fachpersonal.
- Kein Sicherheitsbauteil gemäß EU-Maschinenrichtlinie.
- Gerät bei Inbetriebnahme vor Feuchte und Verunreinigung schützen.
- Diese Betriebsanleitung enthält Informationen, die während des Lebenszyklus des Sensors notwendig sind.

13 Bestimmungsgemäße Verwendung

Die WT100-2 ist ein optoelektronischer Reflexions-Lichttaster (im Folgenden Sensor genannt) und wird zum optischen, berührungslosen Erfassen von Sachen, Tieren und Personen eingesetzt. Bei jeder anderen Verwendung und bei Veränderungen am Produkt verfällt jeglicher Gewährleistungsanspruch gegenüber der SICK AG.

Reflexionslichttaster mit Hintergrundausbldung



14 Inbetriebnahme

- 1 Einsatzbedingungen prüfen: Schaltabstand und Distanz zum Objekt bzw. Hintergrund sowie Remissionsvermögen des Objektes mit dem zugehörigen Diagramm [vgl. H] abgleichen (x = Schaltabstand, y = Übergangsbereich zwischen eingestelltem Schaltabstand und Ausblendung des Hintergrundes in % des Schaltabstands (Remission Objekt / Remission Hintergrund)). Remission: 6 % = schwarz, 18 % = grau, 90 % = weiß (bezogen auf Standardweiß nach DIN 5033).

Die minimale Distanz (= y) für die Hintergrundausbldung kann aus dem Diagramm [vgl. H] wie folgt ermittelt werden:

Beispiel: x = 50 mm, y = 30 % => 30 % von 50 mm = 15 mm. D. h. der Hintergrund wird ab einer Distanz von > 65 mm vom Sensor ausgeblendet.

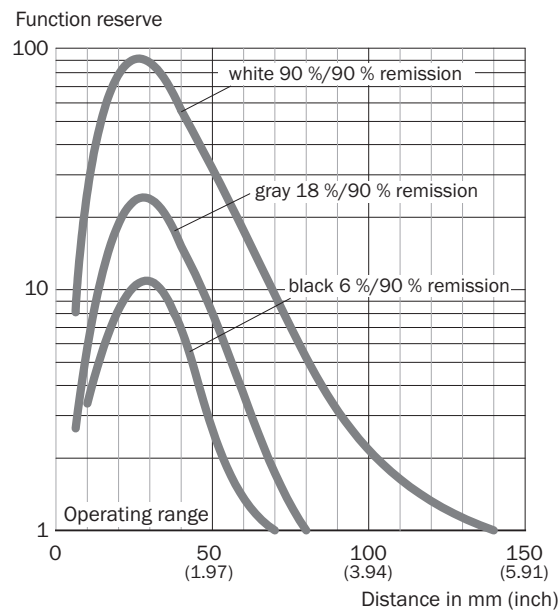


Abb. 6: H

- 2 Den Sensor an einen geeigneten Befestigungswinkel montieren (siehe SICK-Zubehör-Programm).

Maximal zulässiges Anzugsdrehmoment des Sensors von < 0.5 Nm beachten.

Vorzugsrichtung des Objektes zum Sensor beachten [vgl. A].

3 Anschluss der Sensoren muss spannungsfrei ($V_S = 0\text{ V}$) erfolgen. Je nach Anschlussart sind die Informationen in den Grafiken [vgl. B] zu beachten:

- Steckeranschluss: Pinbelegung
- Leitung: Adernfarbe

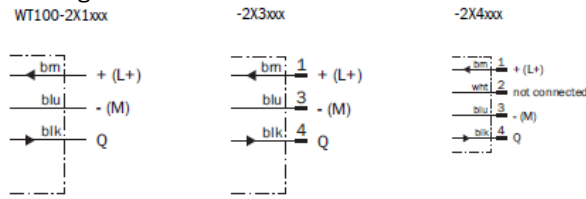


Abb. 7: B

Erst nach Anschluss aller elektrischen Verbindungen die Spannungsversorgung ($V_S > 0\text{ V}$) anlegen bzw. einschalten. Am Sensor leuchtet die grüne Anzeige-LED.

Erläuterungen zum Anschlussschema (Grafik B):

Schaltausgang Q (gemäß Grafik B):

WT100-2P (PNP: Last -> M)

WT100-2N (NPN: Last -> L+)

L = hellerschaltend

D = dunkelschaltend

4 Sensor auf Objekt ausrichten. Positionierung so wählen, dass der rote Sendelichtstrahl in der Mitte des Objekts auftrifft. Es ist darauf zu achten, dass die optische Öffnung (Frontscheibe) des Sensors vollständig frei ist [vgl. E]. Wir empfehlen, die Einstellung mit einem Objekt von niedriger Remission vorzunehmen.

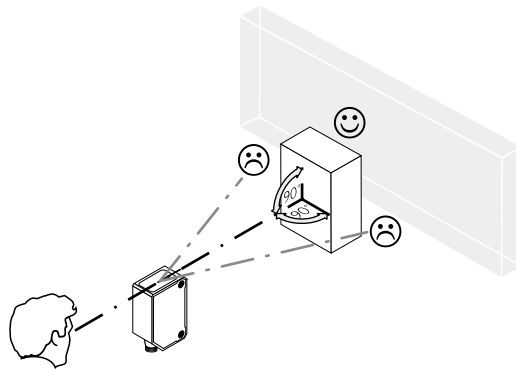
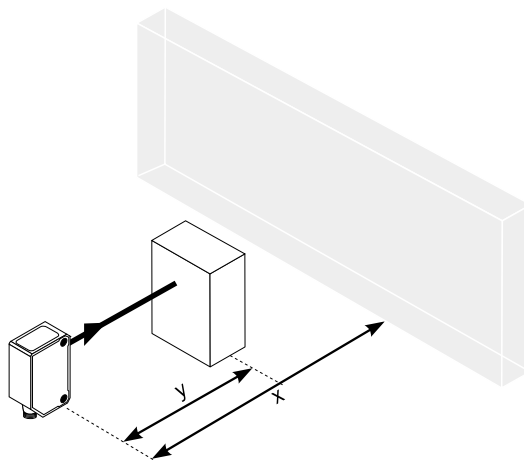


Abb. 8: E

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Sensor mit Potentiometer:

Mit dem Potentiometer (Art: 270°) wird der Schaltabstand eingestellt. Drehung nach rechts: Erhöhung des Schaltabstandes, Drehung nach links: Verringerung des Schaltabstandes. Wir empfehlen, den Schaltabstand in das Objekt zu legen, z.B. siehe Grafik F. Nachdem der Schaltabstand eingestellt worden ist, das Objekt aus dem Strahlengang entfernen, der Hintergrund wird dabei ausgeblendet und der Schaltausgang ändert sich (siehe Grafik C).

Sensor ist eingestellt und betriebsbereit. Zur Überprüfung der Funktion Grafik C und G heranziehen. Verhält sich der Schaltausgang nicht gemäß Grafik C, Einsatzbedingungen prüfen. Siehe Abschnitt Fehlerdiagnose.

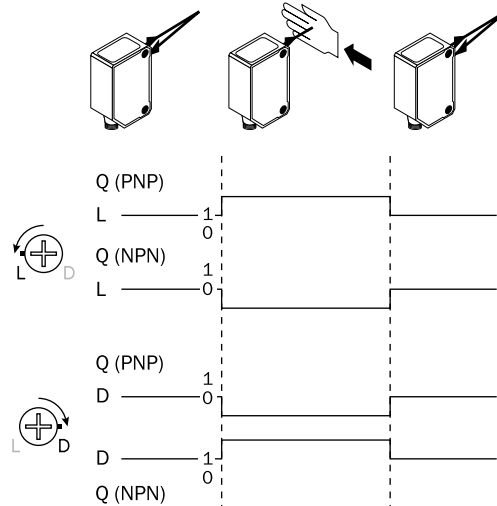


Abb. 9: C

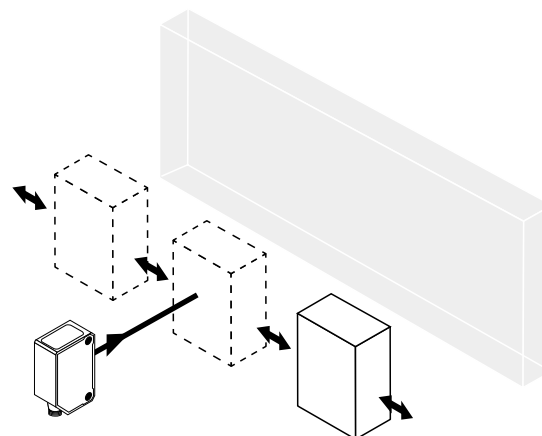


Abb. 10: G

16 Fehlerdiagnose

Tabelle I zeigt, welche Maßnahmen durchzuführen sind, wenn die Funktion des Sensors nicht mehr gegeben ist.

17 Tab_Fehlerdiagnose

Anzeige-LED / Fehlerbild / LED indicator/fault pattern	Ursache / Cause	Maßnahme / Measures
Grüne LED leuchtet nicht bzw. flackert / Green LED does not light up or flickers	Sensor ist noch betriebsbereit, aber die Betriebsbedingungen sind nicht optimal (Funktionsreservefaktor zwischen 0,9 und 1,1) / Sensor is still ready for operation, but the operating conditions are not ideal (operating reserve factor between 0.9 and 1.1)	Betriebsbedingungen prüfen: Lichtstrahl (Lichtfleck) vollständig auf das Objekt ausrichten / Reinigung der optischen Flächen / Empfindlichkeit (Potentiometer) neu einstellen / Schaltabstand überprüfen und ggf. anpassen, siehe Grafik F. / Check the operating conditions: Fully align the beam of light (light spot) with the object. / Clean the optical surfaces. / Readjust the sensitivity (potentiometer) / Check sensing range and adjust if necessary; see Graphic F.
grüne LED leuchtet nicht / Green LED does not light up	keine Spannung oder Spannung unterhalb der Grenzwerte / No voltage or voltage below the limit values	Spannungsversorgung prüfen, den gesamten elektrischen Anschluss prüfen (Leitungen und Steckerverbindungen) / Check the power supply, check all electrical connections (cables and plug connections)
grüne LED leuchtet nicht / Green LED does not light up	Spannungsunterbrechungen / Voltage interruptions	Sicherstellen einer stabilen Spannungsversorgung ohne Unterbrechungen / Ensure there is a stable power supply without interruptions
grüne LED leuchtet nicht / Green LED does not light up	Sensor ist defekt / Sensor is faulty	Wenn Spannungsversorgung in Ordnung ist, dann Sensor austauschen / If the power supply is OK, replace the sensor
gelbe LED leuchtet, kein Objekt im Strahlengang / Yellow LED lights up, no object in the path of the beam	Abstand zwischen Sensor und Hintergrund ist zu gering / / Distance between the sensor and the background is too short	Schaltabstand verringern, siehe Grafik F / Reduce the sensing range, see Graphic F
Gelbe LED leuchtet nicht (gilt für hellschaltende Geräte), bzw. gelbe LED leuchtet (gilt für dunkelschaltende Geräte), Objekt ist im Strahlengang / Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam	Abstand zwischen Sensor und Hintergrund ist zu gering / / Distance between the sensor and the background is too short	Schaltabstand verringern, siehe Grafik F / Reduce the sensing range, see Graphic F
Gelbe LED leuchtet nicht (gilt für hellschaltende Geräte), bzw. gelbe LED leuchtet (gilt für dunkelschaltende Geräte), Objekt ist im Strahlengang / Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam	Empfindlichkeit ist zu gering eingestellt oder Abstand zwischen Sensor und Objekt ist zu groß / Sensitivity is set too low or distance between the sensor and the object is too long	Schaltabstand vergrößern, Abstand zwischen Sensor und Hintergrund beachten, siehe Grafik F / Increase the sensing range, take note of the distance between the sensor and the background, see Graphic F

18 Demontage und Entsorgung

Die Entsorgung des Sensors hat gemäß den länderspezifisch anwendbaren Vorschriften zu erfolgen. Für die enthaltenen Wertstoffe (insbesondere Edelmetalle) ist im Rahmen der Entsorgung eine Verwertung anzustreben.

19 Wartung

SICK-Sensoren sind wartungsfrei.

Wir empfehlen, in regelmäßigen Abständen

- die optischen Grenzflächen zu reinigen
- Verschraubungen und Steckverbindungen zu überprüfen

Veränderungen an Geräten dürfen nicht vorgenommen werden.

Irrtümer und Änderungen vorbehalten. Angegebene Produkteigenschaften und technische Daten stellen keine Garantieerklärung dar.

Détecteur à réflexion directe Notice d'instruction

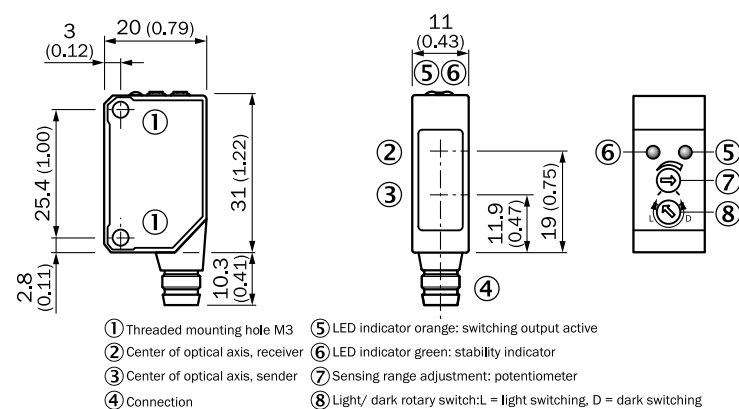
22 Consignes de sécurité

- Lire la notice d'instruction avant la mise en service.
- Confier le raccordement, le montage et le réglage uniquement à un personnel spécialisé.
- Il ne s'agit pas d'un composant de sécurité au sens de la directive machines CE.
- Protéger l'appareil contre l'humidité et les impuretés lors de la mise en service.
- Cette notice d'instruction contient des informations nécessaires pendant toute la durée de vie du capteur.

23 Utilisation conforme

WT100-2 est un détecteur à réflexion directe optoélectronique (appelé capteur dans ce document) qui permet la détection optique sans contact d'objets, d'animaux et de personnes. Toute autre utilisation ou modification du produit annule la garantie de SICK AG.

Détecteur à réflexion directe avec élimination d'arrière-plan



24 Mise en service

- Vérifier les conditions d'utilisation : comparer la portée et la distance à l'objet ou à l'arrière-plan et les caractéristiques de réflectivité avec le diagramme correspondant [cf. H] (x = portée, y = zone de transition entre la portée réglée et le masquage de l'arrière-plan en % de la portée (réflectivité de l'objet / réflectivité de l'arrière-plan)). Réflectivité : 6 % = noir, 18 % = gris, 90 % = blanc (par rapport au blanc standard selon DIN 5033).
La distance minimale (=y) pour l'élimination d'arrière-plan peut être calculée à partir du diagramme [E] comme suit :
Exemple : x = 50 mm, y = 30 % => 30 % de 50 mm = 15 mm. C'est à dire que l'arrière-plan est masqué à partir d'une distance du capteur > 65 .

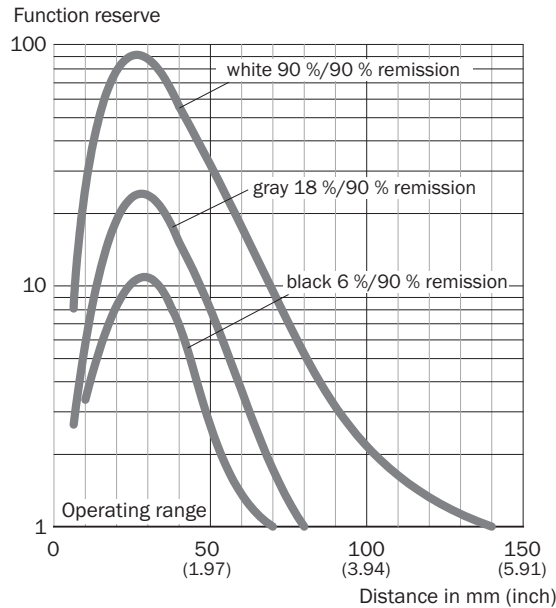


Image 11: H

- Monter le capteur sur une équerre de fixation adaptée (voir la gamme d'accessoires SICK).
Respecter le couple de serrage maximum autorisé du capteur de < 0.5 Nm
Tenir compte de la direction préférentielle de l'objet par rapport au capteur [voir A].
- Le raccordement des capteurs doit s'effectuer hors tension ($V_S = 0$ V). Selon le mode de raccordement, respecter les informations contenues dans les schémas [B] :

- Raccordement du connecteur : affectation des broches

- Câble : couleur des fils

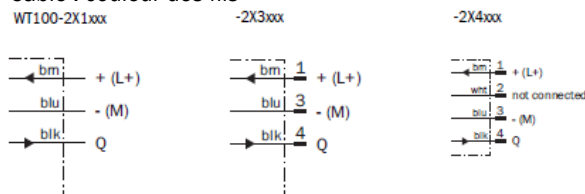


Image 12: B

Après avoir terminé tous les raccordements électriques, enclencher l'alimentation électrique ($V_S > 0$ V). La DEL verte s'allume sur le capteur.

Explications relatives au schéma de raccordement (schéma B) :

Sortie de commutation Q (selon le schéma B) :

WT100-2P (PNP : charge -> M)

WT100-2N (NPN : charge -> L+)

L = commutation claire

D = commutation sombre

- 4 Aligner le capteur sur l'objet. Sélectionner la position de sorte que le faisceau lumineux émis rouge touche l'objet en plein milieu. S'assurer que l'ouverture optique (vitre frontale) du capteur est parfaitement dégagée [voir E]. Nous recommandons de procéder au réglage avec un objet peu réfléchissant.

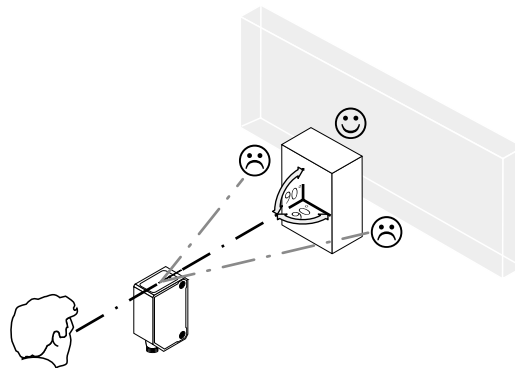
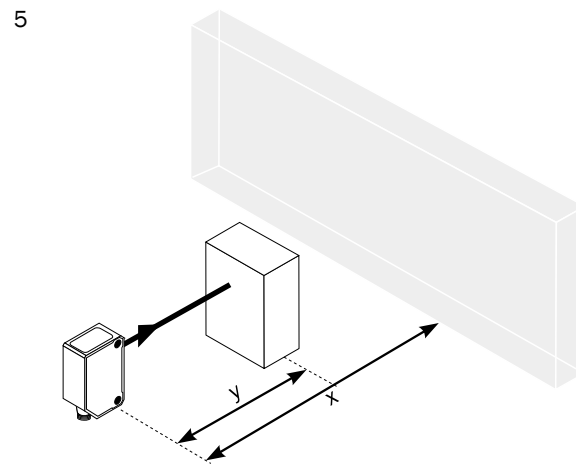


Image 13: E



Capteur avec potentiomètre :

La portée se règle avec le potentiomètre (réf. : 270°). Rotation vers la droite : augmentation de la portée, rotation vers la gauche : réduction de la portée. Nous recommandons de régler la portée sur l'objet, par ex. voir schéma F. Après le réglage de la portée, retirer l'objet de la trajectoire du faisceau, ce qui élimine l'arrière-plan et fait basculer la sortie de commutation (voir le schéma C).

Le capteur est réglé et prêt à être utilisé. Pour contrôler le fonctionnement, utiliser les schémas C et G. Si la sortie de commutation ne se comporte pas comme indiqué sur le schéma C, vérifier les conditions d'utilisation. Voir la section consacrée au diagnostic.

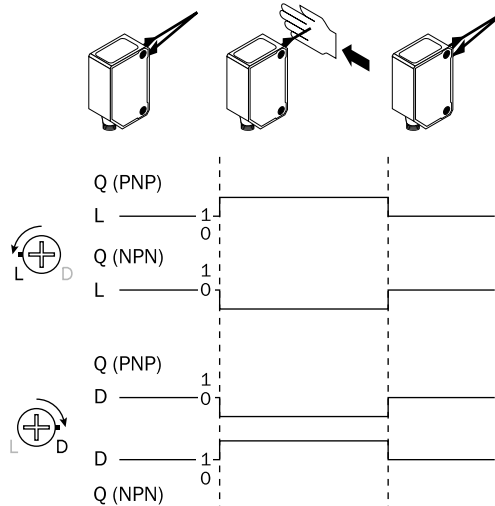


Image 14: C

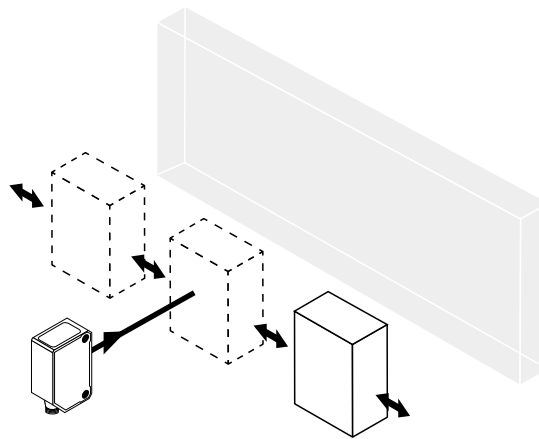


Image 15: G

26 Diagnostic

Le tableau I présente les mesures à appliquer si le capteur ne fonctionne plus.

27 Tab_Diagnostic

LED d'état / image du défaut / LED indicator/fault pattern	Cause / Cause	Mesure / Measures
La LED verte ne s'allume pas ou vacille / Green LED does not light up or flickers	Le capteur est encore opérationnel, mais les conditions d'utilisation ne sont pas idéales (facteur de réserve de fonctionnement entre 0,9 et 1,1) / Sensor is still ready for operation, but the operating conditions are not ideal (operating reserve factor between 0.9 and 1.1)	Vérifier les conditions d'utilisation : Diriger le faisceau lumineux (spot lumineux) entièrement sur l'objet / Nettoyage des surfaces optiques / Régler à nouveau la sensibilité (potentiomètre) / Contrôler la portée et éventuellement l'adapter, voir le schéma E / Check the operating conditions: Fully align the beam of light (light spot) with the object. / Clean the optical surfaces / Readjust the sensitivity (potentiometer) / Check sensing range and adjust if necessary, see Graphic E

LED d'état / image du défaut / LED indicator/fault pattern	Cause / Cause	Mesure / Measures
La LED verte ne s'allume pas / Green LED does not light up	Pas de tension ou tension inférieure aux valeurs limites / No voltage or voltage below the limit values	Contrôler l'alimentation électrique, contrôler tous les branchements électriques (câbles et connexions) / Check the power supply, check all electrical connections (cables and plug connections)
La LED verte ne s'allume pas / Green LED does not light up	Coupures d'alimentation électrique / Voltage interruptions	S'assurer que l'alimentation électrique est stable et ininterrompue / Ensure there is a stable power supply without interruptions
La LED verte ne s'allume pas / Green LED does not light up	Le capteur est défectueux / Sensor is faulty	Si l'alimentation électrique est en bon état, remplacer le capteur / If the power supply is OK, replace the sensor
La LED jaune s'allume, pas d'objet dans la trajectoire du faisceau / Yellow LED lights up, no object in the path of the beam	La distance entre le capteur et l'arrière-plan est trop faible / / Distance between the sensor and the background is too short	Réduire la portée, voir le schéma F / Reduce the sensing range, see Graphic F
La LED jaune ne s'allume pas (valable pour les appareils à commutation claire) ou la LED jaune s'allume (valable pour les appareils à commutation sombre), un objet se trouve dans la trajectoire du faisceau / Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam	La distance entre le capteur et l'arrière-plan est trop faible / / Distance between the sensor and the background is too short	Réduire la portée, voir le schéma F / Reduce the sensing range, see Graphic F
La LED jaune ne s'allume pas (valable pour les appareils à commutation claire) ou la LED jaune s'allume (valable pour les appareils à commutation sombre), un objet se trouve dans la trajectoire du faisceau / Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam	La sensibilité est trop faible ou la distance entre le capteur et l'objet est trop grande / Sensitivity is set too low or distance between the sensor and the object is too long	Augmenter la portée, tenir compte de la distance entre le capteur et l'arrière-plan, voir le schéma E / Increase the sensing range, take note of the distance between the sensor and the background, see Graphic E

28 Démontage et mise au rebut

La mise au rebut du capteur doit respecter la réglementation nationale en vigueur. Dans le cadre de la mise au rebut, veiller à recycler les matériaux (notamment les métaux précieux).

29 Maintenance

Les capteurs SICK ne nécessitent aucune maintenance.

Nous vous recommandons de procéder régulièrement

- au nettoyage des surfaces optiques
- au contrôle des vissages et des connexions enfichables

Ne procéder à aucune modification sur les appareils.

Sujet à modification sans préavis. Les caractéristiques du produit et techniques fournies ne sont pas une déclaration de garantie.

Interruptor fotoelétrico de reflexão
Manual de instruções

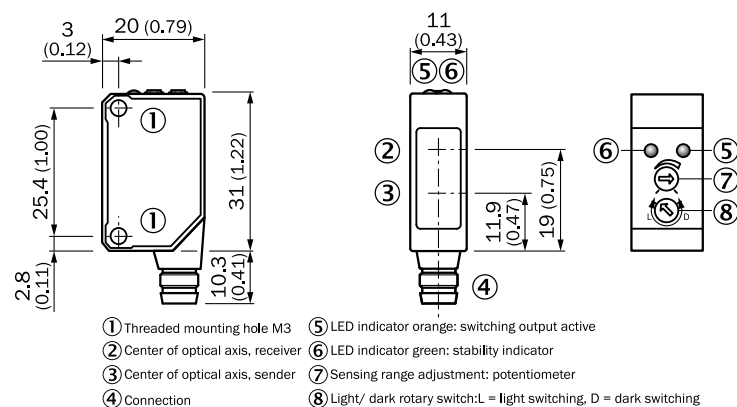
32 Notas de segurança

- Ler as instruções de operação antes da colocação em funcionamento.
- A conexão, a montagem e o ajuste devem ser executados somente por pessoal técnico qualificado.
- Os componentes de segurança não se encontram em conformidade com a Diretiva Europeia de Máquinas.
- Durante o funcionamento, manter o aparelho protegido contra impurezas e umidade.
- Este manual de instruções contém informações necessárias para toda a vida útil do sensor.

33 Especificações de uso

O WT100-2 é um sensor fotoelétrico de proximidade utilizado para a detecção óptica, sem contato, de objetos, animais e pessoas. Qualquer utilização diferente ou alterações do produto provocam a perda da garantia da SICK AG.

Sensor de luz de reflexão com supressão de fundo



34 Colocação em funcionamento

- 1 Verificar as condições de uso: equiparar a distância de comutação e distância até o objeto ou plano de fundo, bem como a refletividade do objeto, com o respectivo diagrama [cp. H] (x = distância de comutação, y = área de transição entre a distância de comutação ajustada e a supressão do fundo em % da distância de comutação (luminância do objeto /luminância do fundo)). Luminância: 6% = preto, 18% = cinza, 90% =branco (com base no padrão branco da norma DIN 5033).

A distância mínima (= y) para a supressão de fundo pode ser determinada com base no diagrama [cp. H] como a seguir:

exemplo: x = 50 mm, y = 30 % => 30 % de 50 mm = 15 mm. Isto significa, que o sensor suprime o plano de fundo a partir de uma distância > 65 mm.

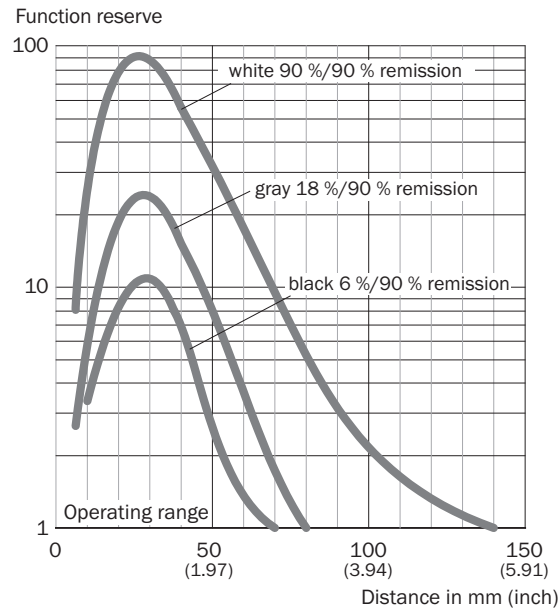


Image 16: H

- 2 Montar o sensor numa cantoneira de fixação adequada (ver linha de acessórios da SICK). Observar o torque de aperto máximo permitido de <math>< 0.5\text{ Nm}</math> para o sensor. Observar a direção preferencial do objeto em relação ao sensor [cp. A].
- 3 A conexão dos sensores deve ser realizada em estado desenergizado ($V_S = 0\text{ V}$). Conforme o tipo de conexão, devem ser observadas as informações contidas nos gráficos [cp. B]:

- Conector: Pin-out
- Cabo: Cor dos fios

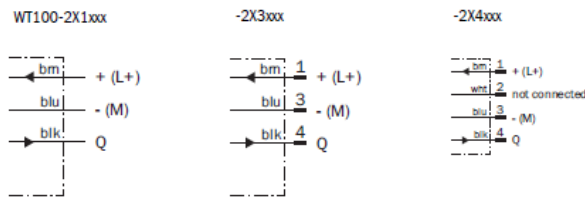


Image 17: B

Instalar ou ligar a alimentação de tensão ($V_S > 0\text{ V}$) somente após a conclusão de todas as conexões elétricas. O indicador LED verde está aceso no sensor.

Explicações relativas ao esquema de conexões (Gráfico B):

Saída de comutação Q (conforme o gráfico B):

WT100-2P (PNP: carga -> M)

WT100-2N (NPN: carga -> L+)

L = comutação por luz

D = comutação por sombra

- 4 Alinhar o sensor ao objeto. Posicionar, de forma que o feixe da luz de emissão vermelha incida sobre o centro do objeto. Certificar-se de que a abertura óptica (vidro frontal) do sensor esteja completamente livre [cp. E]. Recomendamos efetuar o ajuste com um objeto de baixa luminância.

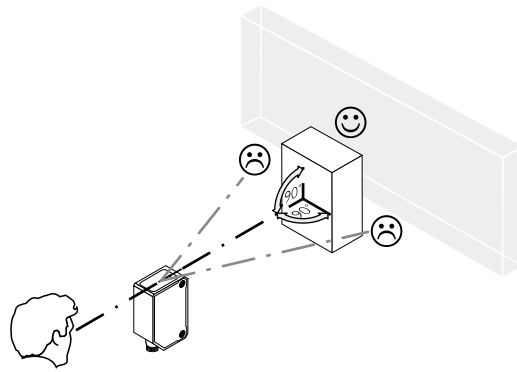
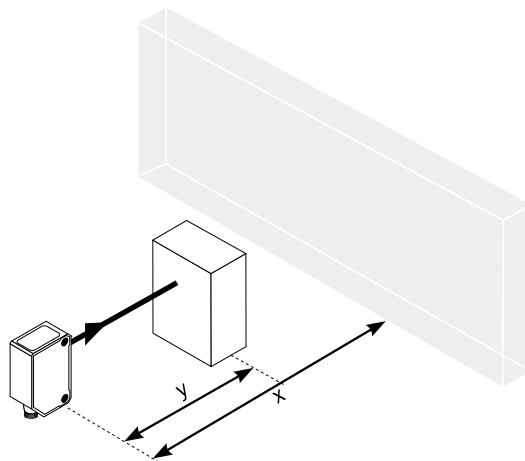


Image 18: E

5



Sensor com potenciômetro:

A distância de comutação é ajustada com o potenciômetro (tipo: 270°). Giro para direita: aumento da distância de comutação; giro para esquerda: redução da distância de comutação. Recomendamos posicionar a distância de comutação no objeto, por ex., como no gráfico F. Após o ajuste da distância de comutação, o objeto é removido do caminho óptico, o fundo é suprimido e a saída de comutação se altera (ver gráfico C).

O sensor está ajustado e operacional. Utilizar os gráficos C e G para verificar o funcionamento. Se a saída de comutação não se comportar de acordo com o gráfico C, verificar as condições de uso. Ver seção Diagnóstico de erros.

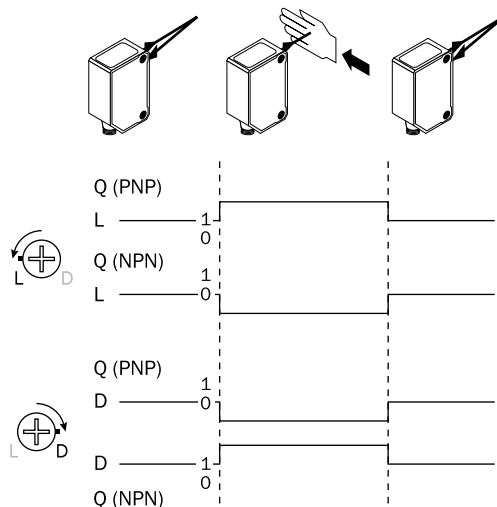


Image 19: C

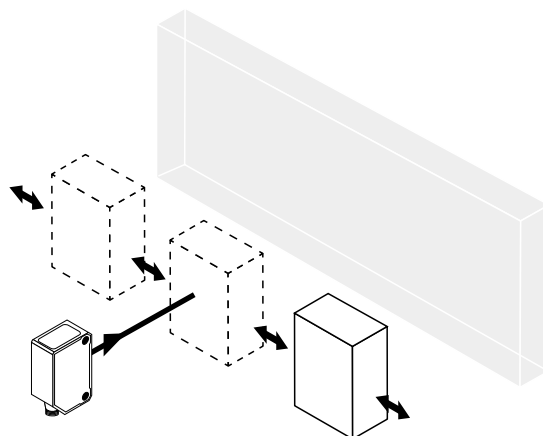


Image 20: G

36 Diagnóstico de erros

A tabela I mostra as medidas a serem executadas, quando o sensor não estiver funcionando.

37 Tab_Diagnóstico de erros

Indicador LED / padrão de erro / LED indicator/fault pattern	Causa / Cause	Medida / Measures
LED verde apagado ou tremulando / Green LED does not light up or flickers	Sensor ainda está operacional, mas as condições de operação não são ideais (fator de reserva de função entre 0,9 e 1,1) / Sensor is still ready for operation, but the operating conditions are not ideal (operating reserve factor between 0.9 and 1.1)	Verificar as condições de operação: Alinhar o feixe de luz (ponto de luz) completamente ao objeto / Limpeza das superfícies ópticas / reajustar a sensibilidade (potenciômetro) / Verificar e, se necessário, adaptar a distância de comutação, ver gráfico E / Check the operating conditions: Fully align the beam of light (light spot) with the object. / Clean the optical surfaces / Readjust the sensitivity (potentiometer) / Check sensing range and adjust if necessary, see Graphic E
LED verde apagado / Green LED does not light up	Sem tensão ou tensão abaixo dos valores-limite / No voltage or voltage below the limit values	Verificar a alimentação de tensão, verificar toda a conexão elétrica (cabos e conectores) / Check the power supply, check all electrical connections (cables and plug connections)
LED verde apagado / Green LED does not light up	Interrupções de tensão / Voltage interruptions	Assegurar uma alimentação de tensão estável sem interrupções / Ensure there is a stable power supply without interruptions
LED verde apagado / Green LED does not light up	Sensor está com defeito / Sensor is faulty	Se a alimentação de tensão estiver em ordem, substituir o sensor / If the power supply is OK, replace the sensor

Indicador LED / padrão de erro / LED indicator/fault pattern	Causa / Cause	Medida / Measures
LED amarelo aceso, nenhum objeto no caminho óptico / <i>Yellow LED lights up, no object in the path of the beam</i>	Distância entre sensor e fundo é pequena demais / <i>/ Distance between the sensor and the background is too short</i>	Reduzir a distância de comutação, ver gráfico F / <i>Reduce the sensing range, see Graphic F</i>
LED amarelo apagado (válido para dispositivos com comutação por luz) ou LED amarelo aceso (válido para dispositivos com comutação por sombra), objeto está no caminho óptico / <i>Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam</i>	Distância entre sensor e fundo é pequena demais / <i>/ Distance between the sensor and the background is too short</i>	Reduzir a distância de comutação, ver gráfico F / <i>Reduce the sensing range, see Graphic F</i>
LED amarelo apagado (válido para dispositivos com comutação por luz) ou LED amarelo aceso (válido para dispositivos com comutação por sombra), objeto está no caminho óptico / <i>Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam</i>	Sensibilidade foi ajustada para um valor baixo demais ou a distância entre sensor e objeto é grande demais / <i>Sensitivity is set too low or distance between the sensor and the object is too long</i>	Aumentar a distância de comutação, observar a distância entre sensor e fundo, ver gráfico E / <i>Increase the sensing range, take note of the distance between the sensor and the background, see Graphic E</i>

38 Desmontagem e descarte

O descarte do sensor deve ser efetuado de acordo com as normas aplicáveis específicas de cada país. No âmbito do descarte, deve-se procurar o aproveitamento dos materiais recicláveis contidos (principalmente dos metais nobres).

39 Manutenção

Os sensores SICK não requerem manutenção.

Recomendamos que se efetue em intervalos regulares

- uma limpeza das superfícies ópticas
- uma verificação das conexões roscadas e dos conectores

Não são permitidas modificações no aparelho.

Sujeito a alterações sem aviso prévio. As propriedades do produto e os dados técnicos especificados não constituem nenhum certificado de garantia.

Sensore di luce a riflessione Istruzioni per l'uso

42 Avvertenze sulla sicurezza

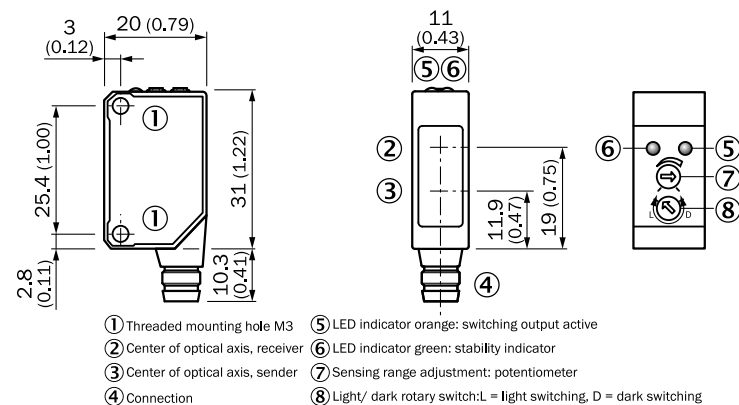
- Prima della messa in funzionamento leggere le istruzioni per l'uso.
- Allacciamento, montaggio e regolazione solo a cura di personale tecnico specializzato.
- Nessun componente di sicurezza ai sensi della direttiva macchine UE.

- Alla messa in funzionamento proteggere l'apparecchio dall'umidità e dalla sporcizia.
- Queste istruzioni per l'uso contengono le informazioni che sono necessarie durante il ciclo di vita del sensore fotoelettrico. deTec4 core

43 Uso conforme alle prescrizioni

La WT100-2 è una fotocellula a riflessione optoelettronica (di seguito nominato sensore) utilizzata per il rilevamento ottico senza contatto di oggetti, animali e persone. Se viene utilizzata diversamente e in caso di modifiche sul prodotto, decade qualsiasi diritto alla garanzia nei confronti di SICK.

Relè fotoelettrico a riflessione con soppressione dello sfondo



44 Messa in funzione

- 1 Controllare le condizioni d'impiego: verificare le condizioni d'impiego: predisporre la distanza di commutazione e la distanza dall'oggetto o dallo sfondo nonché il fattore di riflessione dell'oggetto in base al relativo diagramma [cfr. H] (x = distanza di commutazione, y = area di transizione tra distanza di commutazione impostata e soppressione dello sfondo in % della distanza di commutazione (remissione oggetto/remissione sfondo)). Remissione: 6% = nero, 18% = grigio, 90% = bianco (riferito al bianco standard secondo DIN 5033). La distanza minima (= y) per la soppressione dello sfondo può essere rilevata dal diagramma [cfr. H] come segue:
 Esempio: x = 50 mm, y = 30 % => 30 % di 50 mm = 15 mm. Questo significa che lo sfondo viene soppresso a partire da una distanza > 65 mm dal sensore.

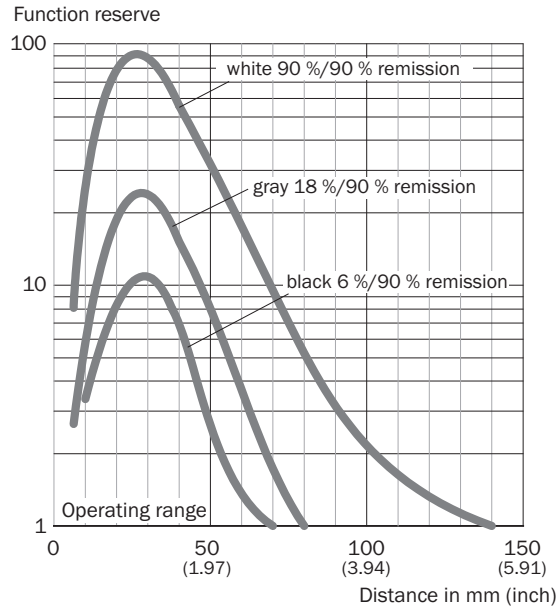


Image 21: H

- 2 Montare il sensore su un punto di fissaggio adatto (vedi il programma per accessori SICK). Rispettare il momento torcente massimo consentito del sensore di < 0.5 Nm. Rispettare la direzione preferenziale dell'oggetto in relazione al sensore [cfr. A].
- 3 Il collegamento dei sensori deve avvenire in assenza di tensione ($V_S = 0\text{ V}$). In base al tipo di collegamento si devono rispettare le informazioni nei grafici [cfr. B]:

- Collegamento a spina: assegnazione pin
- Conduttore: colore filo

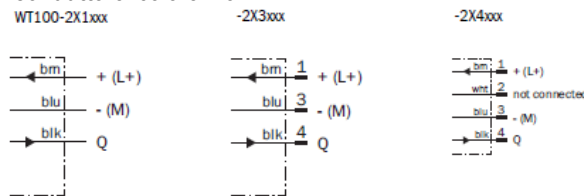


Image 22: B

Solamente in seguito alla conclusione di tutti i collegamenti elettrici, ripristinare o accendere l'alimentazione di tensione ($V_S > 0\text{ V}$). Sul sensore si accende l'indicatore LED verde.

Spiegazioni dello schema di collegamento (grafico B):

Uscita di commutazione Q (conformemente al grafico B):

WT100-2P (PNP: carico -> M)

WT100-2N (NPN: carico -> L+)

L = lampade accese

D = lampade spente

- 4 Orientare il sensore sul rispettivo oggetto. Scegliere la posizione in modo tale che il raggio di luce rosso emesso colpisca il centro dell'oggetto. Fare attenzione affinché l'apertura ottica del sensore (finestrella frontale) sia completamente libera [cfr. E]. Si consiglia di effettuare l'impostazione con un oggetto a bassa riflessione.

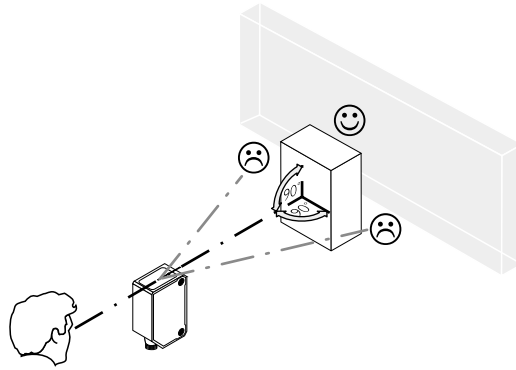
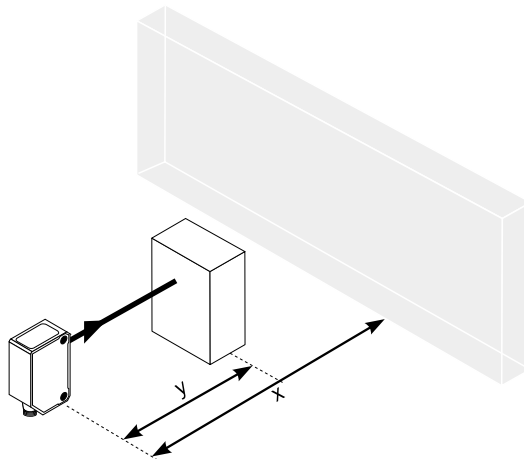


Image 23: E

5



Sensore con potenziometro:

Con il potenziometro (tipo: 270°) viene regolata la distanza di commutazione. Rotazione verso destra: innalzamento della distanza di commutazione, rotazione verso sinistra: riduzione della distanza di commutazione. Si consiglia di fissare la distanza di commutazione nell'oggetto, ad es. vedi grafico F. Dopo l'impostazione della distanza di commutazione, allontanare l'oggetto dalla traiettoria del raggio, lo sfondo viene quindi soppresso e l'uscita di commutazione cambia (vedi grafico C).

Il sensore è impostato e pronto per il funzionamento. Per verificare il funzionamento, osservare i grafici C e G. Se l'uscita di commutazione non si comporta conformemente al grafico C, verificare le condizioni d'impiego. Vedi paragrafo diagnostica delle anomalie.

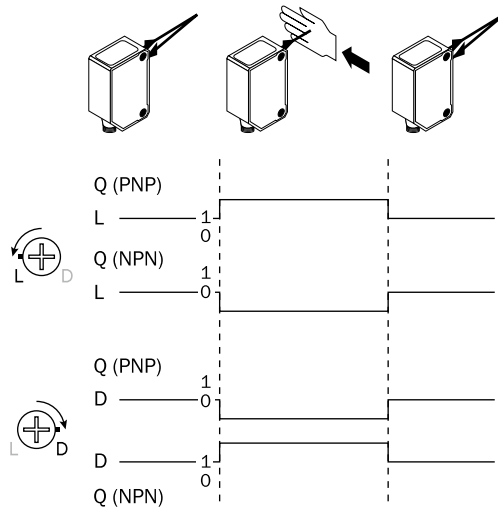


Image 24: C

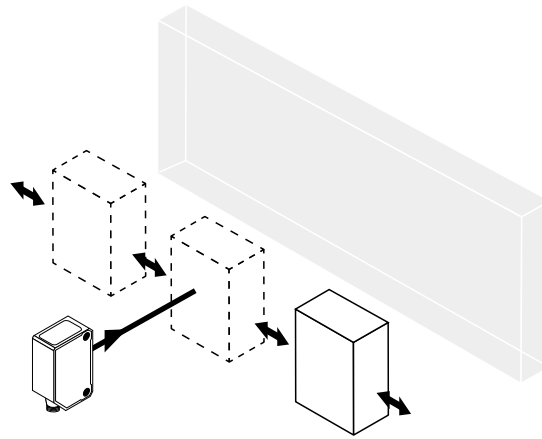


Image 25: G

46 Diagnostica delle anomalie

La tabella I mostra quali provvedimenti si devono adottare quando il sensore non funziona più.

47 Tabulatore diagnostica delle anomalie

Indicatore LED / figura di errore / LED indicator/fault pattern	Causa / Cause	Provvedimento / Measures
Il LED verde non si accende ovvero lampeggia / Green LED does not light up or flickers	Il sensore è ancora pronto per il funzionamento, ma le condizioni di esercizio non sono ottimali (fattore di riserva di funzionamento tra 0,9 e 1,1) / <i>Sensor is still ready for operation, but the operating conditions are not ideal (operating reserve factor between 0.9 and 1.1)</i>	Controllare le condizioni di esercizio: Dirigere il raggio di luce (il punto luminoso) completamente sull'oggetto / Pulizia delle superfici ottiche / Sensibilità (potenziometro) / Controllare la distanza di commutazione e, se necessario, adattarla, vedi grafico E / <i>Check the operating conditions: Fully align the beam of light (light spot) with the object. / Clean the optical surfaces / Readjust the sensitivity (potentiometer) / Check sensing range and adjust if necessary, see Graphic E</i>
Il LED verde non si accende / Green LED does not light up	nessuna tensione o tensione al di sotto del valore soglia / <i>No voltage or voltage below the limit values</i>	Verificare la tensione di alimentazione e/o il collegamento elettrico / <i>Check the power supply, check all electrical connections (cables and plug connections)</i>
Il LED verde non si accende / Green LED does not light up	Interruzioni di tensione / <i>Voltage interruptions</i>	Assicurarsi che ci sia un'alimentazione di tensione stabile / <i>Ensure there is a stable power supply without interruptions</i>
Il LED verde non si accende / Green LED does not light up	Il sensore è guasto / <i>Sensor is faulty</i>	Se l'alimentazione di tensione è regolare, allora chiedere una sostituzione del sensore / <i>If the power supply is OK, replace the sensor</i>

Indicatore LED / figura di errore / LED indicator/fault pattern	Causa / Cause	Provvedimento / Measures
il LED giallo si accende, nessun oggetto nella traiettoria del raggio / <i>Yellow LED lights up, no object in the path of the beam</i>	La distanza tra sensore e sfondo è inferiore alle capacità di funzionamento / <i>/ Distance between the sensor and the background is too short</i>	Diminuire la distanza di commutazione, vedi grafico F / <i>Reduce the sensing range, see Graphic F</i>
Il LED giallo non si accende (vale per dispositivi con aumento della luminosità), ovvero LED giallo si accende (vale per dispositivi con riduzione della luminosità), oggetto nella traiettoria del raggio / <i>Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam</i>	La distanza tra sensore e sfondo è inferiore alle capacità di funzionamento / <i>/ Distance between the sensor and the background is too short</i>	Diminuire la distanza di commutazione, vedi grafico F / <i>Reduce the sensing range, see Graphic F</i>
Il LED giallo non si accende (vale per dispositivi con aumento della luminosità), ovvero LED giallo si accende (vale per dispositivi con riduzione della luminosità), oggetto nella traiettoria del raggio / <i>Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam</i>	La sensibilità ha un'impostazione troppo bassa o la distanza tra sensore e oggetto è troppo grande / <i>Sensitivity is set too low or distance between the sensor and the object is too long</i>	Aumentare la distanza di commutazione, rispettare la distanza tra sensore e sfondo, vedi grafico E / <i>Increase the sensing range, take note of the distance between the sensor and the background, see Graphic E</i>

48 Smontaggio e smaltimento

Lo smaltimento del sensore deve avvenire conformemente alle direttive previste specificatamente dal paese. Per i materiali riciclabili in esso contenuti (in particolare metalli nobili) si auspica un riciclaggio nell'ambito dello smaltimento.

49 Manutenzione

I sensori SICK sono esenti da manutenzione.

A intervalli regolari si consiglia di

- pulire le superfici limite ottiche
- Verificare i collegamenti a vite e gli innesti a spina

Non è consentito effettuare modifiche agli apparecchi.

Contenuti soggetti a modifiche senza preavviso. Le proprietà del prodotto e le schede tecniche indicate non costituiscono una dichiarazione di garanzia.

Sensor fotoeléctrico de reflexión

Instrucciones de uso

52 Instrucciones de seguridad

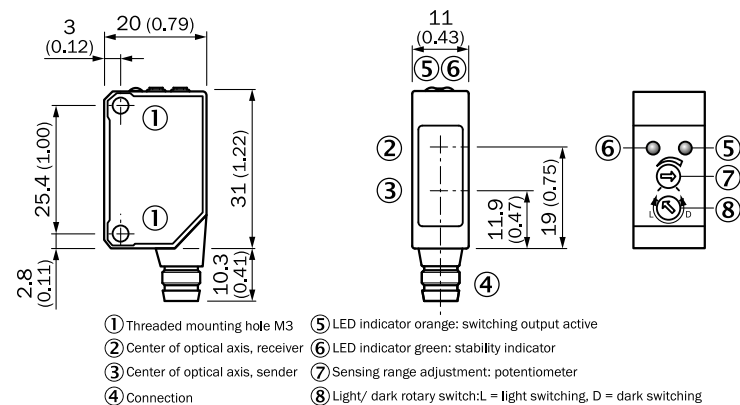
- Lea las instrucciones de uso antes de efectuar la puesta en servicio.
- La conexión, el montaje y el ajuste deben ser efectuados exclusivamente por técnicos especialistas.

- No se trata de un componente de seguridad según la Directiva de máquinas de la UE.
- Proteja el equipo contra la humedad y la suciedad durante la puesta en servicio.
- Las presentes instrucciones de uso contienen información que puede serle necesaria durante todo el ciclo de vida del sensor.

53 Uso conforme a lo previsto

El WT100-2 es un sensor optoelectrónico de reflexión (en lo sucesivo llamado sensor) empleado para la detección óptica y sin contacto de objetos, animales y personas. Cualquier uso diferente al previsto o modificación en el producto invalidará la garantía por parte de SICK AG.

Sensor fotoeléctrico de reflexión con supresión de fondo



54 Puesta en servicio

- 1 Comprobar las condiciones de aplicación: comparar la distancia de conmutación y la distancia respecto al objeto o al fondo, así como la capacidad de remisión del objeto, con el diagrama correspondiente [véase Figura H]. (x = distancia de conmutación, y = zona de transición entre la distancia de conmutación ajustada y la supresión del fondo en % de la distancia de conmutación [remisión del objeto / remisión del fondo]). Remisión: 6 % = negro, 18 % = gris, 90 % = blanco (referido al blanco estándar según DIN 5033).

La distancia mínima (= y) para suprimir el fondo puede calcularse a partir del diagrama [véase fig. H] del modo siguiente:

Ejemplo: x = 50 mm, y = 30 % => 30 % de 50 mm = 15 mm. Es decir, el fondo se suprimirá a partir de una distancia de > 65 mm del sensor.

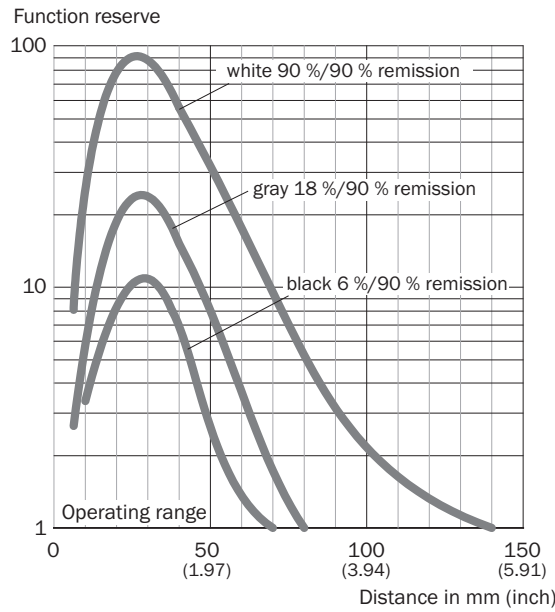


Image 26: H

- 2 Montar el sensor en una escuadra de fijación adecuada (véase el programa de accesorios SICK).

Respetar el par de apriete máximo admisible del sensor de < 0.5 Nm.

Respetar la orientación preferente del objeto con respecto al sensor. [véase fig. A].

- 3 Los sensores deben conectarse sin tensión ($V_S = 0\text{ V}$). Debe tenerse en cuenta la información de las figuras [B] en función de cada tipo de conexión:

- Conexión de enchufes: asignación de pines
- Cable: color del hilo

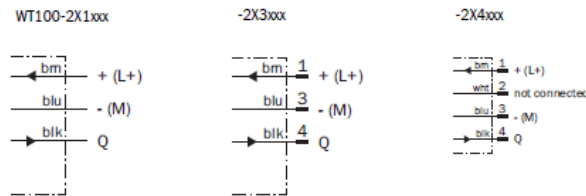


Image 27: B

No conectar o aplicar la fuente de alimentación ($V_S > 0\text{ V}$) hasta que no se hayan realizado todas las conexiones eléctricas. En el sensor se ilumina el LED indicador verde.

Explicaciones relativas al esquema de conexión (figura B)

Salida conmutada Q (según figura B):

WT100-2P (PNP: carga -> M)

WT100-2N (NPN: carga -> L+)

L = conmutación en claro

D = conmutación en oscuro

- 4 Oriente el sensor hacia el objeto. Seleccione una posición que permita que el haz de luz roja del transmisor incida en el centro del objeto. Hay que procurar que la apertura óptica (pantalla frontal) del sensor esté completamente libre [véase figura E]. Recomendamos realizar los ajustes con un objeto de remisión baja.

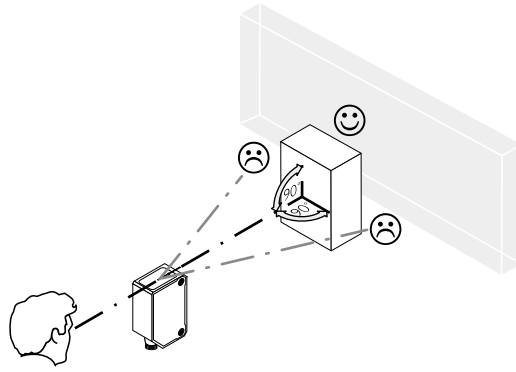
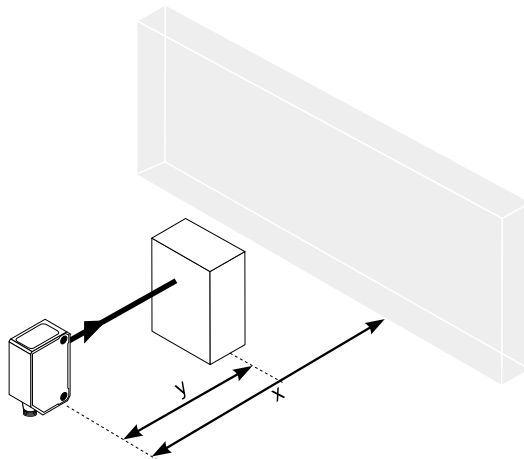


Image 28: E

5



Sensor con potenciómetro:

Con el potenciómetro (tipo: 270°) se ajusta la distancia de conmutación. Giro hacia la derecha: aumenta la distancia de conmutación; giro hacia la izquierda: se reduce la distancia de conmutación. Recomendamos poner la distancia de conmutación en el objeto, p. ej., véase figura F. Una vez ajustada la distancia de conmutación, retirar el objeto de la trayectoria del haz, el fondo se suprime y la salida conmutada cambia (véase Figura C).

El sensor está ajustado y listo para su uso. Para verificar el funcionamiento, véanse las figuras C y G. Si la salida conmutada no se comporta según la figura C, comprobar las condiciones de aplicación. Véase la sección "Diagnóstico de fallos".

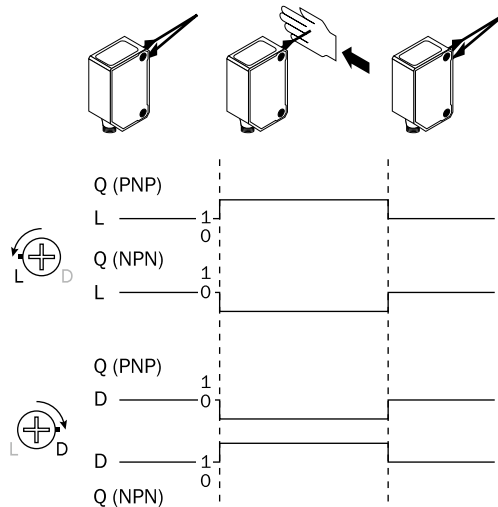


Image 29: C

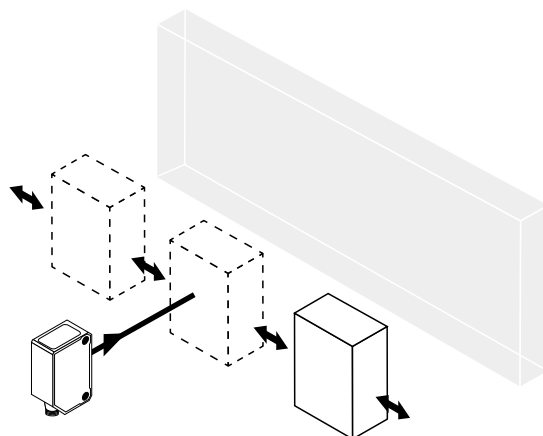


Image 30: G

56 Diagnóstico de fallos

La tabla I muestra las medidas que hay que tomar cuando ya no está indicado el funcionamiento del sensor.

57 Tabla_Diagnóstico de fallos

LED indicador / imagen de error / <i>LED indicator/fault pattern</i>	Causa / <i>Cause</i>	Acción / <i>Measures</i>
El LED verde no se ilumina o parpadea / <i>Green LED does not light up or flickers</i>	El sensor aún está operativo, pero las condiciones de servicio no son óptimas (factor de reserva de funcionamiento entre 0,9 y 1,1) / <i>Sensor is still ready for operation, but the operating conditions are not ideal (operating reserve factor between 0.9 and 1.1)</i>	Comprobar las condiciones de servicio: Alinear el haz de luz (punto de luz) completamente con el objeto / Limpieza de las superficies ópticas / Reajustar la sensibilidad (potenciómetro) / Comprobar la distancia de conmutación y, si es necesario, adaptarla, véase figura E / <i>Check the operating conditions: Fully align the beam of light (light spot) with the object. / Clean the optical surfaces / Readjust the sensitivity (potentiometer) / Check sensing range and adjust if necessary, see Graphic E</i>
El LED verde no se ilumina / <i>Green LED does not light up</i>	Sin tensión o tensión por debajo de los valores límite / <i>No voltage or voltage below the limit values</i>	Comprobar la fuente de alimentación, comprobar toda la conexión eléctrica (cables y conectores) / <i>Check the power supply, check all electrical connections (cables and plug connections)</i>
El LED verde no se ilumina / <i>Green LED does not light up</i>	Interrupciones de tensión / <i>Voltage interruptions</i>	Asegurar una fuente de alimentación estable sin interrupciones de tensión / <i>Ensure there is a stable power supply without interruptions</i>
El LED verde no se ilumina / <i>Green LED does not light up</i>	El sensor está defectuoso / <i>Sensor is faulty</i>	Si la fuente de alimentación no tiene problemas, cambiar el sensor / <i>If the power supply is OK, replace the sensor</i>

LED indicador / imagen de error / <i>LED indicator/fault pattern</i>	Causa / <i>Cause</i>	Acción / <i>Measures</i>
El LED amarillo se ilumina, no hay ningún objeto en la trayectoria del haz / <i>Yellow LED lights up, no object in the path of the beam</i>	La distancia entre el sensor y el fondo es insuficiente / <i>/ Distance between the sensor and the background is too short</i>	Reducir la distancia de conmutación, véase Figura F / <i>Reduce the sensing range, see Graphic F</i>
El LED amarillo no se ilumina (aplicable para dispositivos que conmutan en claro) o el LED amarillo se ilumina (aplicable para dispositivos que conmutan en oscuro), el objeto se encuentra en la trayectoria del haz / <i>Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam</i>	La distancia entre el sensor y el fondo es insuficiente / <i>/ Distance between the sensor and the background is too short</i>	Reducir la distancia de conmutación, véase Figura F / <i>Reduce the sensing range, see Graphic F</i>
El LED amarillo no se ilumina (aplicable para dispositivos que conmutan en claro) o el LED amarillo se ilumina (aplicable para dispositivos que conmutan en oscuro), el objeto se encuentra en la trayectoria del haz / <i>Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam</i>	La sensibilidad ajustada es insuficiente o la distancia entre el sensor y el objeto es excesiva / <i>Sensitivity is set too low or distance between the sensor and the object is too long</i>	Aumentar la distancia de conmutación, tener en cuenta la distancia entre el sensor y el fondo, véase figura E / <i>Increase the sensing range, take note of the distance between the sensor and the background, see Graphic E</i>

58 Desmontaje y eliminación

El sensor tiene que eliminarse siguiendo la normativa aplicable específica de cada país. Los materiales valiosos que contenga (especialmente metales nobles) deben ser eliminados considerando la opción del reciclaje.

59 Mantenimiento

Los sensores SICK no precisan mantenimiento.

A intervalos regulares, recomendamos:

- Limpiar las superficies ópticas externas
- Comprobar las uniones roscadas y las conexiones.

No se permite realizar modificaciones en los aparatos.

Sujeto a cambio sin previo aviso. Las propiedades y los datos técnicos del producto no suponen ninguna declaración de garantía.

反射式光电传感器
操作说明

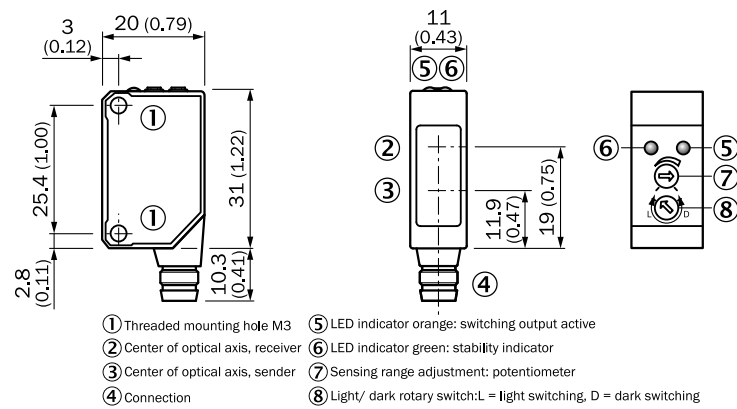
62 安全须知

- 调试前请阅读操作说明。
- 仅允许由专业人员进行接线、安装和设置。
- 本设备非欧盟机械指令中定义的安全部件。
- 调试前防止设备受潮或污染。
- 本操作说明中包含了传感器生命周期中必需的各项信息。

63 拟定用途

WT100-2 是一种漫反射式光电传感器（下文简称为传感器），用于物体、动物和人体的非接触式光学检测。如果滥用本产品或擅自更改产品，则 SICK AG 公司所作之质保承诺均将失效。

带背景抑制功能的反射式光电传感器



64 调试

- 1 检查使用条件：使用随附的图表 [参照 H] 调整开关距离和物体距离，或背景及物体的反射能力（ x = 开关距离， y = 已设置的开关距离和开关距离背景抑制（单位：%）之间的过渡区（物体反射比/背景反射比）。反射比：6% = 黑色，18% = 灰色，90% = 白色（DIN 5033 规定的标准白）。
 根据图表 [参照 H] 按如下方法确定背景遮蔽功能的最小距离 (= y)：
 示例： $x = 50 \text{ mm}$ ， $y = 30\%$ => 50 mm 的 30% = 15 mm 。即，自传感器距离 $> 65 \text{ mm}$ 时，才能抑制背景。

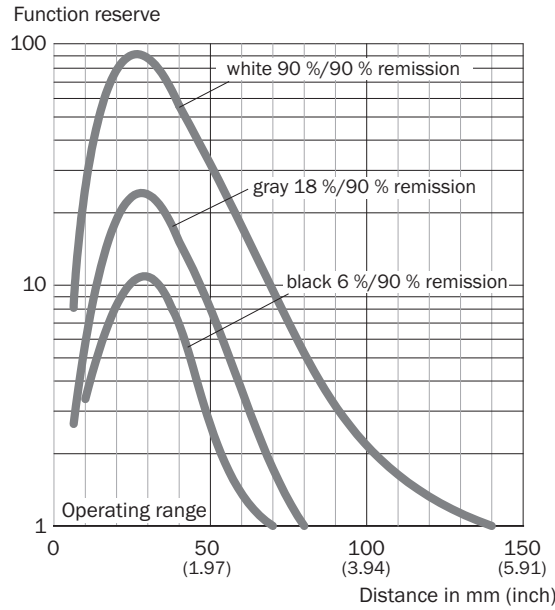


Image 31: H

- 2 将传感器安装在合适的安装托架上（参见 SICK 附件说明书）。
注意传感器的最大允许拧紧扭矩为 < 0.5 Nm。
以传感器为参照物，注意物体的优先方向 [参照 A]。
- 3 必须在无电压状态 ($V_S = 0\text{ V}$) 连接传感器。依据不同连接类型，注意图 [参照 B] 中的信息：

- 插头连接：引线分配

- 导线：芯线颜色

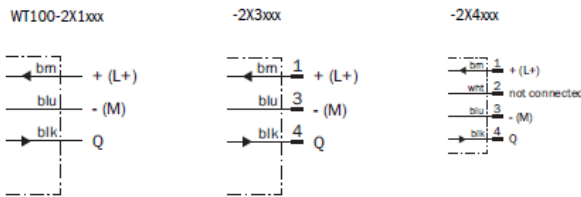


Image 32: B

完成所有电子连接后，才敷设或接通电源 ($V_S > 0\text{ V}$)。传感器上的绿色 LED 指示灯亮起。

接线图（图 B）说明：

开关输出端 Q（根据图 B）：

WT100-2P (PNP：负载 -> M)

WT100-2N (NPN：负载 -> L+)

L = 开灯

D = 关灯

- 4 将传感器对准物体。选择定位，确保红色发射光束射中物体的中间。此时，应注意传感器的光学开口（前部玻璃）处应无任何遮挡 [参照 E]。我们建议使用反射比较低的物体进行设置。

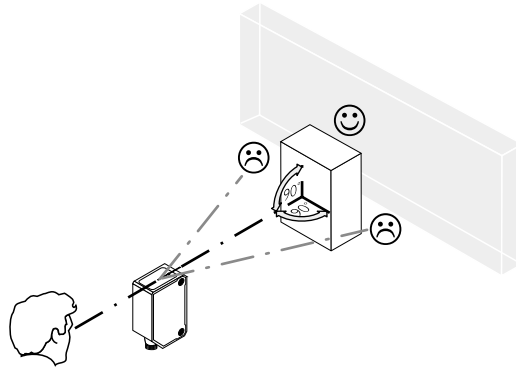
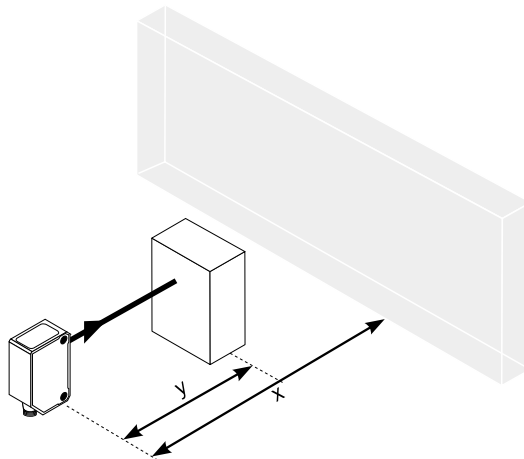


Image 33: E

5



配电位计的传感器：

使用电位计（型号：270°）设置开关距离。向右旋转：提高开关距离，向左旋转：降低开关距离。我们建议开关距离应涵盖物体；例如，参见图 F。开关距离设置完成后，将物体从光路中移除，同时，将抑制背景并改变输出信号开关装置（参见图 C）。

传感器已设置并准备就绪。参照图 C 和 G 检查功能。如果输出信号开关装置的动作不符合图 C，则须检查使用条件。参见故障诊断章节。

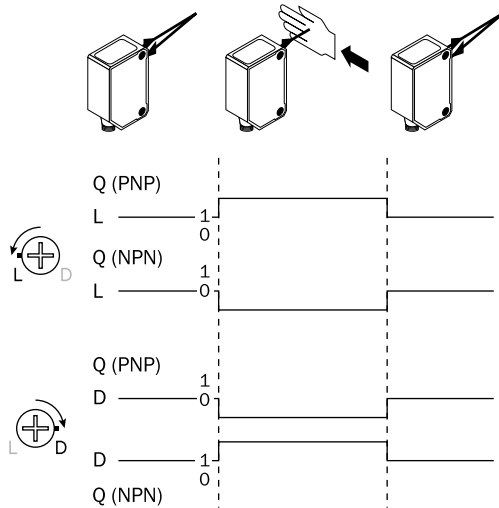


Image 34: C

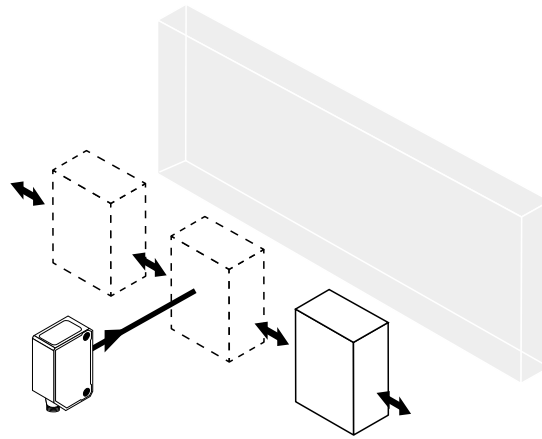


Image 35: G

66 故障诊断

表 I 中罗列了传感器无法执行某项功能时应采取的各项措施。

67 表_故障诊断

LED 指示灯 / 故障界面 / <i>LED indicator/fault pattern</i>	原因 / <i>Cause</i>	措施 / <i>Measures</i>
绿色 LED 未亮起或闪烁 / <i>Green LED does not light up or flickers</i>	尽管传感器准备就绪，但运行条件不佳（信号冗余因数处于 0.9 至 1.1 之间） / <i>Sensor is still ready for operation, but the operating conditions are not ideal (operating reserve factor between 0.9 and 1.1)</i>	检查运行条件：光束（光斑）完全对准物体 / 清洁光学表面 / 重新设置灵敏度（电位计） / 检查开关距离，必要时调整；参见图 E / <i>Check the operating conditions: Fully align the beam of light (light spot) with the object. / Clean the optical surfaces / Readjust the sensitivity (potentiometer) / Check sensing range and adjust if necessary, see Graphic E</i>
绿色 LED 未亮起 / <i>Green LED does not light up</i>	无电压或电压低于极限值 / <i>No voltage or voltage below the limit values</i>	检查电源，检查整体电气连接（导线和插头连接） / <i>Check the power supply, check all electrical connections (cables and plug connections)</i>
绿色 LED 未亮起 / <i>Green LED does not light up</i>	电压中断 / <i>Voltage interruptions</i>	确保电源稳定无中断 / <i>Ensure there is a stable power supply without interruptions</i>
绿色 LED 未亮起 / <i>Green LED does not light up</i>	传感器损坏 / <i>Sensor is faulty</i>	如果电源正常，则更换传感器 / <i>If the power supply is OK, replace the sensor</i>
黄色 LED 亮起，光路中无物体 / <i>Yellow LED lights up, no object in the path of the beam</i>	传感器和背景之间的间距过小 / <i>Distance between the sensor and the background is too short</i>	降低开关距离，参见图 F / <i>Reduce the sensing range, see Graphic F</i>

LED 指示灯 / 故障界面 / LED indicator/fault pattern	原因 / Cause	措施 / Measures
光色 LED 不发亮 (适用于发光仪器), 或黄色 LED 亮起 (适用于关灯仪器), 物体位于光路 / Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam	传感器和背景之间的间距过小 / / Distance between the sensor and the background is too short	降低开关距离, 参见图 F / Reduce the sensing range, see Graphic F
光色 LED 不发亮 (适用于发光仪器), 或黄色 LED 亮起 (适用于关灯仪器), 物体位于光路 / Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam	灵敏度的设置过低或传感器和物体之间的间距过大 / Sensitivity is set too low or distance between the sensor and the object is too long	增大开关距离, 注意传感器和背景之间的间距, 参见图 E / Increase the sensing range, take note of the distance between the sensor and the background, see Graphic E

68 拆卸和废弃处理

必须根据当地特定的法律法规废弃处理传感器。如果其中含有可回收材料 (尤其是贵金属), 则必须在废弃处理时回收利用。

69 保养

SICK 传感器无需保养。

我们建议, 定期:

- 清洁镜头检测面
- 检查螺栓连接和插头连接

不得对设备进行任何改装。

如有更改, 不另行通知。所给出的产品特性和技术参数并非质保声明。

光電近接センサ 取扱説明書

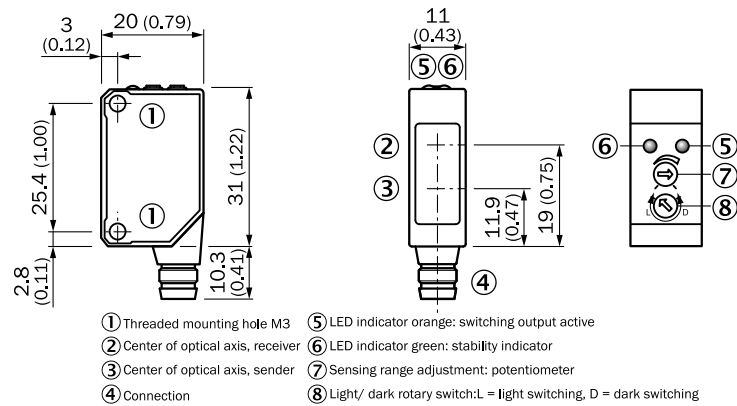
72 安全上の注意事項

- ご使用前に必ず取扱説明書をお読みください。
- 本製品の接続・取り付け・設定は、訓練を受けた技術者が行って下さい。
- 本製品は EU 機械指令の要件を満たす安全コンポーネントではありません。
- 使用開始前に、湿気や汚れから機器を保護して下さい。
- 本取扱説明書には、センサのライフサイクル中に必要となる情報が記載されています。

73 正しいご使用方法

WT100-2 は反射形光電センサ (以下「センサ」) で、物体、動物または人などを光学的技術により非接触で検知するための装置です。本製品が本来の使用用途以外の目的に使用されたり、何らかの方法で改造された場合、SICK AG に対するいかなる保証要求も無効になります。

背景抑制付き光電近接センサ



74 使用開始

- 1 使用条件を確認してください: 検出範囲および対象物または背景への距離、ならびに対象物の反射率を、対応する図 [H を参照] に従って調整します (x = 検出範囲、y = 設定した検出範囲と検出範囲の % としての背景抑制との間の移行距離 (対象物反射率 / 背景反射率))。反射率: 6 % = 黒、18 % = グレー、90 % = 白 (DIN 5033 に準拠した白) 背景抑制のための最低必要距離 (= y) は図 [H を参照] から以下のように算出することができます:
 例: x = 50 mm、y = 30 % => 30 % (50 mm = 15 mm のうち)。つまり背景がセンサからの距離が 65 mm より大きい場合に抑制されます。

Function reserve

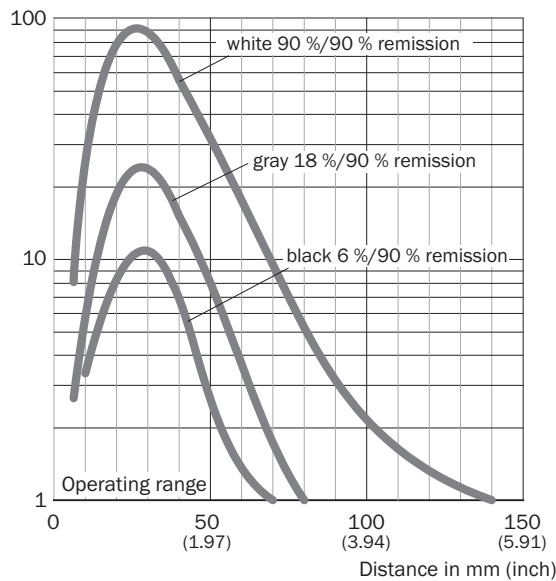


Image 36: H

- 2 適切なブラケットを使用してセンサを取り付けます (SICK 付属品カタログを参照)。センサの締め付けトルクの最大許容値 < 0.5 Nm に注意してください。センサに対して対象物が検出可能な方向にあることを確認してください。
- 3 センサの接続は必ず無電圧状態 ($V_S = 0 V$) で行ってください。接続タイプに応じて、図 [B] の情報に注意する必要があります:
 - オスコネクタ接続: ピン割り当て
 - ケーブル: 芯の色

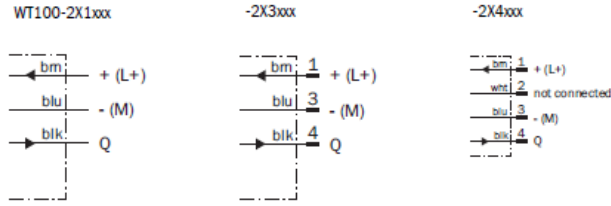


Image 37: B

まずすべての電気接続を確立してから、電源 ($V_S > 0V$) をオンにしてください。緑色の LED 表示灯がセンサ上で点灯します。

接続図の説明 (図 B)。

スイッチング出力 Q (図 B に準拠) :

WT100-2P (PNP : 負荷 -> M)

WT100-2N (NPN : 負荷 -> L+)

L = ライトオン

D = ダークオン

- 4 センサを対象物に合わせます。赤色の投光軸が対象物の中央に照射されるように位置を選択します。センサの光開口 (フロントガラス) が全く遮らぎられないことがないように、注意してください [E を参照]。反射率の低い対象物を使用して調整することをお勧めします。

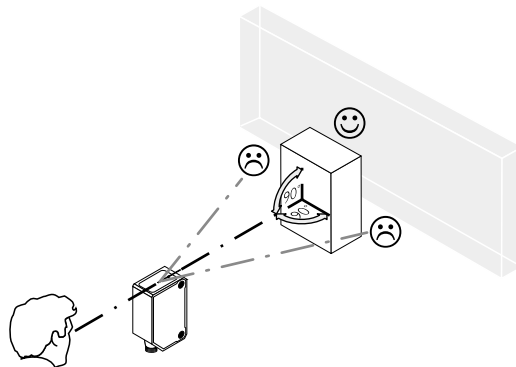
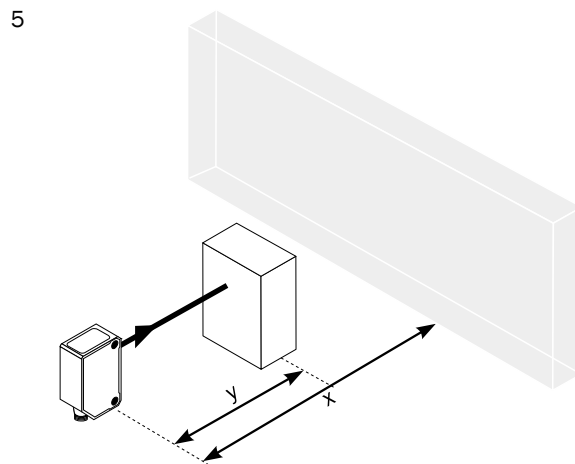


Image 38: E



ポテンシオメータ付きセンサ:

ポテンシオメータ (タイプ: 270°) で検出距離を設定します。右へ回すと検出距離が増大、左へ回すと検出距離が減少します。検出距離を対象物内に入れることをお勧めします。例えばグラフ F を参照してください。感度が設定された後、対象物を光軸から取り除くと背景が抑制され、スイッチング出力が変化します (グラフ C を参照)。

これでセンサは設定され動作準備が整いました。機能を点検するために、グラフ C および G を使用します。スイッチング出力がグラフ C に従った動作を示さない場合は、使用条件を点検してください。故障診断の章を参照。

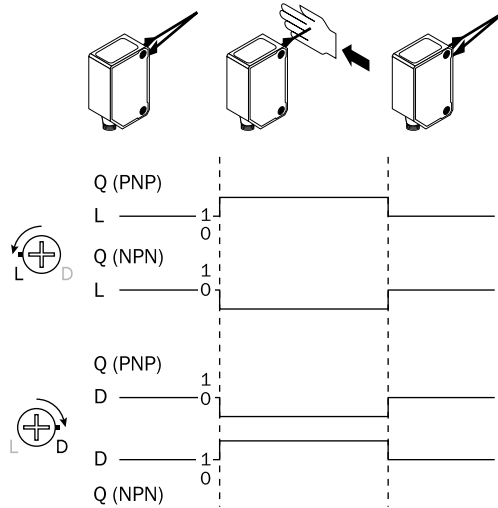


Image 39: C

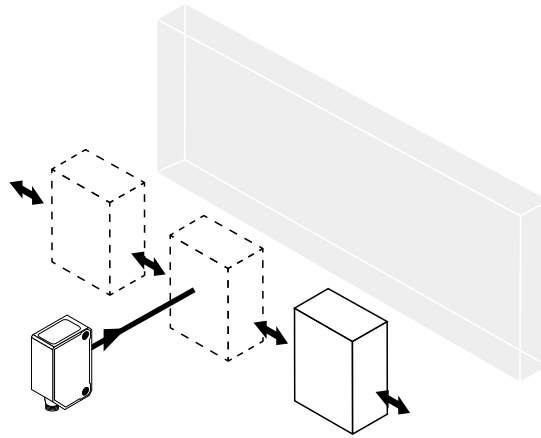


Image 40: G

76 故障診断

表 I は、センサが機能しなくなった場合に、どのような対策を講じるべきかを示しています。

77 Tab_エラー診断

LED 表示灯/故障パターン / LED indicator/fault pattern	原因 / Cause	対策 / Measures
緑色の LED が点灯しない、またはちらつく / Green LED does not light up or flickers	センサは操作可能状態ですが、動作条件に問題があります（動作余裕係数 0.9~1.1）。 / Sensor is still ready for operation, but the operating conditions are not ideal (operating reserve factor between 0.9 and 1.1)	動作条件を確認します： 投光光軸（投光スポット）を対象物に完全に合わせます / 光学面を清掃する / 感度を再調整する（感度調整ボリューム） / 検出範囲を確認し必要に応じて調整します、図 E を参照 / Check the operating conditions: Fully align the beam of light (light spot) with the object. / Clean the optical surfaces / Readjust the sensitivity (potentiometer) / Check sensing range and adjust if necessary, see Graphic E

LED 表示灯/故障パターン / LED indicator/fault pattern	原因 / Cause	対策 / Measures
緑色の LED が点灯しない / Green LED does not light up	無電圧、または電圧が限界値以下 / No voltage or voltage below the limit values	電源を確認し、すべての電気接続（ケーブルおよびプラグ接続）を確認します / Check the power supply, check all electrical connections (cables and plug connections)
緑色の LED が点灯しない / Green LED does not light up	電圧がきていない又は不安定 / Voltage interruptions	安定した電源電圧が供給されていることを確認します / Ensure there is a stable power supply without interruptions
緑色の LED が点灯しない / Green LED does not light up	センサの異常 / Sensor is faulty	電源に問題がなければ、センサを交換します / If the power supply is OK, replace the sensor
黄色い LED が点灯、光軸に対象物がない / Yellow LED lights up, no object in the path of the beam	/ センサと背景の間隔が短すぎる / / Distance between the sensor and the background is too short	検出範囲を縮小します。グラフ F を参照。 / Reduce the sensing range, see Graphic F
黄色い LED が点灯しない（ライトスイッチング機器に適用）、または黄色い LED が点灯（ダークスイッチング機器に適用）、光軸に対象物がある / Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam	/ センサと背景の間隔が短すぎる / / Distance between the sensor and the background is too short	検出範囲を縮小します。グラフ F を参照。 / Reduce the sensing range, see Graphic F
黄色い LED が点灯しない（ライトスイッチング機器に適用）、または黄色い LED が点灯（ダークスイッチング機器に適用）、光軸に対象物がある / Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam	センサの設定感度が低すぎるか、またはセンサと対象物との距離が長すぎる / Sensitivity is set too low or distance between the sensor and the object is too long	検出範囲を拡大し、センサと背景の間隔に注意します、図 E を参照 / Increase the sensing range, take note of the distance between the sensor and the background, see Graphic E

78 解体および廃棄

センサは必ず該当国の規制にしたがって処分してください。廃棄処理の際には、できるだけ構成材料をリサイクルするよう努めてください（特に貴金属類）。

79 メンテナンス

SICK センサはメンテナンスフリーです。

定期的に以下を行うことをお勧めしています：

- レンズ境界面の清掃
- ネジ締結と差込み締結の点検

機器を改造することは禁止されています。

記載内容につきましては予告なしに変更する場合がございますのであらかじめご了承ください。指定された製品特性および技術データは保証書ではありません。

Отражательный световой датчик
Руководство по эксплуатации

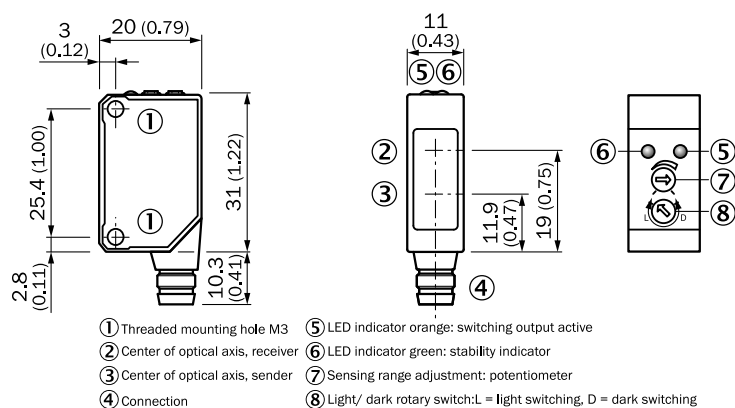
82 Указания по безопасности

- Перед вводом в эксплуатацию изучите руководство по эксплуатации.
- Подключение, монтаж и установку поручать только специалистам.
- Не является оборудованием для обеспечения безопасности в соответствии с Директивой ЕС по работе с машинным оборудованием.
- При вводе в эксплуатацию защищать устройство от попадания грязи и влаги.
- Данное руководство по эксплуатации содержит информацию, которая необходима во время всего жизненного цикла сенсора.

83 Использование по назначению

WT100-2 является оптоэлектронным отражательным световым датчиком (в дальнейшем называемым "сенсор") и используется для оптической бесконтактной регистрации вещей, животных и людей. При ином использовании и при внесении изменений в изделие подача любых гарантийных претензий к SICK AG исключена.

Отражательный световой датчик с подавлением заднего фона



84 Ввод в эксплуатацию

- 1 Проверить условия применения: скорректировать расстояние срабатывания и дистанцию до объекта / фона, а также яркость объекта с помощью соответствующей диаграммы [см. Н] (x = расстояние срабатывания, y = переходная зона между установленным расстоянием срабатывания и подавлением заднего фона в % расстояния срабатывания (яркость объекта / яркость фона)). Яркость: 6 % = черный, 18 % = серый, 90 % = белый (относительно стандартного белого по DIN 5033).
Минимальную дистанцию (= y) для подавления заднего фона можно определить по диаграмме [см. Н] следующим образом:
Пример: x = 50 мм, y = 30 % => 30 % от 50 мм = 15 мм. То есть, фон затемняется при расстоянии > 65 мм от сенсора.

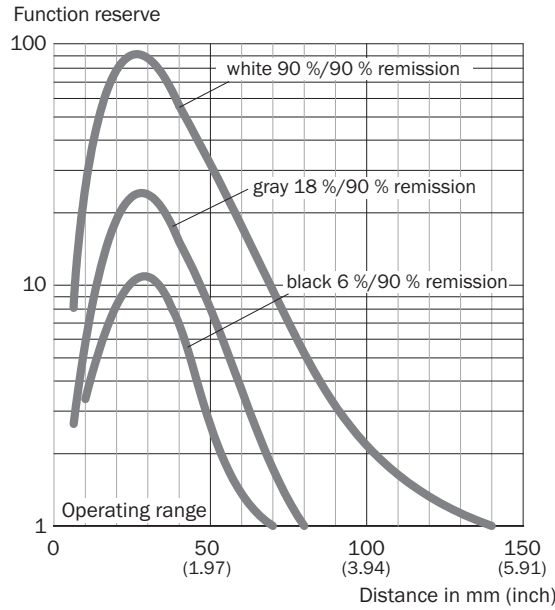


Image 41: H

- Установите сенсор на подходящем крепежном уголке (см. программу принадлежности от SICK).

Выдерживайте максимально допустимый момент затяжки сенсора в < 0.5 Нм.

Учитывайте предпочтительное направление объекта относительно сенсора [см. A].

- Подключайте сенсоры при отключенном напряжении питания ($V_S = 0$ В). В зависимости от типа подключения следует принять во внимание информацию с графиков [см. B]:

- Штекерный разъем: назначение контактов
- Проводник: цвет жилы

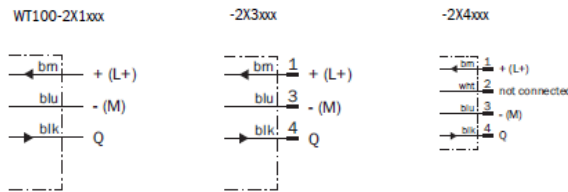


Image 42: B

Подавайте и включайте напряжение питания только после завершения подключения всех электрических соединений ($V_S > 0$ В). На сенсоре включается зеленый светодиодный индикатор.

Пояснения к схеме электрических соединений (график B):

Коммутирующий выход Q (согласно графику B):

WT100-2P (PNP: нагрузка -> M)

WT100-2N (NPN: нагрузка -> L+)

L = срабатывание при наличии света

D = срабатывание при отсутствии света

- Направьте сенсор на объект. Выберите такую позицию, чтобы красный луч передатчика попадал в центр объекта. Оптическое отверстие (фронтальное стекло) на сенсоре должно быть полностью свободным [см. E]. Рекомендуется выполнять настройку с объектом пониженной яркости.

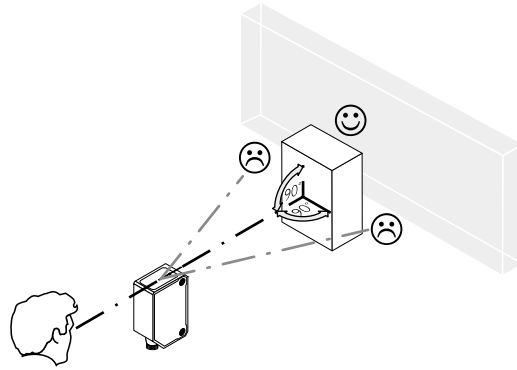
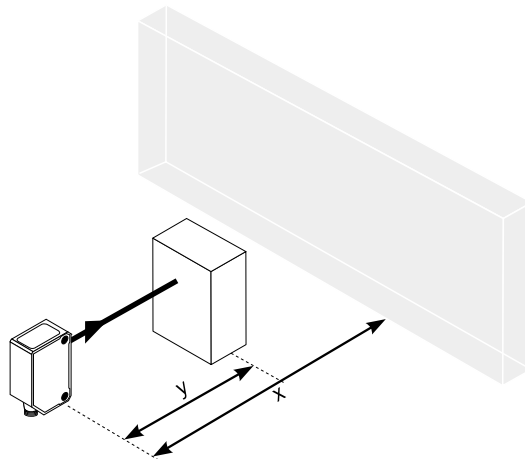


Image 43: E

5



Сенсор с потенциометром:

С помощью потенциометра (тип: 270°) регулируется расстояние срабатывания. Вращение вправо: увеличение дистанции переключения, вращение влево: уменьшение дистанции переключения. Рекомендуется установить дистанцию срабатывания в объекте, например, см. график F. После регулировки дистанции срабатывания удалить объект с пути луча, при этом основание затемняется и состояние коммутирующего выхода изменяется (см. график C).

Сенсор настроен и готов к эксплуатации. Для проверки функционирования воспользуйтесь графиками C и G. Если характер поведения коммутирующего выхода не соответствует графику C, проверить условия применения. См. раздел "Диагностика неисправностей".

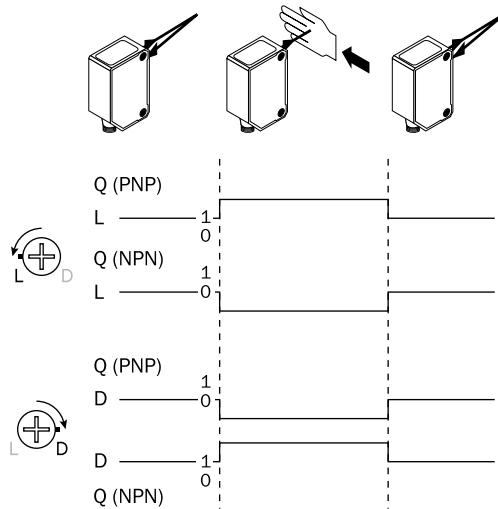


Image 44: C

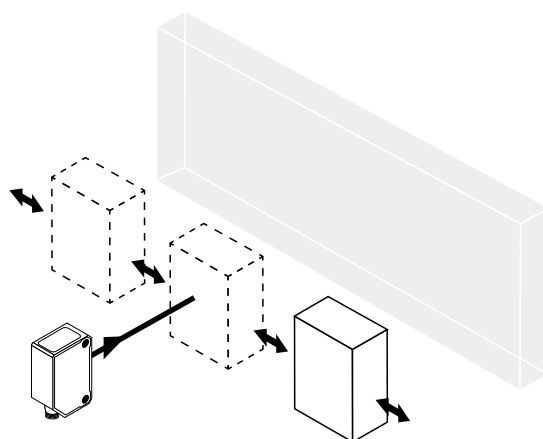


Image 45: G

86 Диагностика неисправностей

В таблице I показано, какие меры нужно предпринять, если сенсоры не работают.

87 Таб_диагностики неисправностей

Светодиодный индикатор / картина неисправности / <i>LED indicator/fault pattern</i>	Причина / <i>Cause</i>	Меры по устранению / <i>Measures</i>
зеленый светодиод не горит или мигает / <i>Green LED does not light up or flickers</i>	Сенсор пока еще готов к работе, но эксплуатационные условия неоптимальны (коэффициент функционального резерва между 0,9 и 1,1) / <i>Sensor is still ready for operation, but the operating conditions are not ideal (operating reserve factor between 0.9 and 1.1)</i>	Проверка эксплуатационных условий: Полностью сориентировать световой луч (световое пятно) на объект / чистка оптических поверхностей / заново настроить чувствительность (потенциометром) / проверить и, при необходимости, скорректировать дистанцию срабатывания, см. график E / <i>Check the operating conditions: Fully align the beam of light (light spot) with the object. / Clean the optical surfaces / Readjust the sensitivity (potentiometer) / Check sensing range and adjust if necessary, see Graphic E</i>
зеленый светодиод не горит / <i>Green LED does not light up</i>	нет напряжения питания или оно ниже нижнего предельного значения / <i>No voltage or voltage below the limit values</i>	Проверить напряжения питания, всю схему электроподключения (проводку и разъемные соединения) / <i>Check the power supply, check all electrical connections (cables and plug connections)</i>
зеленый светодиод не горит / <i>Green LED does not light up</i>	Пропадание напряжения питания / <i>Voltage interruptions</i>	Обеспечить надежную подачу напряжения питания без его пропадания / <i>Ensure there is a stable power supply without interruptions</i>

Светодиодный индикатор / картина неисправности / <i>LED indicator/fault pattern</i>	Причина / <i>Cause</i>	Меры по устранению / <i>Measures</i>
зеленый светодиод не горит / <i>Green LED does not light up</i>	Сенсор неисправен / <i>Sensor is faulty</i>	Если напряжение питания в порядке, то заменить сенсор / <i>If the power supply is OK, replace the sensor</i>
желтый светодиод горит, объект на пути луча отсутствует / <i>Yellow LED lights up, no object in the path of the beam</i>	Расстояние между сенсором и фоном слишком мало / <i>Distance between the sensor and the background is too short</i>	Уменьшить расстояние срабатывания, см. график F / <i>Reduce the sensing range, see Graphic F</i>
желтый светодиод не горит (действительно для устройств с активацией при наличии отраженного света) или желтый светодиод горит (действительно для устройств с активацией при отсутствии отраженного света), объект находится на пути луча / <i>Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam</i>	Расстояние между сенсором и фоном слишком мало / <i>Distance between the sensor and the background is too short</i>	Уменьшить расстояние срабатывания, см. график F / <i>Reduce the sensing range, see Graphic F</i>
желтый светодиод не горит (действительно для устройств с активацией при наличии отраженного света) или желтый светодиод горит (действительно для устройств с активацией при отсутствии отраженного света), объект находится на пути луча / <i>Yellow LED does not light up (applies to light switching devices) or yellow LED lights up (applies to dark switching devices), object is in the path of the beam</i>	Установлена слишком малая чувствительность или расстояние между сенсором и объектом слишком велико / <i>Sensitivity is set too low or distance between the sensor and the object is too long</i>	Увеличить дистанцию переключения, соблюдать расстояние между сенсором и фоном, см. график E / <i>Increase the sensing range, take note of the distance between the sensor and the background, see Graphic E</i>

88 Демонтаж и утилизация

Утилизацию сенсоров следует проводить согласно национальным предписаниям по утилизации. Следует стремиться к повторному использованию содержащихся в них материалов (прежде всего, драгоценных металлов).

89 Техобслуживание

Датчики SICK не нуждаются в техобслуживании.

Рекомендуется регулярно

- очищать оптические ограничивающие поверхности
- проверять прочность резьбовых и штекерных соединений

Запрещается вносить изменения в устройства.

Право на ошибки и внесение изменений сохранено. Указанные свойства изделия и технические характеристики не являются гарантией.

								WT100-2Xxx 1x
Sensing range	Schaltabstand	Distance de commutation	Distância de comutação	Distanza di commutazione	Distancia de conmutación	开关距离	検出範囲	10 ... 100 mm
Sensing range max.	Schaltabstand max.	Portée max.	Distância de comutação máx.	Distanza max. di commutazione	Distancia de conmutación máx.	最大开关距离	最大検出範囲	4 ... 140 mm ¹⁾
Light spot diameter/ distance	Lichtfleckdurchmesser/Entfernung	Diamètre spot / distance	Diâmetro do ponto de luz/ distância	Diámetro punto luminoso/ distancia	Diámetro del punto luminoso/ distancia	光斑直径/距离	光点のスポット径/距離	8 mm / 90 mm
Supply voltage U _v	Versorgungsspannung U _v	Tension d'alimentation U _v	Tensão de alimentação U _v	Tensione di alimentazione U _v	Tensión de alimentación U _v	供电电压 U _v	供給電圧 U _v	DC 10 ... 30 V ²⁾
Output current I _{max.}	Ausgangsstrom I _{max.}	Courant de sortie I _{max.}	Corrente de saída I _{max.}	Corrente di uscita I _{max.}	Intensidad de salida I _{max.}	输出电流 I _{max.}	出力電流 I _{max.}	100 mA
Max. switching frequency	Schaltfolge max.	Commutation max.	Sequência máx. de comutação	Sequenza di commutazione max.	Secuencia de conmutación máx.	最大开关操作顺序	最大スイッチング周波数	1,000 Hz ³⁾
Max. response time	Ansprechzeit max.	Temps de réponse	Tempo de resposta	Tempo di reazione	Tiempo de respuesta	响应时间	応答時間	≤ 0.5 ms ⁴⁾
Enclosure rating	Schutzart	Indice de protection	Tipo de proteção	Tipo di protezione	Tipo de protección	防护类型	保護等級	IP 67
Protection class	Schutzklasse	Classe de protection	Classe de proteção	Classe di protezione	Clase de protección	防护等级	保護クラス	III
Circuit protection	Schutzschaltungen	Protections électriques	Circuitos de proteção	Commutazioni di protezione	Circuitos de protección	保护电路	回路保護	A,B,D ⁵⁾
Ambient operating temperature	Betriebsumgebungstemperatur	Température de service	Temperatura ambiente de funcionamento	Temperatura ambientale di funzionamento	Temperatura ambiente de servicio	工作环境温度	周辺温度 (作動中)	-25 ... +55 °C
<p>1) Object with 90 % remission (based on standard white DIN 5033)</p> <p>2) Limit value: operation in short-circuit protection mains max. 8 A; residual ripple max. 5 Vss</p> <p>3) With light / dark ratio 1:1</p> <p>4) Signal transit time with resistive load</p> <p>5) A = UV-connections reverse polarity protected</p>	<p>1) Tastgut mit 90 % Remission (bezogen auf Standard-Weiß DIN 5033)</p> <p>2) Grenzwerte: Betrieb im kurzschlussgeschützten Netz max. 8 A; Restwelligkeit max. 5 Vss</p> <p>3) Mit Hell- / Dunkelverhältnis 1:1</p> <p>4) Signallaufzeit bei ohmscher Last</p> <p>5) A = UV-Anschlüsse verpolsicher</p>	<p>1) Objet avec 90 % de réémission (par rapport au blanc standard selon DIN 5033)</p> <p>2) Valeurs limites : fonctionnement sur réseau protégé contre les courts-circuits max. 8 A ; ondulation résiduelle max. 5 Vcc</p> <p>3) Pour un rapport clair/sombre de 1:1</p>	<p>1) Objeto a ser detectado com 90% de luminância (com base no padrão branco DIN 5033)</p> <p>2) Valores limite: funcionamento com rede à prova de curto-circuito máx. 8 A; ondulação residual máx. 5 Vss</p> <p>3) Com proporção sombra/luz 1:1</p>	<p>1) Oggetto con il 90% di remissione (riferito al bianco standard DIN 5033)</p> <p>2) Valori limite: funzionamento in rete protetta da cortocircuito max. 8 A; ondula-zione residua max. 5 Vss</p> <p>3) Con rapporto chiaro / scuro 1:1</p> <p>4) Durata seg-nale con carico ohmico</p>	<p>1) Material con un 90% de reflexión (sobre el blanco estándar según DIN 5033)</p> <p>2) Valores límite: funcionamiento en red protegida contra cortocircuitos máx. 8 A; ondula-ción residual máx. 5 Vss</p> <p>3) Con una relación claro/oscu-ro de 1:1</p> <p>4) Duración de la señal con carga óhmica</p>	<p>1) 具有 90 % 反射比的扫描对象 (指 DIN 5033 规定的标准白)</p> <p>2) 极限值: 在防短路电网中运行, 最大 8 A; 最大余波 5 Vss</p> <p>3) 明暗比为 1:1</p> <p>4) 信号传输时间 (电阻负载时)</p> <p>5) A = UV 接口 (已采取反极性保护措施)</p> <p>B = 具有反极性保护的输入端和输出端</p>	<p>1) 反射率 90 % の対象物 (DIN 5033 に準拠した白色)</p> <p>2) 限界値: 短絡保護の操作は最大 8 A; 残留リップルは最大 5 Vss</p> <p>3) ライト/ダークの比率 1:1</p> <p>4) A = UV 接続は逆接保護</p> <p>B = 入力および出力は逆接保護</p> <p>D = 出力過電流および短絡保護</p>	

								WT100-2Xxx 1x
<p>B = inputs and output reverse-polarity protected</p> <p>D = outputs overcurrent and short-circuit protected</p>	<p>B = Ein- und Ausgänge verpolsichert</p> <p>D = Ausgänge überstrom- und kurzschlussfest</p>	<p>4) Temps de propagation du signal sur charge ohmique</p> <p>5) A = raccords UV protégés contre les inversions de polarité</p> <p>B = entrées et sorties protégées contre les inversions de polarité</p> <p>D = sorties protégées contre les courts-circuits et les surcharges</p>	<p>4) Tempo de funcionamento do sinal com carga ôhmica</p> <p>5) A = conexões protegidas contra inversão de pólos UV</p> <p>B = Entradas e saídas protegidas contra polaridade inversa</p> <p>D = Saídas protegidas contra sobre-corrente e curto-circuito</p>	<p>5) A = UV-Allacciamenti protetti dall'inversione di polarità</p> <p>B = entrate e uscite protette da polarità inversa</p> <p>D = uscite protette da sovracorrente e da cortocircuito.</p>	<p>5) Conexiones</p> <p>A = UV protegidas contra polarización inversa</p> <p>B = Entradas y salidas protegidas contra polarización incorrecta</p> <p>D=Salidas a prueba de sobrecorriente y cortocircuitos.</p>	<p>D = 抗过载电流和抗短路输出端</p>		