DAPPRA AUTOMATION

Technical Datasheet

Industrial Area Sensor & Safety Light Curtain

DPR-0640-NPN-NC

6-beam multiple parallel beam through-beam detection sensor with 40 mm optical axis pitch, 200 mm protection height and NPN NC output. Designed for industrial object detection, machine protection and personnel protection applications.

SIL 2 / IEC 61508 · IP65 · CE / FCC / ROHS · NPN NC

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> This datasheet provides the technical specifications, wiring information, mechanical dimensions and application guidance for the DAPPRA DPR-0640-NPN-NC Industrial Area Sensor and Safety Light Curtain.

1. Product Overview

The **DAPPRA DPR-0640-NPN-NC** is a DPR Series **Industrial Area Sensor and Safety Light Curtain** designed for industrial object detection, machine protection and personnel protection applications.

The sensor uses **Multiple Parallel Beam Through-Beam Detection Technology** with a separate transmitter and receiver. Six optical beams are arranged at a **40 mm optical axis pitch**, creating a **200 mm protection height** and a **286 mm total height**.

In industrial automation, this product category may also be described as an **Area Sensor**, **Light Curtain Sensor** or **Safety Light Curtain**, depending on the application and required safety function.

2. Product Identity

PARAMETER	SPECIFICATION
Brand	DAPPRA
Product Series	DPR Series
Model	DPR-0640-NPN-NC
SKU	SD73
Product Type	Industrial Area Sensor / Safety Light Curtain
Detection Method	Multiple Parallel Beam Through-Beam Detection
Beam Quantity	**6 Optical Beams**
Optical Axis Pitch	**40 mm**
Protection Height	**200 mm**
Total Height	**286 mm**
Housing Cross Section	29 × 30 mm
Output Type	NPN
Signal Logic	NC (Normally Closed)
Protection Rating	IP65
Safety Certification	SIL 2 / IEC 61508
Compliance	CE / FCC / RoHS

3. Technical Specifications

PARAMETER	DPR-0640-NPN-NC
Brand	DAPPRA
Series	DPR Series
Model	DPR-0640-NPN-NC
SKU	SD73
Product Type	Industrial Area Sensor / Safety Light Curtain
Detection Method	Multiple Parallel Beam Through-Beam Detection
Beam Quantity	**6 Optical Beams**
Optical Axis Pitch	**40 mm**
Protection Height	**200 mm**
Total Height	**286 mm**
Housing Size	29 × 30 mm
Output Type	NPN
Signal Logic	NC (Normally Closed)
Supply Voltage	DC24V ±20%
Detection Distance	0.2–3 m
Response Time	<5 ms
Protection Rating	IP65
Ambient Light Resistance	Up to 10000 Lux
Operating Temperature	-10°C to +55°C
Humidity Resistance	Yes
Oil Protection	Yes
Anti-Vibration	Yes
Anti-Interference	Yes
Safety Standard	IEC 61508
Safety Level	SIL 2
Certifications / Compliance	CE / FCC / RoHS

4. 6-Beam Detection Configuration

CONFIGURATION PARAMETER	VALUE
Beam Quantity	**6 Beams**
Optical Axis Pitch	**40 mm**
Protection Height	**200 mm**
Total Height	**286 mm**

The protection height is determined by the beam arrangement: **(6 − 1) × 40 mm = 200 mm**. The **286 mm** dimension represents the complete sensor height.

5. Model Number Explanation

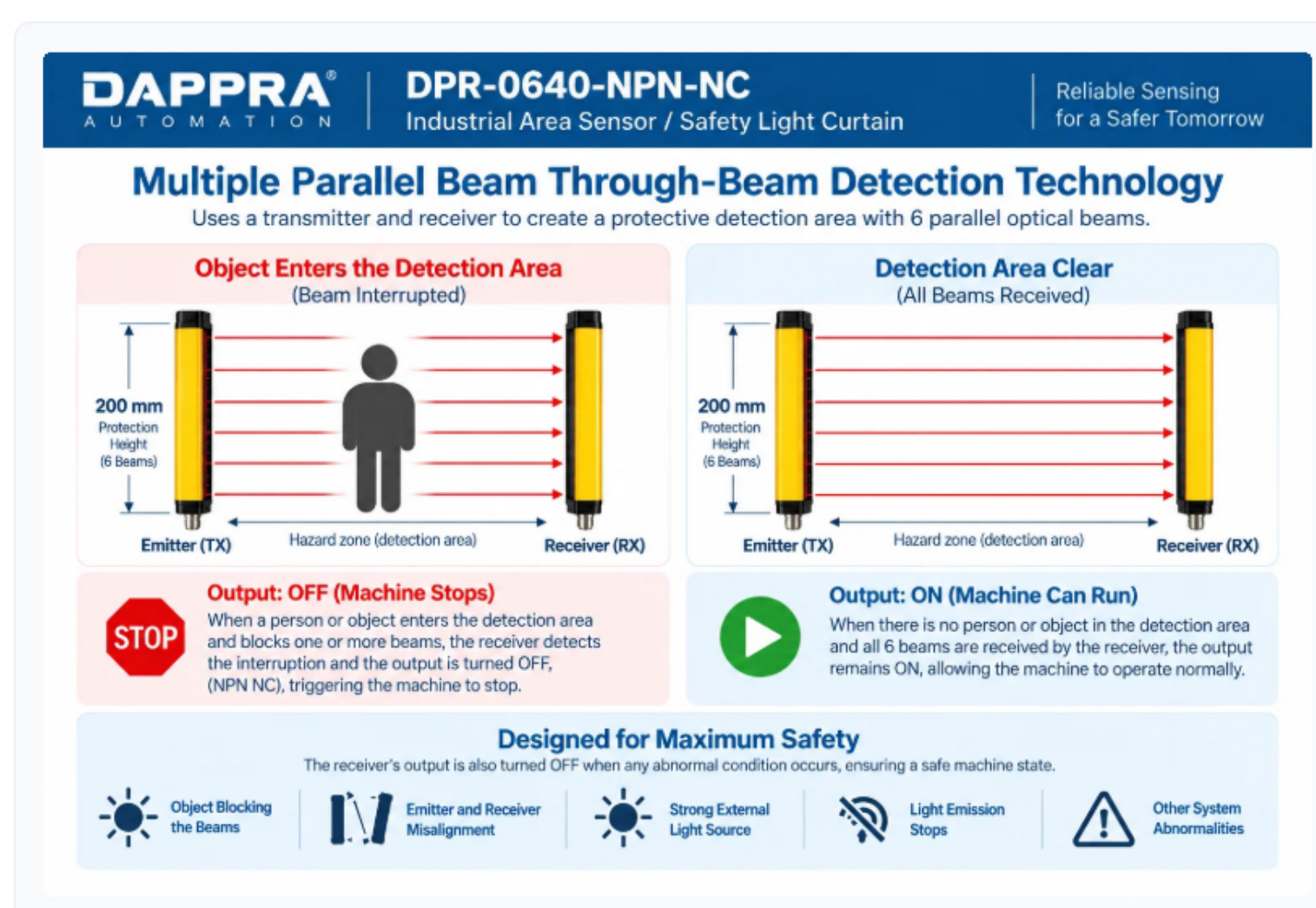
MODEL CODE	MEANING	DESCRIPTION
DPR	Product Series	DAPPRA DPR Industrial Area Sensor Series
06	Beam Quantity	6 optical beams
40	Optical Axis Pitch	40 mm beam spacing
NPN	Output Type	NPN transistor output
NC	Signal Logic	Normally Closed

> **DPR-0640-NPN-NC** → 6 Beams · 40 mm Pitch · NPN · Normally Closed

6. Working Principle

The DPR-0640-NPN-NC uses Multiple Parallel Beam Through-Beam Detection Technology. The transmitter and receiver are installed opposite each other, with 6 optical beams arranged vertically across the sensing field at a 40 mm optical axis pitch.

When an object or person enters the sensing field and interrupts one or more optical beams, the receiver detects the interruption and changes the output according to the configured **NPN NC logic**.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DPR-0640-NPN-NC
Industrial Area Sensor / Safety Light Curtain
Reliable Sensing for a Safer Tomorrow
Multiple Parallel Beam Through-Beam Detection Technology
Object Enters the Detection Area
(Beam Interrupted)
Detection Area Clear
(All Beams Received)
200 mm Protection Height (6 Beams)
Emitter (TX)
Hazard zone (detection area)
Receiver (RX)
STOP
Designed for Maximum Safety
Object Blocking the Beams
Emitter and Receiver Misalignment
Strong External Light Source
Light Emission Stops
Other System Abnormalities

Uses a transmitter and receiver to create a protective detection area with 6 parallel optical beams.

Output: OFF (Machine Stops) When a person or object enters the detection area and blocks one or more beams, the receiver detects the interruption and the output is turned OFF, (NPN NC), triggering the machine to stop.

Output: ON (Machine Can Run) When there is no person or object in the detection area and all 6 beams are received by the receiver, the output remains ON, allowing the machine to operate normally.

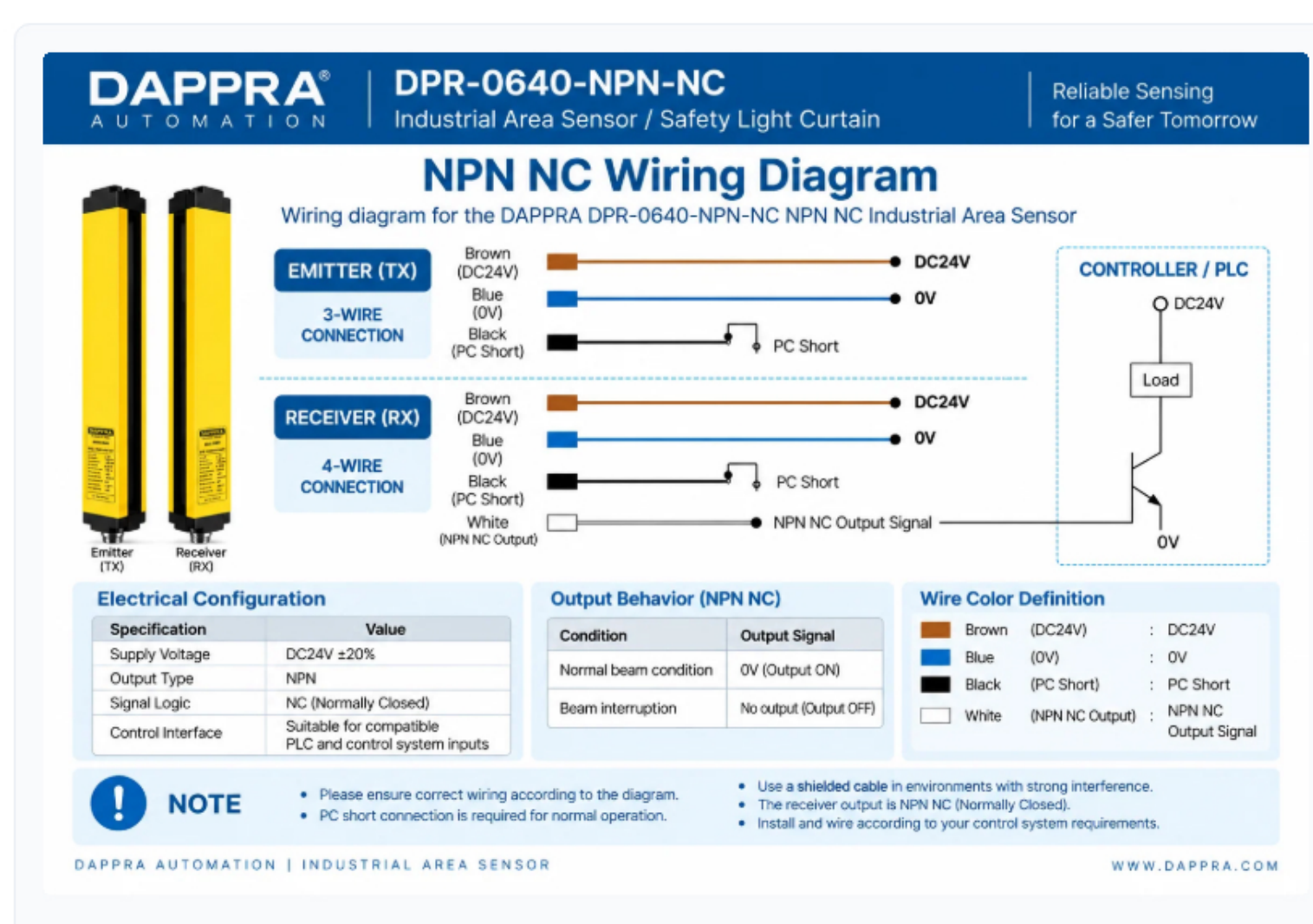
The receiver's output is also turned OFF when any abnormal condition occurs, ensuring a safe machine state.

Figure 6.1 — Working principle of the DPR-0640-NPN-NC Industrial Area Sensor

7. NPN NC Output & Wiring

ELECTRICAL CONFIGURATION	SPECIFICATION
Supply Voltage	DC24V ±20%
Output Type	NPN
Signal Logic	NC (Normally Closed)
Control Interface	Suitable for compatible PLC and control-system inputs

For the specified NC configuration, normal beam transmission produces a 0V output and beam interruption results in no output.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Industrial Area Sensor / Safety Light Curtain
Reliable Sensing for a Safer Tomorrow
NPN NC Wiring Diagram
EMITTER (TX)
3-WIRE CONNECTION
RECEIVER (RX)
4-WIRE CONNECTION
Brown (DC24V)
Blue (0V)
Black (PC Short)
White (NPN NC Output)
DC24V
0V
PC Short
NPN NC Output Signal
CONTROLLER / PLC
DC24V
Load
0V
Emitter (TX)
Receiver (RX)
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Wiring diagram for the DAPPRA DPR-0640-NPN-NC NPN NC Industrial Area Sensor

Electrical Configuration

Specification	Value
Supply Voltage	DC24V ±20%
Output Type	NPN
Signal Logic	NC (Normally Closed)
Control Interface	Suitable for compatible PLC and control system inputs

Output Behavior (NPN NC)

Condition	Output Signal
Normal beam condition	0V (Output ON)
Beam interruption	No output (Output OFF)

Wire Color Definition

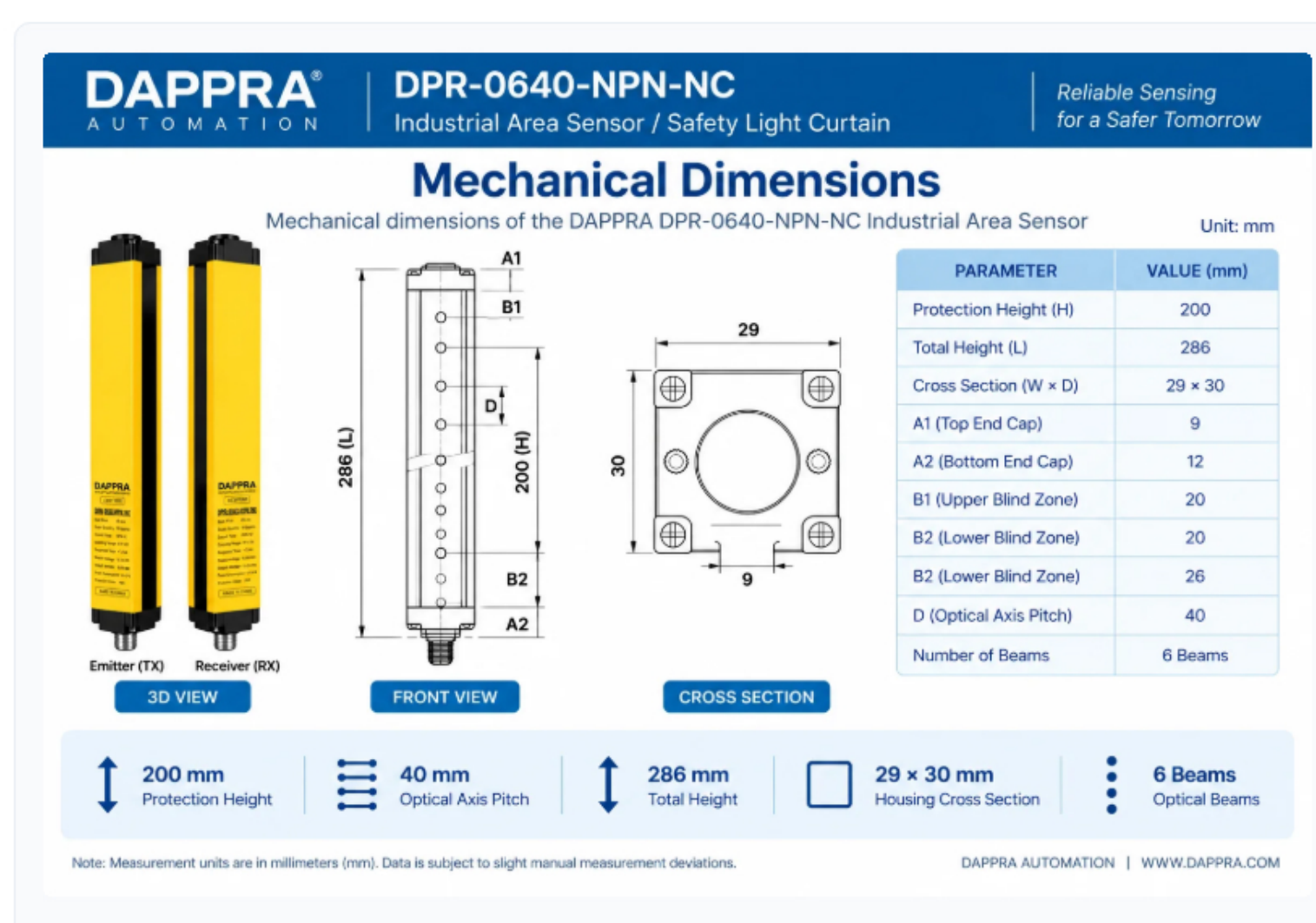
Brown	(DC24V)	:	DC24V
Blue	(0V)	:	0V
Black	(PC Short)	:	PC Short
White	(NPN NC Output)	:	NPN NC Output Signal

NOTE
- Please ensure correct wiring according to the diagram.
- PC short connection is required for normal operation.
- Use a **shielded cable** in environments with strong interference.
- The receiver output is NPN NC (Normally Closed).
- Install and wire according to your control system requirements.

Figure 7.1 — Wiring diagram for the DPR-0640-NPN-NC NPN NC Industrial Area Sensor

8. Mechanical Dimensions

- **200 mm** protection height
- **286 mm** total height
- **29 × 30 mm** housing cross section
- **40 mm** optical axis pitch
- **6** optical beams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Industrial Area Sensor / Safety Light Curtain
Reliable Sensing for a Safer Tomorrow
Mechanical Dimensions
Unit: mm
A1
B1
D
286 (L)
200 (H)
B2
A2
29
30
9
Emitter (TX)
Receiver (RX)
3D VIEW
FRONT VIEW
CROSS SECTION
200 mm Protection Height
40 mm Optical Axis Pitch
286 mm Total Height
29 × 30 mm Housing Cross Section
6 Beams Optical Beams
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Mechanical dimensions of the DAPPRA DPR-0640-NPN-NC Industrial Area Sensor

PARAMETER	VALUE (mm)
Protection Height (H)	200
Total Height (L)	286
Cross Section (W × D)	29 × 30
A1 (Top End Cap)	9
A2 (Bottom End Cap)	12
B1 (Upper Blind Zone)	20
B2 (Lower Blind Zone)	20
B2 (Lower Blind Zone)	26
D (Optical Axis Pitch)	40
Number of Beams	6 Beams

Note: Measurement units are in millimeters (mm). Data is subject to slight manual measurement deviations.

Figure 8.1 — Mechanical dimensions of the DPR-0640-NPN-NC Industrial Area Sensor

9. DPR Series Model Selection

MODEL	BEAMS	PITCH	PROTECTION HEIGHT	TOTAL HEIGHT
DPR-0640-NPN-NC	**6**	**40 mm**	**200 mm**	**286 mm**
DPR-0820-NPN-NC	8	20 mm	140 mm	206 mm
DPR-1220-NPN-NC	12	20 mm	220 mm	286 mm
DPR-1620-NPN-NC	16	20 mm	300 mm	366 mm

10. Industrial Applications

- **Machine area detection**
- **Machine entrance monitoring**
- **Conveyor and material flow monitoring**
- **Production-line sensing**
- **Automated equipment**
- **Packaging machinery**
- **Material handling equipment**
- **Machine protection**
- **Personnel protection around machinery**
- **Safety guarding applications**
- **Industrial automation systems**

11. Industrial Environment Performance

- **IP65 protection** — Dust and water resistance
- **Humidity resistance**
- **Oil protection**
- **Anti-vibration performance**
- **Anti-interference performance**
- **Ambient light resistance up to 10000 Lux**
- **Operating temperature -10°C to +55°C**

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DPR-0640-NPN-NC
Industrial Area Sensor / Safety Light Curtain
Reliable Sensing for a Safer Tomorrow
Industrial Applications
Machine Area Detection
Object Detection
Conveyor Monitoring
Machine Entrance Monitoring
Packaging Machinery
Automated Equipment
Typical Applications
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The DPR-0640-NPN-NC can be used in industrial automation applications requiring multi-beam object detection, machine protection or personnel protection.

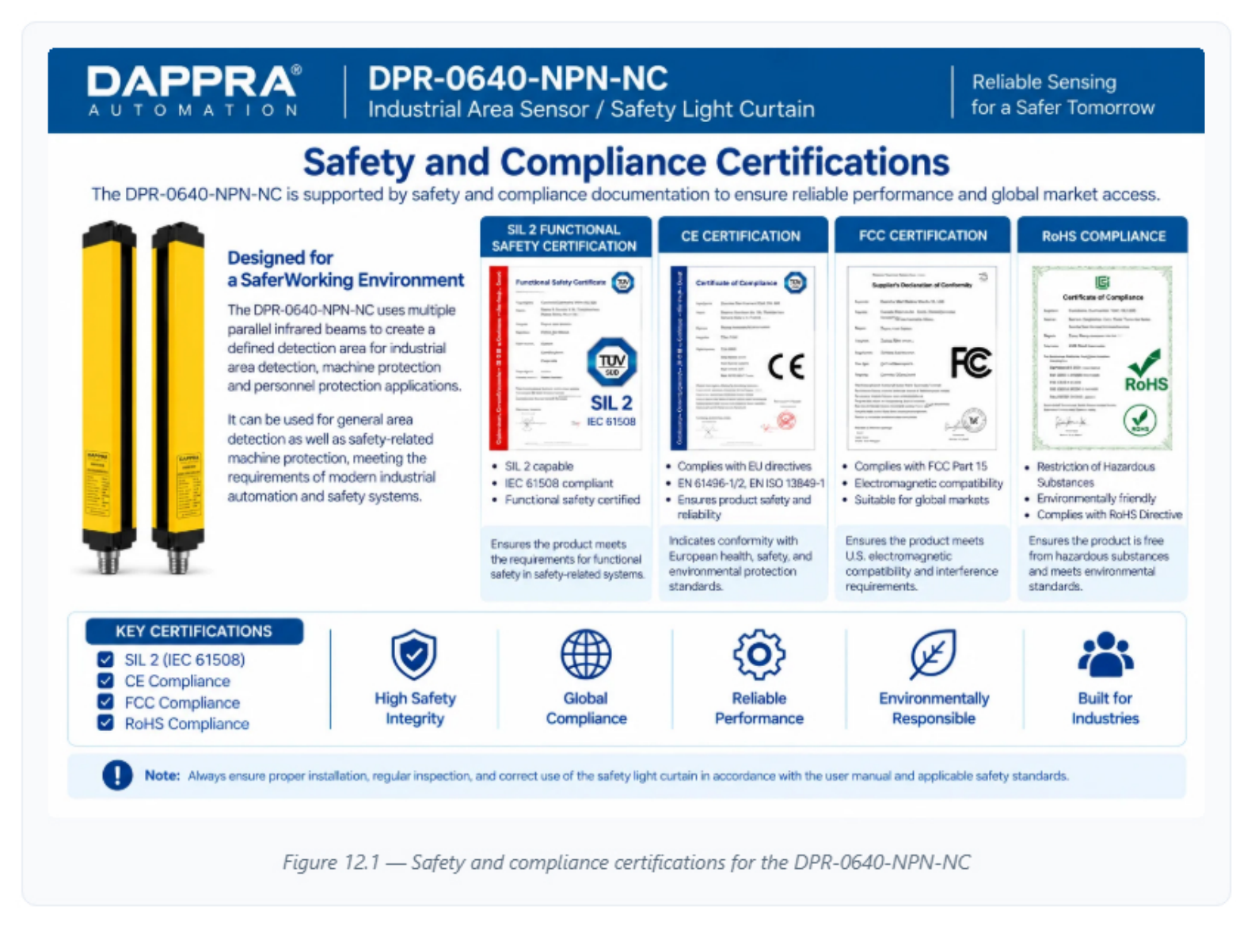
Machine area detection — Multi-beam monitoring across a 200 mm zone
Object detection — Reliable multi-beam object presence sensing
Material detection — Detection of materials in automated equipment
Conveyor monitoring — Material and object detection on conveyor lines
Machine entrance monitoring — Detection at machine access points
Production-line sensing — Multi-beam detection on automated production lines
Automated equipment — Integration into automated machinery
Packaging machinery — Object detection in packaging lines
Material handling equipment — Material detection and control
Industrial automation systems — General automation sensing
Machine protection — Protection of machine operating zones
Personnel protection around machinery — Detection of persons entering protected areas
Safety guarding applications — Support for machine safety guarding

Application suitability depends on the required sensing function, machine risk assessment and applicable safety requirements.

Figure 10.1 — DPR-0640-NPN-NC used for machine detection and protection applications

12. Safety & Certification

- **SIL 2 / IEC 61508** — Functional Safety Certification
- **CE** — Compliance
- **FCC** — Compliance
- **RoHS** — Environmental Compliance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Industrial Area Sensor / Safety Light Curtain
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Safety and Compliance Certifications
SIL 2 FUNCTIONAL SAFETY CERTIFICATION
CE CERTIFICATION
FCC CERTIFICATION
RoHS COMPLIANCE
TÜV
SIL 2
IEC 61508
CE
FC
RoHS
KEY CERTIFICATIONS
High Safety Integrity
Global Compliance
Reliable Performance
Environmentally Responsible
Built for Industries

The DPR-0640-NPN-NC is supported by safety and compliance documentation to ensure reliable performance and global market access.

Designed for a SaferWorking Environment

The DPR-0640-NPN-NC uses multiple parallel infrared beams to create a defined detection area for industrial area detection, machine protection and personnel protection applications.

It can be used for general area detection as well as safety-related machine protection, meeting the requirements of modern industrial automation and safety systems.

SIL 2 Functional Safety Certification:
- SIL 2 capable
- IEC 61508 compliant
- Functional safety certified

Ensures the product meets the requirements for functional safety in safety-related systems.

CE Certification:
- Complies with EU directives
- EN 61496-1/2, EN ISO 13849-1
- Ensures product safety and reliability

Indicates conformity with European health, safety, and environmental protection standards.

FCC Certification:
- Complies with FCC Part 15
- Electromagnetic compatibility
- Suitable for global markets

Ensures the product meets U.S. electromagnetic compatibility and interference requirements.

RoHS Compliance:
- Restriction of Hazardous Substances
- Environmentally friendly
- Complies with RoHS Directive

Ensures the product is free from hazardous substances and meets environmental standards.

KEY CERTIFICATIONS
- ☑ SIL 2 (IEC 61508)
- ☑ CE Compliance
- ☑ FCC Compliance
- ☑ RoHS Compliance

Note: Always ensure proper installation, regular inspection, and correct use of the safety light curtain in accordance with the user manual and applicable safety standards.

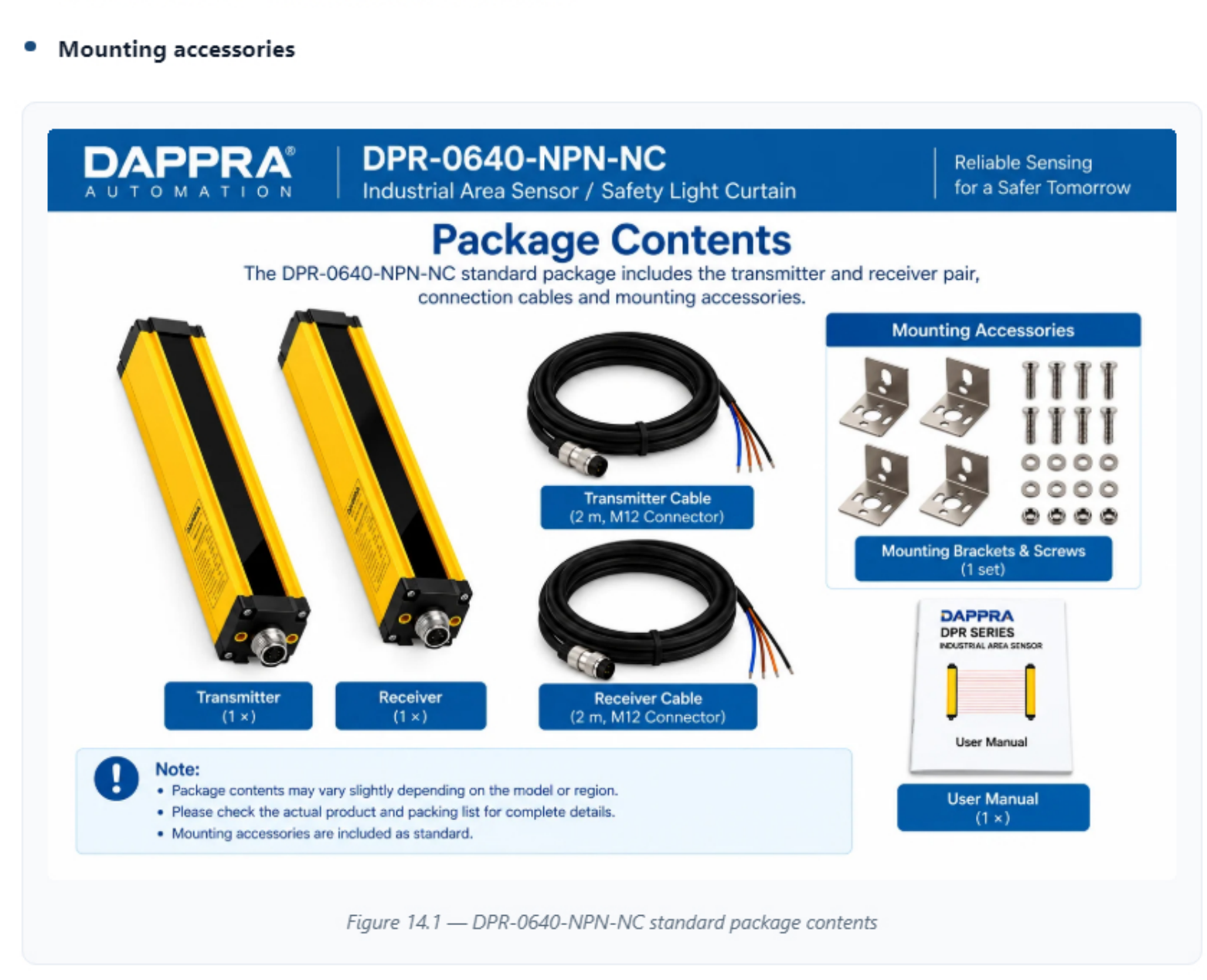
Figure 12.1 — Safety and compliance certifications for the DPR-0640-NPN-NC

13. Technical Resources

DOCUMENT	DESCRIPTION
DPR-0640-NPN-NC Datasheet	Specifications, wiring, dimensions and certifications
DPR-0640-NPN-NC Installation Guide	Mounting methods and alignment reference
DPR-0640-NPN-NC CAD Drawing	Mechanical dimensions and installation layout

14. Package Contents

- **1 × Transmitter** — Infrared beam transmitter
- **1 × Receiver** — Infrared beam receiver
- **2 m connection cables** — Pre-terminated cables
- **M12 connection** — Standard industrial connector
- **Mounting accessories**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Package Contents
Transmitter (1 ×)
Receiver (1 ×)
Transmitter Cable (2 m, M12 Connector)
Receiver Cable (2 m, M12 Connector)
Mounting Accessories
Mounting Brackets & Screws (1 set)
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User Manual
User Manual (1 ×)

The DPR-0640-NPN-NC standard package includes the transmitter and receiver pair, connection cables and mounting accessories.

Note:
- Package contents may vary slightly depending on the model or region.
- Please check the actual product and packing list for complete details.
- Mounting accessories are included as standard.

Figure 14.1 — DPR-0640-NPN-NC standard package contents

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