DAPPRA AUTOMATION

DATASHEET

# DPR-1220-NPN-NC

## Industrial Area Sensor & Safety Light Curtain Â· 12â€‘Beam Â· 20 mm Pitch Â· 220 mm Protection Height

The DAPPRA DPR-1220-NPN-NC is a DPR Series Industrial Area Sensor and Safety Light Curtain designed for object detection, machine protection and personnel protection applications. It uses throughâ€‘beam infrared detection with 12 optical beams at a 20 mm optical axis pitch, creating a 220 mm protection height.

| 12 | 20 mm | 220 mm | 286 mm | NPN NC |
|---|---|---|---|---|
| OPTICAL BEAMS | OPTICAL PITCH | PROTECTION HEIGHT | TOTAL HEIGHT | OUTPUT |

**Document:** DPR-1220-NPN-NC Datasheet
**Revision:** 1.0

**SKU:** SD71
**Manufacturer:** DAPPRA Automation

## Product Overview

The **DAPPRA DPR-1220-NPN-NC** is a DPR Series **Industrial Area Sensor and Safety Light Curtain** for industrial object detection, machine protection and personnel protection applications.

The sensor uses a **Multiple Parallel Beam Through-Beam Detection Method** with a separate transmitter and receiver. Twelve optical beams are arranged at a **20 mm optical axis pitch**, creating a **220 mm protection height**. When an object or person enters the detection area and interrupts one or more beams, the receiver detects the interruption and changes the output according to the configured **NPN NC logic**.

## Product Identity

| PARAMETER | SPECIFICATION |
|---|---|
| **Brand** | DAPPRA |
| **Product Series** | DPR Series |
| **Model** | DPR-1220-NPN-NC |
| **SKU** | SD71 |
| **Product Type** | Industrial Area Sensor / Safety Light Curtain |
| **Detection Method** | Multiple Parallel Beam Through-Beam Detection |
| **Manufacturer** | DAPPRA Automation |
| **Brand** | DAPPRA |

## Key Specifications

| PARAMETER | SPECIFICATION |
|---|---|
| **Beam Quantity** | **12 Optical Beams** |
| **Optical Axis Pitch** | **20 mm** |

| PARAMETER | SPECIFICATION |
| --- | --- |
| **Protection Height** | **220 mm** |
| **Total Height** | **286 mm** |
| **Housing Cross Section** | 29 Ã— 30 mm |
| **Output Type** | NPN |
| **Signal Logic** | NC (Normally Closed) |
| **Power Supply** | DC24V Â±20% |
| **Response Time** | <5 ms |
| **Detection Distance** | 0.2â€“3 m |
| **Protection Rating** | IP65 |
| **Operating Temperature** | -10Â°C to +55Â°C |
| **Safety Certification** | SIL 2 / IEC 61508 |
| **Compliance** | CE / FCC / RoHS |

## Working Principle

The DPR-1220-NPN-NC uses a **Multiple Parallel Beam Through-Beam Detection** method with a separate transmitter and receiver. The transmitter continuously sends multiple infrared beams toward the receiver to create a detection area. When an object or person enters the detection zone and blocks one or more beams, the receiver detects the interruption and changes the output signal according to the configured NPN NC logic.

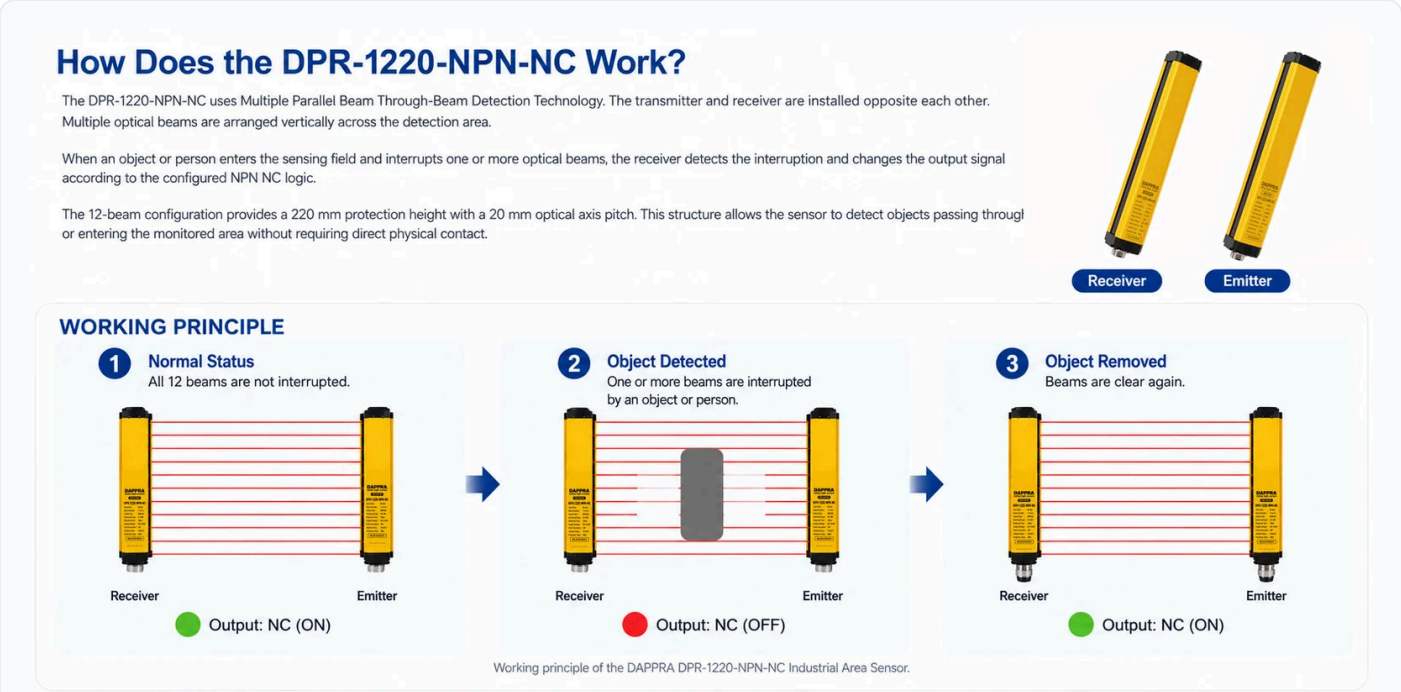



*Figure 1 â€" Working principle of the DPR-1220-NPN-NC Industrial Area Sensor*

### Detection Process

- **Infrared Beam Transmission** â€" The transmitter generates 12 parallel infrared beams and sends them toward the receiver.
- **Detection Area Creation** â€" Twelve optical beams are arranged at a 20 mm optical axis pitch, creating a 220 mm protection height.
- **Object Detection** â€" When an object or person enters the detection area, one or more infrared beams are interrupted.
- **Signal Output** â€" The receiver processes the interruption and changes the output according to the NPN NC configuration.

## Model Number Explanation

The model number of the DAPPRA DPR Series identifies the main technical configuration, including beam quantity, optical axis pitch, output type and signal logic.




*Figure 2 â€" DPR-1220-NPN-NC model number breakdown*

| MODEL CODE | MEANING | DESCRIPTION |
|---|---|---|
| **DPR** | Product Series | DAPPRA DPR Industrial Area Sensor Series |
| **12** | Beam Quantity | 12 optical beams |
| **20** | Optical Axis Pitch | 20 mm beam spacing |
| **NPN** | Output Type | NPN transistor output |
| **NC** | Signal Logic | Normally Closed |

## Technical Specifications

| PARAMETER | SPECIFICATION |
|---|---|
| **Brand** | DAPPRA |
| **Series** | DPR Series |
| **Model** | DPR-1220-NPN-NC |
| **SKU** | SD71 |
| **Product Type** | Industrial Area Sensor / Safety Light Curtain |
| **Beam Quantity** | **12 Optical Beams** |
| **Optical Axis Pitch** | **20 mm** |
| **Protection Height** | **220 mm** |
| **Total Height** | **286 mm** |
| **Housing Size** | 29 Ã— 30 mm |
| **Detection Principle** | Multiple Parallel Beam Through-Beam Detection |
| **Detection Distance** | 0.2â€“3 m |
| **Response Time** | <5 ms |
| **Output Type** | NPN |
| **Signal Logic** | NC (Normally Closed) |
| **Supply Voltage** | DC24V Â±20% |
| **Power Consumption** | <5 W |
| **Output Current** | â‰¤200 mA |
| **Protection Rating** | IP65 |
| **Ambient Light Resistance** | 10000 Lux |
| **Operating Temperature** | -10Â°C to +55Â°C |

| PARAMETER | SPECIFICATION |
| --- | --- |
| **Environmental Features** | Humidity Resistance / Oil Protection / Anti-Vibration / Anti-Interference |
| **Safety Standard** | IEC 61508 |
| **Safety Level** | SIL 2 |
| **Certifications / Compliance** | CE / FCC / RoHS |

## Protection Height Calculation

```
Protection Height = (Beam Quantity âˆ’ 1) Ã— Optical Axis Pitch

(12 âˆ’ 1) Ã× 20 mm = 220 mm
```

## NPN NC Output & Wiring

The DPR-1220-NPN-NC uses an **NPN transistor output** with **Normally Closed (NC)** signal logic. The signal output behavior changes according to the infrared beam detection status.

| CONDITION | SIGNAL OUTPUT |
|---|---|
| Normal beam condition | 0V signal output |
| Beam interruption | No output |

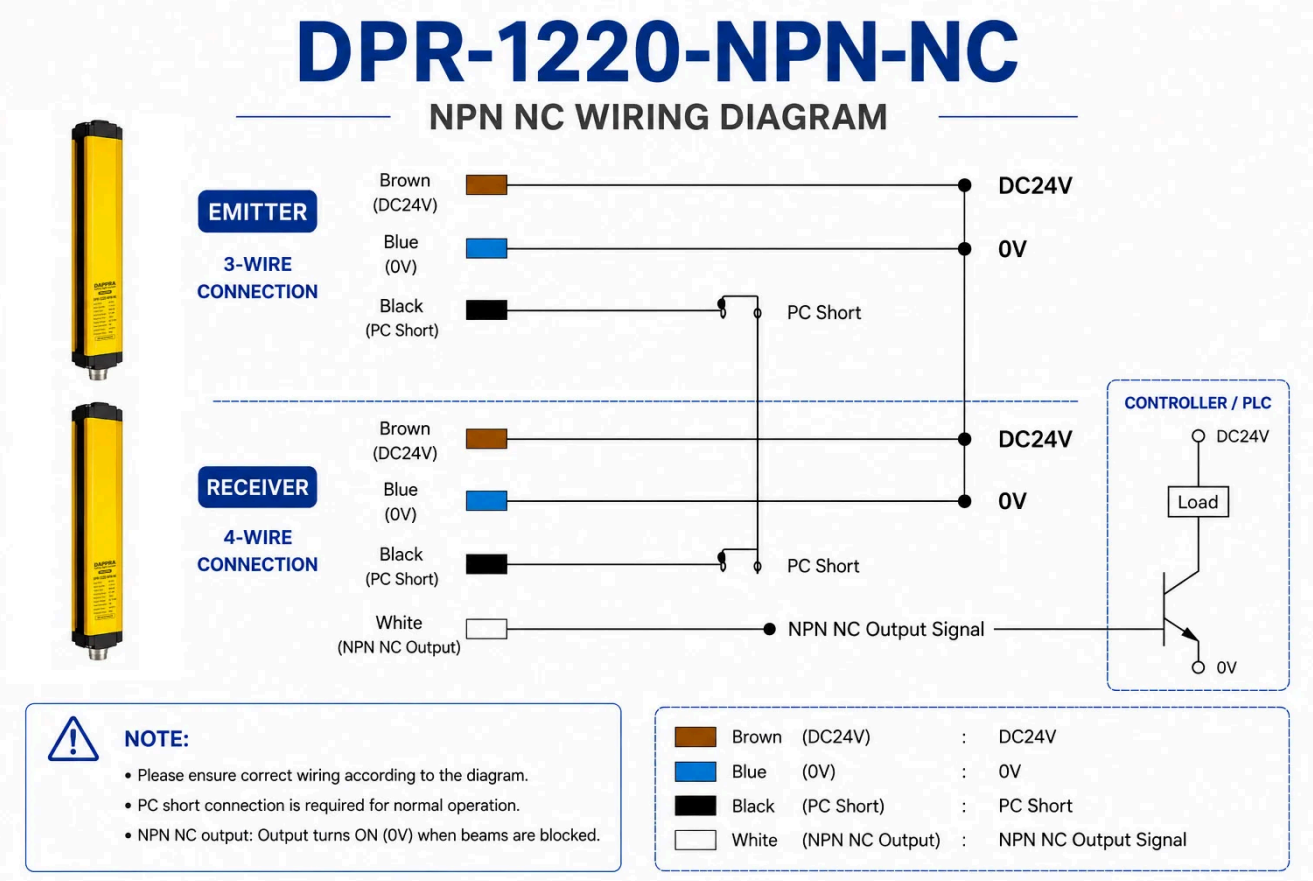
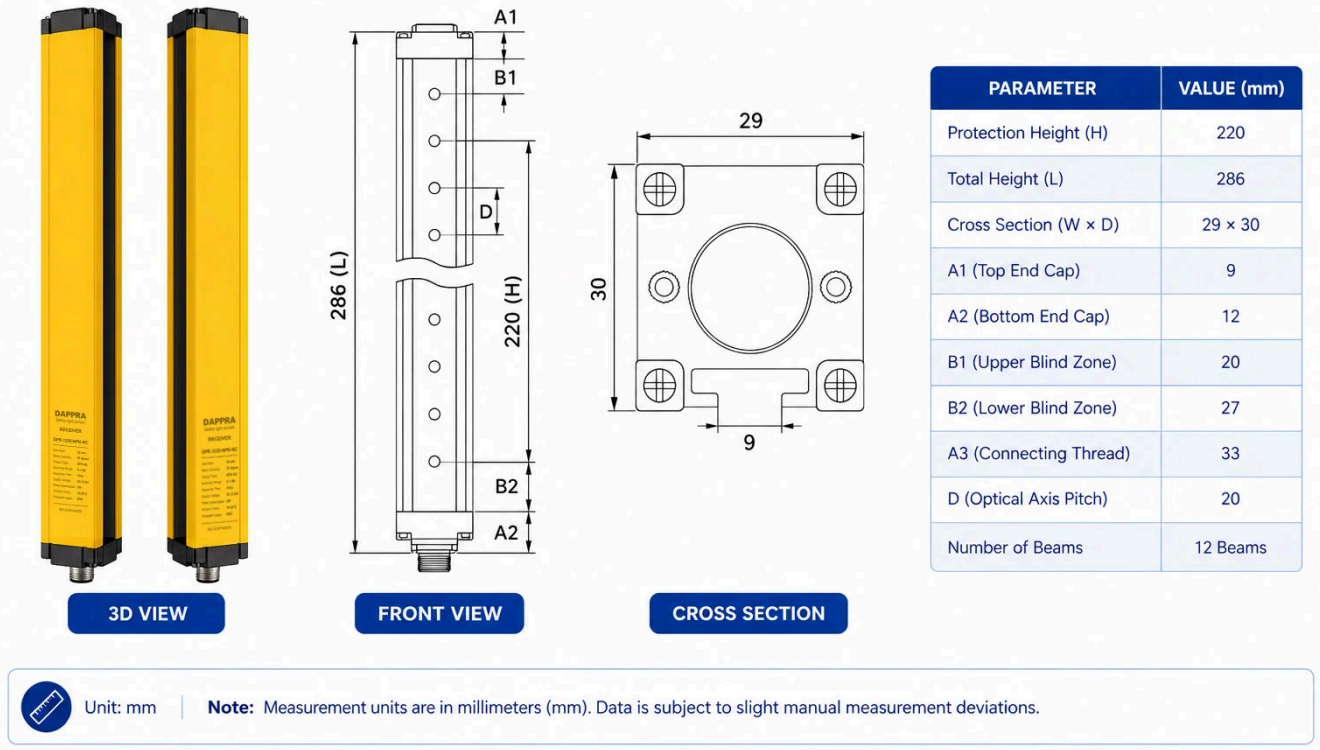



*Figure 3 â€" DPR-1220-NPN-NC NPN NC wiring diagram*

## Mechanical Dimensions

- **220 mm** protection height
- **286 mm** total height
- **29 Ã— 30 mm** housing cross section
- **20 mm** optical axis pitch
- **12** optical beams




| PARAMETER | VALUE (mm) |
|---|---|
| Protection Height (H) | 220 |
| 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) | 27 |
| A3 (Connecting Thread) | 33 |
| D (Optical Axis Pitch) | 20 |
| Number of Beams | 12 Beams |

*Figure 4 â€” DPR-1220-NPN-NC mechanical dimensions*

## Installation Methods

The DPR-1220-NPN-NC supports flexible installation according to different machine structures and protection requirements. The DPR Series supports three installation configurations: standard mounting, side mounting and adjustable mounting.




*Figure 5 â€" DPR-1220-NPN-NC installation options*

## Industrial Applications

The DPR-1220-NPN-NC is designed for industrial automation equipment requiring reliable object detection, machine protection or personnel protection. Its compact 12â€‘beam configuration with a 220 mm protection height makes it suitable for mid-size machine openings, access detection and multi-beam area detection.

**Typical applications include:**

- **Machine area detection** â€” Multi-beam monitoring across a 220 mm zone
- **Object detection** â€” Reliable multi-beam object presence sensing
- **Conveyor monitoring** â€” Material and object detection on conveyor lines
- **Machine entrance monitoring** â€” Detection at machine access points
- **Packaging machinery** â€” Object detection in packaging lines
- **Industrial automation systems** â€” General automation sensing
- **Machine protection** â€” Protection of machine operating zones
- **Personnel protection around machinery** â€” Detection of persons entering protected areas
- **Safety guarding applications** â€” Support for machine safety guarding

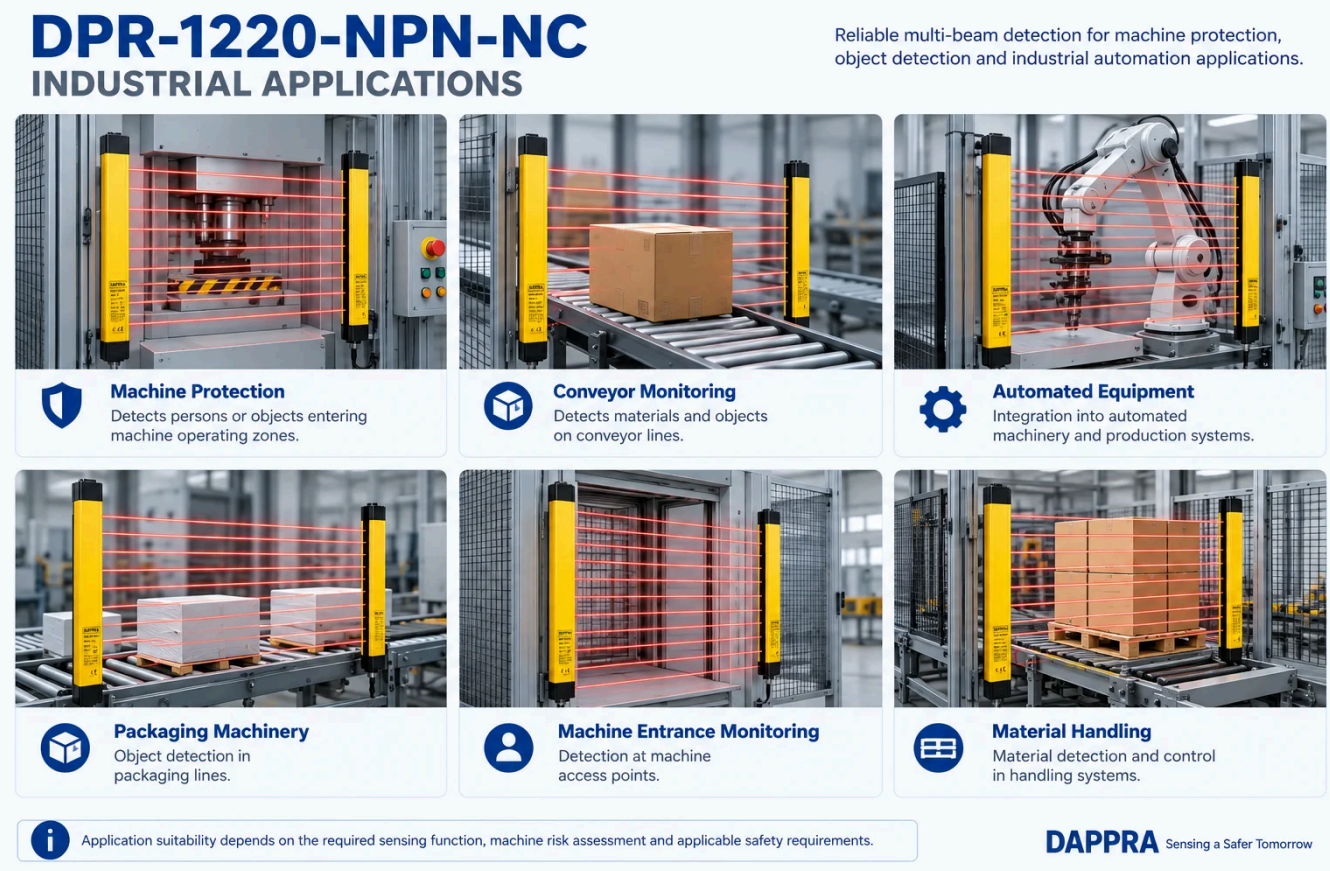



*Figure 6 â€” DPR-1220-NPN-NC industrial applications*

## Industrial Environment Performance

The DPR-1220-NPN-NC is designed for industrial automation environments where equipment may be exposed to humidity, water, oil contamination, mechanical vibration and electromagnetic interference.

**Key environmental protection features include:**

- **IP65 protection** â€” Dust and water resistance for industrial environments
- **Humidity resistance** â€” Reliable operation in highâ€‘humidity conditions
- **Oil protection** â€” Oilâ€‘resistant surface coating
- **Antiâ€‘vibration performance** â€” Stable operation in vibrating machinery
- **Antiâ€‘interference performance** â€” Resistance to electromagnetic interference
- **Ambient light resistance up to 10000 Lux**
- **Operating temperature -10Â°C to +55Â°C**

## Safety & Certification

### SIL 2 Functional Safety Certification

The DPR-1220-NPN-NC is supported by **SIL 2** Functional Safety documentation according to **IEC 61508** through thirdâ€‘party testing and certification. The sensor is designed for both Industrial Area Sensor and Safety Light Curtain applications, including safetyâ€‘related machine protection and personnel protection applications.

| SAFETY PARAMETER | SPECIFICATION |
|---|---|
| **Safety Level** | SIL 2 |
| **Applicable Standard** | IEC 61508 |
| **Certification Type** | Thirdâ€‘Party Functional Safety Certification |

### Product Compliance Documentation

- SIL 2 Functional Safety Certificate

- CE Certification
- FCC Certification
- RoHS Compliance




*Figure 7 â€" DPR-1220-NPN-NC safety and compliance certifications*

## DPR Series Model Selection

The DAPPRA DPR Series Industrial Area Sensor and Safety Light Curtain family includes different configurations based on beam quantity, optical axis pitch and protection height.

| MODEL | BEAMS | PITCH | PROTECTION HEIGHT | TOTAL HEIGHT | OUTPUT | LOGIC |
|---|---|---|---|---|---|---|
| DPR-0620-NPN-NC | 6 | 20 mm | 100 mm | 166 mm | NPN | NC |
| DPR-0820-NPN-NC | 8 | 20 mm | 140 mm | 206 mm | NPN | NC |
| **DPR-1220-NPN-NC** | **12** | **20 mm** | **220 mm** | **286 mm** | **NPN** | **NC** |
| DPR-1620-NPN-NC | 16 | 20 mm | 300 mm | 366 mm | NPN | NC |

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# DPR SERIES AREA SENSOR
## MODEL SELECTION TABLE

Reliable Sensing for a Safer Tomorrow

Select the appropriate model according to the optical axis pitch and protection height.

**Optical Axis Pitch D = 10 mm**

| Beam Quantity | Protection Height (H) mm | Total Height (L) mm | Model |
|---|---|---|---|
| 8 | 70 | 128 | DPR-0810-NPN-NC |
| 10 | 90 | 148 | DPR-1010-NPN-NC |
| 12 | 110 | 168 | DPR-1210-NPN-NC |
| 14 | 130 | 188 | DPR-1410-NPN-NC |
| 16 | 150 | 208 | DPR-1610-NPN-NC |
| 18 | 170 | 228 | DPR-1810-NPN-NC |
| 20 | 190 | 248 | DPR-2010-NPN-NC |
| 22 | 210 | 268 | DPR-2210-NPN-NC |
| 24 | 230 | 288 | DPR-2410-NPN-NC |
| 26 | 250 | 308 | DPR-2610-NPN-NC |
| 28 | 270 | 328 | DPR-2810-NPN-NC |
| 30 | 290 | 348 | DPR-3010-NPN-NC |
| 32 | 310 | 368 | DPR-3210-NPN-NC |
| 34 | 330 | 128 | DPR-3410-NPN-NC |
| 36 | 350 | 168 | DPR-3610-NPN-NC |
| 38 | 370 | 208 | DPR-3810-NPN-NC |
| 40 | 390 | 248 | DPR-4010-NPN-NC |
| 42 | 410 | 288 | DPR-4210-NPN-NC |
| 44 | 430 | 328 | DPR-4410-NPN-NC |
| 46 | 450 | 368 | DPR-4610-NPN-NC |
| 48 | 470 | 408 | DPR-4810-NPN-NC |
| 50 | 490 | 448 | DPR-5010-NPN-NC |
| 52 | 510 | 488 | DPR-5210-NPN-NC |
| 54 | 530 | 528 | DPR-5410-NPN-NC |
| 56 | 550 | 568 | DPR-5610-NPN-NC |
| 58 | 570 | 608 | DPR-5810-NPN-NC |
| 60 | 590 | 648 | DPR-6010-NPN-NC |
| 62 | 610 | 688 | DPR-6210-NPN-NC |
| 64 | 630 | 728 | DPR-6410-NPN-NC |
| 66 | 650 | 768 | DPR-6610-NPN-NC |
| 68 | 670 | 808 | DPR-6810-NPN-NC |
| 70 | 690 | 848 | DPR-7010-NPN-NC |

**Optical Axis Pitch D = 20 mm**

| Beam Quantity | Protection Height (H) mm | Total Height (L) mm | Model |
|---|---|---|---|
| 4 | 60 | 128 | DPR-0420-NPN-NC |
| 6 | 100 | 168 | DPR-0620-NPN-NC |
| 8 | 140 | 208 | DPR-0820-NPN-NC |
| 10 | 180 | 248 | DPR-1020-NPN-NC |
| 12 | 220 | 288 | DPR-1220-NPN-NC |
| 14 | 260 | 328 | DPR-1420-NPN-NC |
| 16 | 300 | 368 | DPR-1620-NPN-NC |
| 18 | 340 | 408 | DPR-1820-NPN-NC |
| 20 | 380 | 448 | DPR-2020-NPN-NC |
| 22 | 420 | 488 | DPR-2220-NPN-NC |
| 24 | 460 | 528 | DPR-2420-NPN-NC |
| 26 | 500 | 568 | DPR-2620-NPN-NC |
| 28 | 540 | 608 | DPR-2820-NPN-NC |
| 30 | 580 | 648 | DPR-3020-NPN-NC |
| 32 | 620 | 688 | DPR-3220-NPN-NC |
| 34 | 660 | 728 | DPR-3420-NPN-NC |
| 36 | 700 | 768 | DPR-3620-NPN-NC |
| 38 | 740 | 808 | DPR-3820-NPN-NC |
| 40 | 780 | 848 | DPR-4020-NPN-NC |
| 42 | 820 | 888 | DPR-4220-NPN-NC |
| 44 | 860 | 928 | DPR-4420-NPN-NC |
| 46 | 900 | 968 | DPR-4620-NPN-NC |
| 48 | 940 | 1008 | DPR-4820-NPN-NC |
| 50 | 980 | 1048 | DPR-5020-NPN-NC |
| 52 | 1020 | 1088 | DPR-5220-NPN-NC |
| 54 | 1060 | 1128 | DPR-5420-NPN-NC |
| 56 | 1100 | 1168 | DPR-5820-NPN-NC |
| 58 | 1140 | 1248 | DPR-5820-NPN-NC |
| 60 | 1180 | 1248 | DPR-6020-NPN-NC |
| 62 | 1220 | 1288 | DPR-6220-NPN-NC |
| 64 | 1260 | 1328 | DPR-6420-NPN-NC |
| 66 | 1300 | 1368 | DPR-6620-NPN-NC |

**Optical Axis Pitch D = 40 mm**

| Beam Quantity | Protection Height (H) mm | Total Height (L) mm | Model |
|---|---|---|---|
| 4 | 120 | 208 | DPR-0440-NPN-NC |
| 6 | 200 | 288 | DPR-0640-NPN-NC |
| 8 | 280 | 368 | DPR-0840-NPN-NC |
| 10 | 360 | 448 | DPR-1040-NPN-NC |
| 12 | 440 | 528 | DPR-1240-NPN-NC |
| 14 | 520 | 608 | DPR-1440-NPN-NC |
| 16 | 600 | 688 | DPR-1640-NPN-NC |
| 18 | 680 | 769 | DPR-1840-NPN-NC |
| 20 | 760 | 848 | DPR-2040-NPN-NC |
| 22 | 840 | 928 | DPR-2240-NPN-NC |
| 24 | 920 | 1008 | DPR-2440-NPN-NC |
| 26 | 1000 | 1088 | DPR-2640-NPN-NC |
| 28 | 1080 | 1168 | DPR-2840-NPN-NC |
| 30 | 1160 | 1248 | DPR-3040-NPN-NC |
| 32 | 1240 | 1328 | DPR-3240-NPN-NC |
| 34 | 1320 | 1408 | DPR-3440-NPN-NC |
| 36 | 1400 | 1488 | DPR-3640-NPN-NC |
| 38 | 1480 | 1568 | DPR-3840-NPN-NC |
| 40 | 1560 | 1648 | DPR-4040-NPN-NC |
| 42 | 1640 | 1728 | DPR-4440-NPN-NC |
| 44 | 1720 | 1808 | DPR-4440-NPN-NC |
| 46 | 1800 | 1888 | DPR-4640-NPN-NC |
| 48 | 1880 | 1968 | DPR-4840-NPN-NC |
| 50 | 1960 | 2048 | DPR-5040-NPN-NC |
| 52 | 2040 | 2128 | DPR-5240-NPN-NC |
| 54 | 2120 | 2208 | DPR-5440-NPN-NC |
| 56 | 2200 | 2288 | DPR-5640-NPN-NC |
| 58 | 2280 | 2368 | DPR-5840-NPN-NC |
| 60 | 2360 | 2448 | DPR-6040-NPN-NC |
| 62 | 2440 | 2528 | DPR-6240-NPN-NC |
| 64 | 2520 | 2608 | DPR-6440-NPN-NC |
| 66 | 2600 | 2688 | DPR-6640-NPN-NC |

**Notes:**

- H:Protection height (effective height of the light curtain)
- L: Total height of the sensor
- All models are NPN output, NC (Normal Close)
- For custom specifications, please contact DAPPRA.



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AREA SENSOR

Through Beam Infrared Detection

*Figure 8 â€” DPR Series model selection chart*

## Manufacturing & Quality

The DPR Series is manufactured by DAPPRA's own production facility with consistent product quality control and customized production requirements.

**Quality assurance processes include:**

- Factory Quality Control â€” Inâ€‘process inspection and monitoring
- 100% Product Inspection â€” Full inspection of every unit

- Functional Testing â€” Performance verification under load
- Incoming Material Inspection â€” Raw material quality verification
- Aging Test â€” Reliability and stability testing
- Final Inspection â€” Preâ€‘shipment quality signâ€‘off

## Technical Resources

| DOCUMENT | DESCRIPTION |
|---|---|
| **Datasheet** | Specifications, wiring, dimensions and certifications |
| **Installation Guide** | Mounting methods and alignment reference |
| **CAD Drawing** | Mechanical dimensions and installation layout |

**Need Technical Support or a Quote?**

Contact DAPPRA Automation for engineering assistance, pricing or OEM/ODM inquiries regarding the DPR-1220-NPN-NC Industrial Area Sensor and Safety Light Curtain.

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