

**OMRON**

# FQ-VISIONSSENSOR

Brukervennlig



» Ett-trykks betjening

» Krystallklare bilder

» Fleksibel plattform

**realizing**

# Enkelt og krystallklart

*Omron starter en ny æra med brukervennlighet og ytelse med den nye serien FQ-visionssensorer. Nå kan du dra nytte av moderne teknologi uten kompliserte betjeningsinstruksjoner eller å ha teknisk kunnskap. Med ett-trykks betjening via PC eller den intuitive TouchFinder-konsollen får du raskt og enkelt tilgang til alle funksjoner og innstillinger. Glimrende bildekvalitet oppnås fra selv de mest utfordrende overflatene, med avanserte behandlingsverktøy. Og fordi FQ-visionssensoren er tilgjengelig i en rekke modeller, slipper du å ta til takke med en modell som har for mange eller for få av de funksjonene du trenger. Derfor vil du garantert finne en modell som passer for deg.*

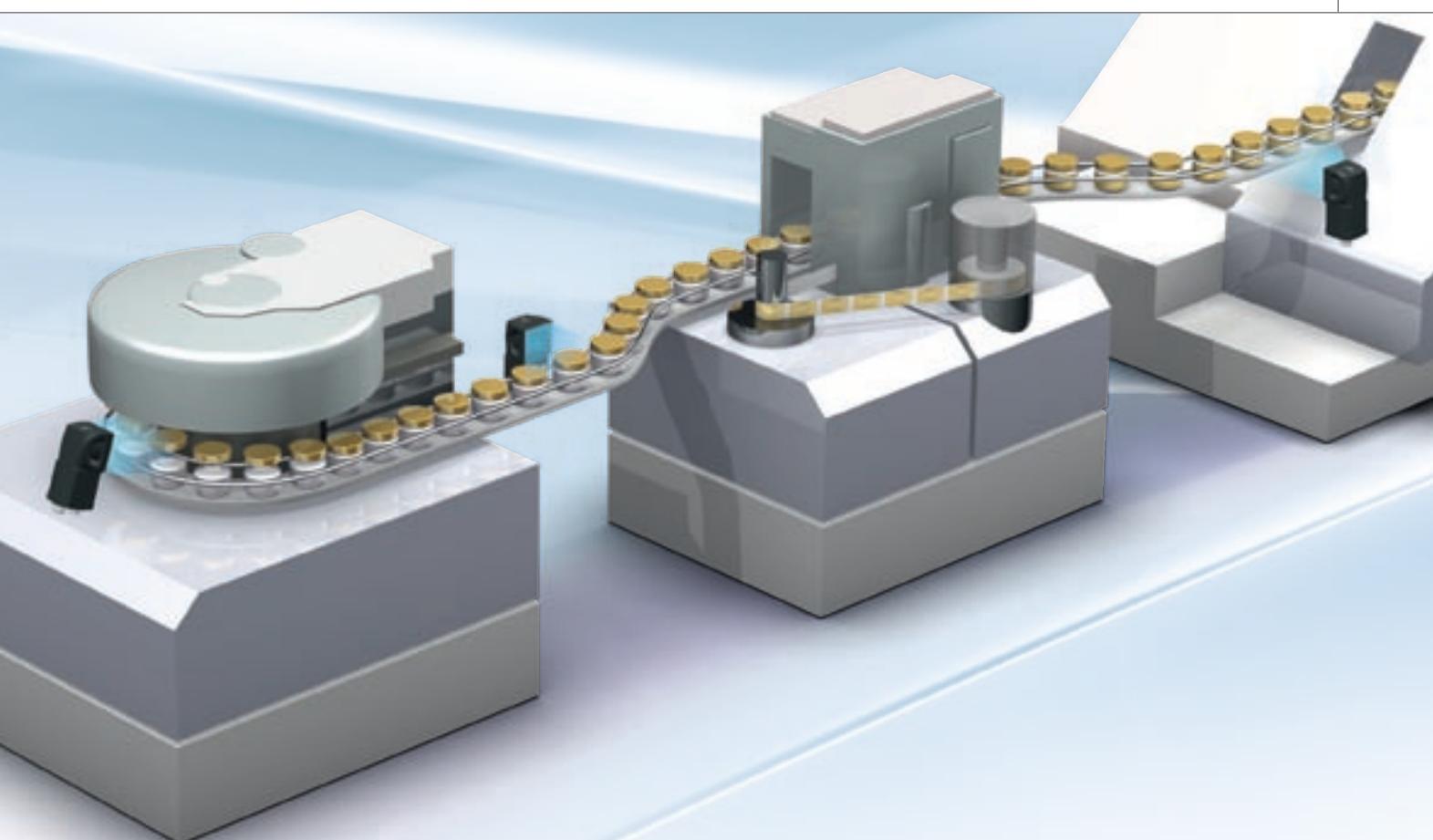
## Funksjoner

- Ett-trykks betjening via en enkel, ikonbasert meny
- Krystallklar bildekvalitet
- Ekte fargebehandling (16 millioner farger)
- Betjening via PC eller TouchFinder-skjerm

## Fordeler

- Enkelt oppsett
- Pålitelige resultater på alle overflater
- Bemerkelsesverdig fleksibilitet – du finner alltid en modell som passer for deg uten at det går ut over bruksområdet ditt





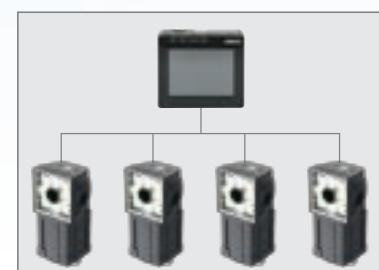
#### Gjør det skarp!

Høy-ytelses LED-skjermer og kraftig filtrering gir klare bilder på selv de vanskeligste overflatene.



#### Enkel navigering

Med den enkle navigeringssmenyen vet du alltid hvordan du ligger an i produksjonen.



#### Fleksibel plattform

Velg den visionssensoren som passer best til bruksområdet ditt, og bestem hvordan du vil bruke den.

## Kompakt og robust

FQ-visionssensoren er den mest kompakte løsningen vår som kombinerer kamera og bildebehandler i ett hus. Det er ikke behov for kostbare og store eksterne lys, takket være den innebygde linsen og en høy-ytelses LED-skjerm. IP67-beskyttelsen gjør også at FQ kan brukes i tøffe omgivelser.

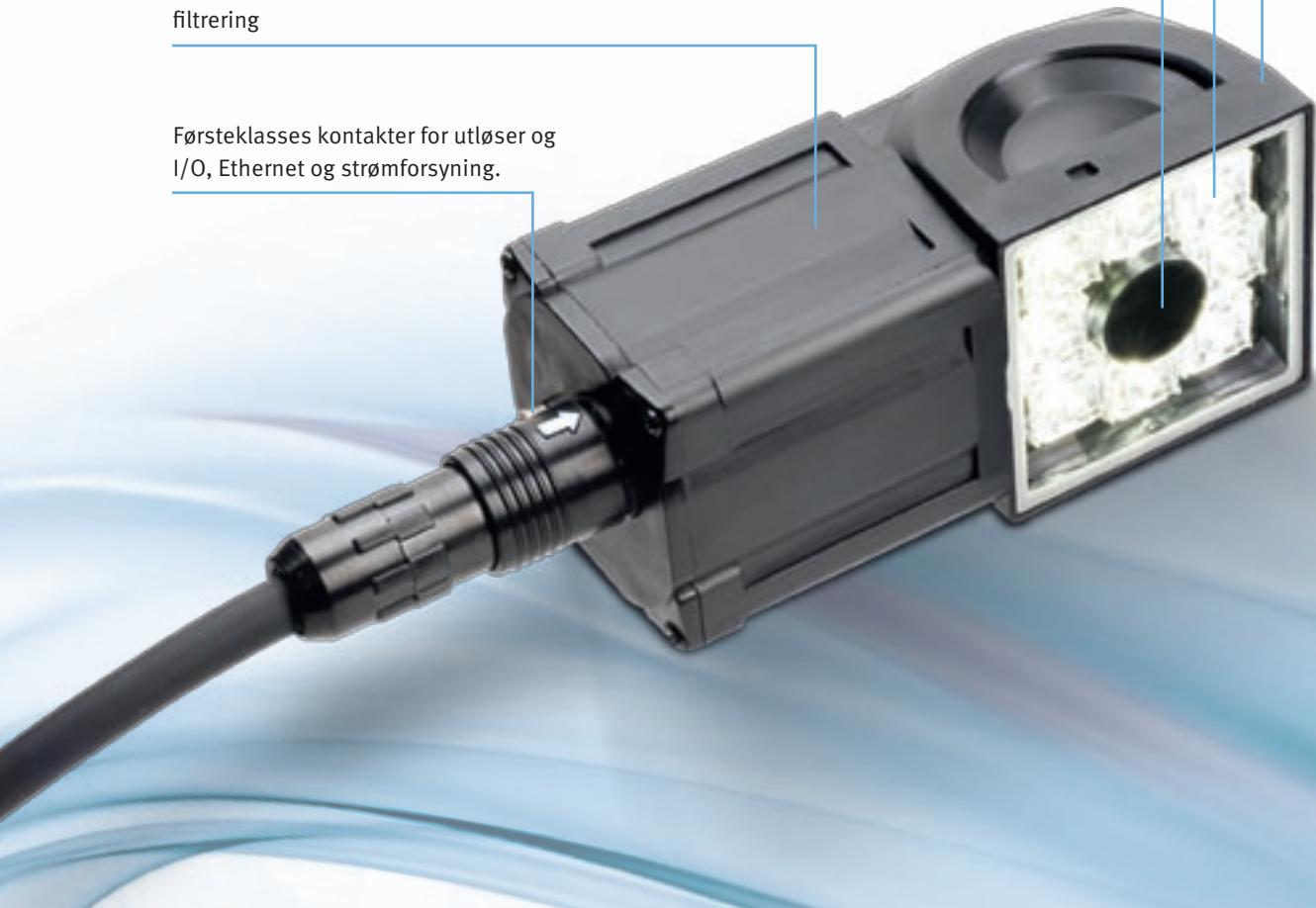
Kompakt størrelse og robust hus – passer i alle maskiner

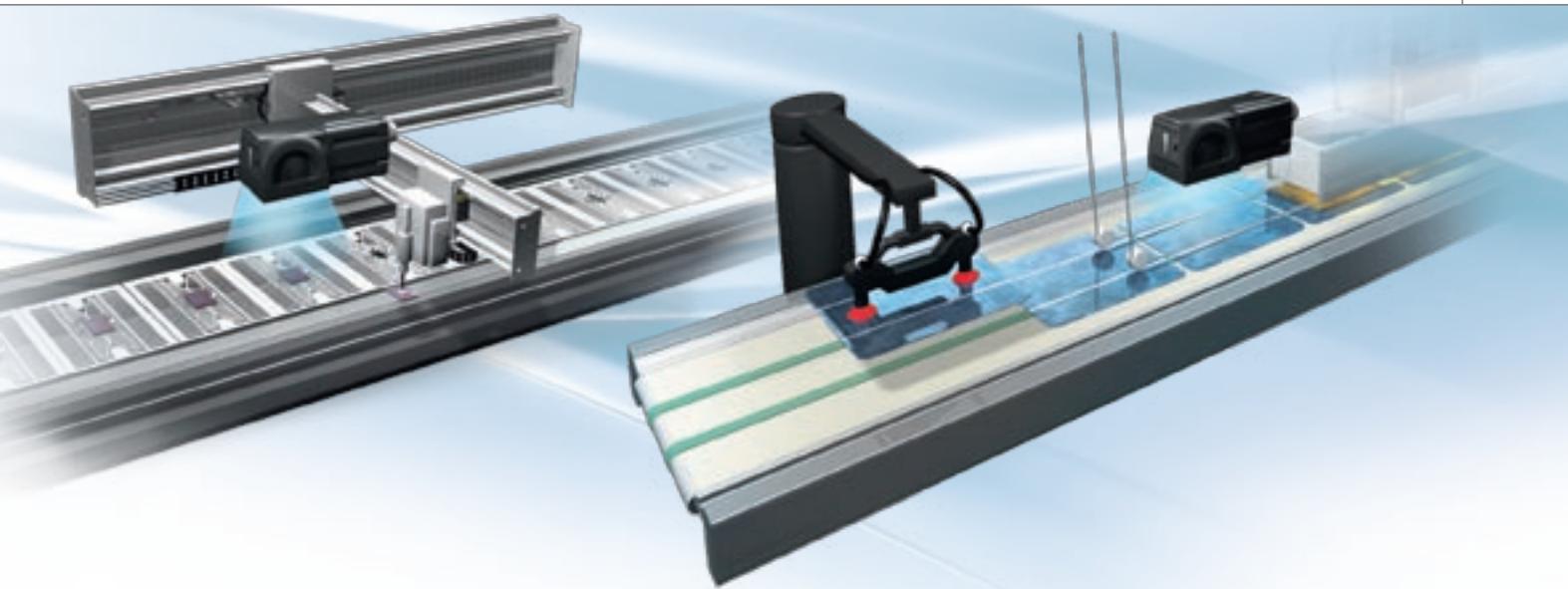
Kraftige LED-skjermer – unike i sin klasse

Innebygd linse – enkel finjustering av kamerafokus

Kraftig bildebehandler – høyhastighetsinspeksjon, glimrende filtrering

Førsteklasses kontakter for utløser og I/O, Ethernet og strømforsyning.





## En ny standard innen bildeklarhet

I tillegg til å være et gjennombrudd når det gjelder enkelhet, gir Omron FQ-visionssensoren deg også det beste innen bildekvalitet og klarhet. For første gang i denne klassen kan du dra fordel av en rekke bilde- og behandlingsfunksjoner. Kraftige LED-skjermer, HDR, polarisering og halasjonsfiltre gir stabil inspeksjon på overflater der vanlige visionssensorer ikke ser noen ting. Det klare bildet gir en enkel installering, siden synsvinkelen ikke er avgjørende lenger.

**Trykkeribransjen:**  
objekter med flere farger



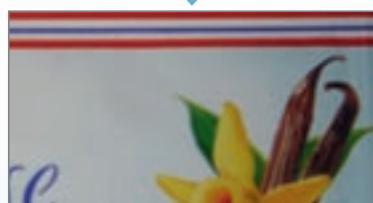
**Elektriske deler:**  
laveste kontrast



**Metallindustri:**  
skinnende og reflekterende



**Ekte fargeregistrering**  
Alle RGB-graderinger (16+ millioner) blir behandlet direkte. Det er ikke behov for gråskalakonvertering eller fargefiltrering.



**Kraftig lys**  
Kontrast var én gang et stort problem innen bildebehandling. Men med FQ-visionssensoren blir hvert bilde lyst og klart med perfekt kontrast for pålitelige resultater.



**HDR-sensor**  
Variasjon i lysforhold kan føre til uønsket blendende lys eller halasjon. HDR minimerer disse effektene og maksimerer stabiliteten til inspekjonsergebnisene og behandler til og med variasjon bit for bit eller feilposisjoner.



# Helt enkelt det mest fleksible produktet av sin type

Fleksibilitet møter enkelhet i Omron FQ-visionssensoren, og innen design møter funksjonalitet brukervennlighet.

FQ, som er passende for alle typer behandling og pakking, kan skreddersys for å oppfylle de mest krevende kravene og alle betjeningskonseptene.

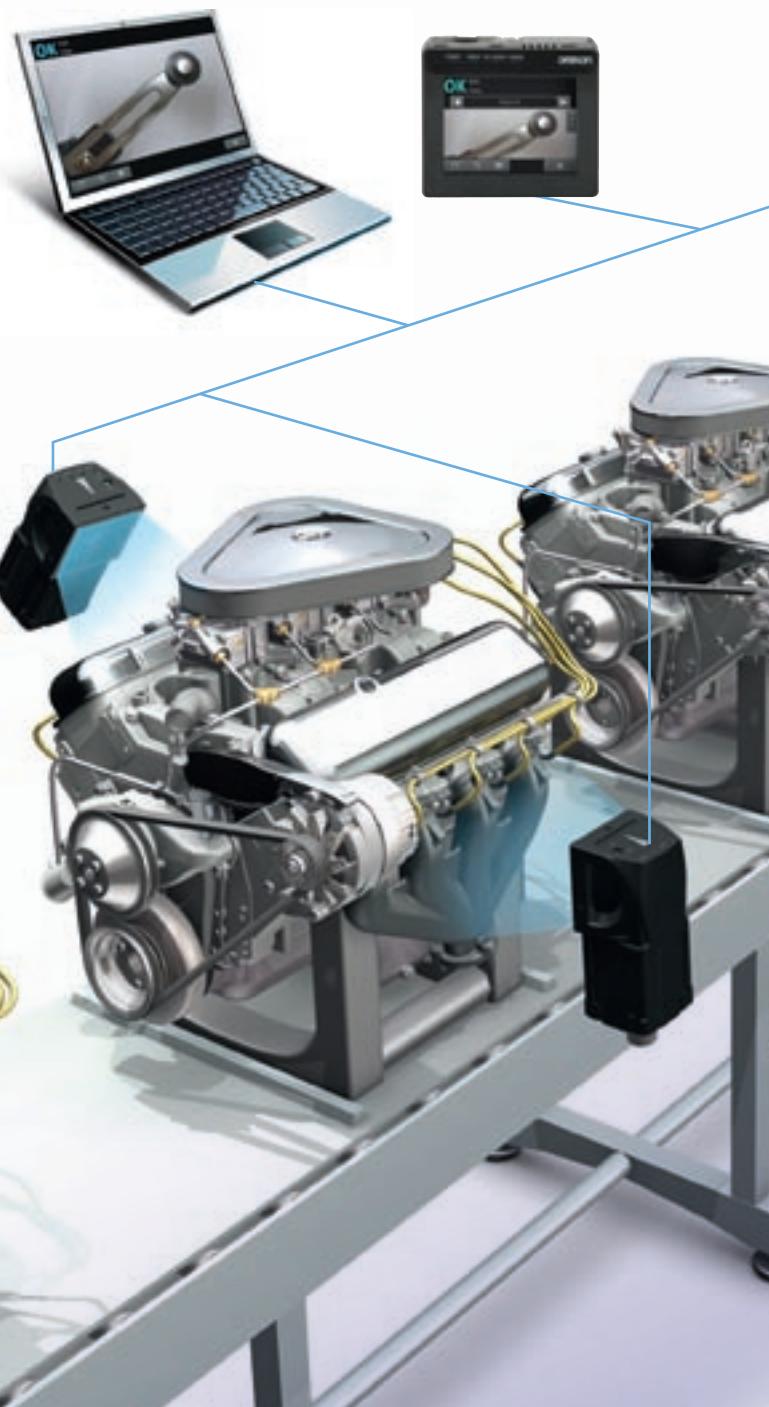
## Du bestemmer oppsett og konfigurering

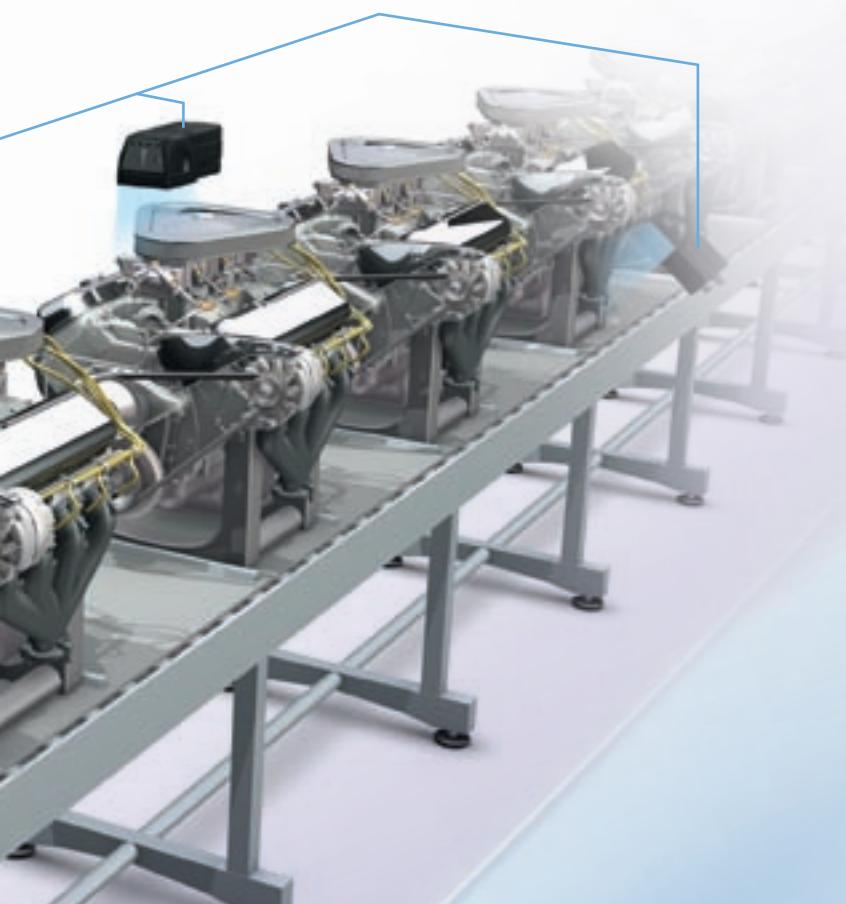
- PC eller frittstående
- Lokal eller ekstern
- Bærbar eller fastmonert
- Permanent eller midlertidig

Du har full kontroll over Omron FQ-visionssensoren, inkludert en bildefeed. Bare koble til Touch-Finder-konsollen eller PC-verktøyet når nødvendig. Velg permanent installasjon på DIN-skinne, eller den bærbare versjonen med oppladbart batteri for total fleksibilitet.

## Flerkontroll - én for alle

Hvis du bruker flere FQ-visionssensorer, kan de kobles sammen og kontrolleres via én TouchFinder eller ett PC-verktøy.

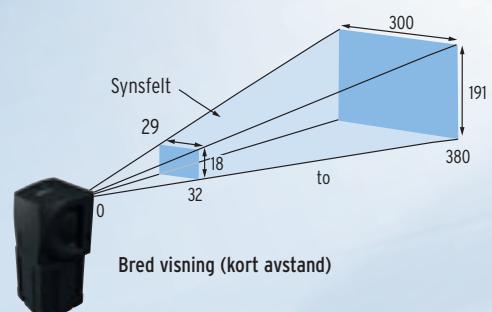
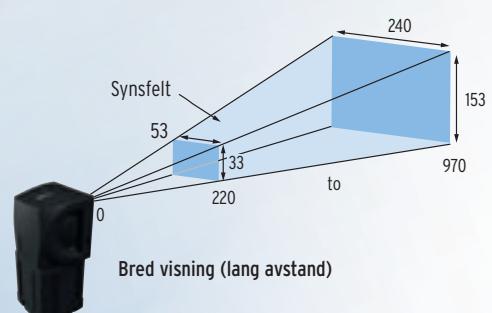
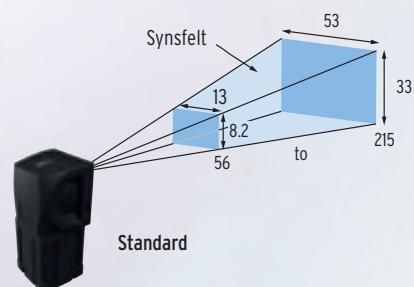
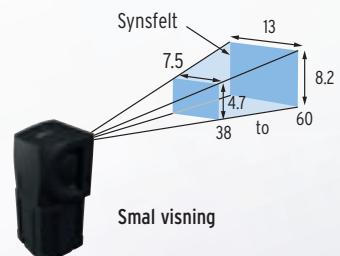




### Tilpass synsfeltet ditt

Uansett hvordan du håndterer store eller små objekter, tilbyr serien med Omron FQ-visionssensorer akkurat det du trenger. Velg FQ-modellen med passende rekkevidde, og tilpass synsfeltet etter dine behov. Fokuseringen kan gjøres raskt og enkelt, slik at du kan bruke sensoren på forskjellige bruksområder.

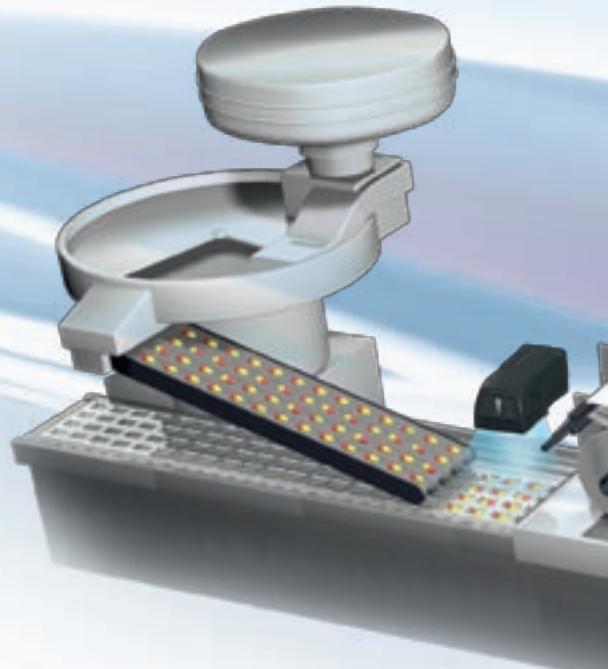
**Stor rekkevidde: synsfelt på 7,5-300 mm.**



# Enkel veiledning

FQ-visionssensoren gir deg en ny dimensjon innen enkel og intuitiv brukerveiledning. Takket være den nyskapende navigeringsmenyen vet du alltid hvor du er. Du blir veiledet trinn for trinn, og du lærer fort hvordan du navigerer deg til hvert element.

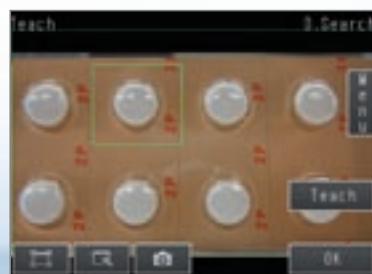
Bruk de kraftige autofunksjonene til FQ for å finne de perfekte innstillingene. La FQ hjelpe deg gjennom det første oppsettet og eventuelle finjusteringer og endringer med konfigureringen. Brukerne trenger ikke være eksperter på bildesensorer, siden behandlingsintelligenten er bygd inn i enheten. Forskjellige visninger av inspekjonseresultater er mulig: oversikt, detaljert, trend eller distribusjon. Visningsalternativene for FQ gir deg de resultatene du trenger for å ta velorienterte avgjørelser om produktet ditt.



## Trykk og start - inspekjonssoppsett



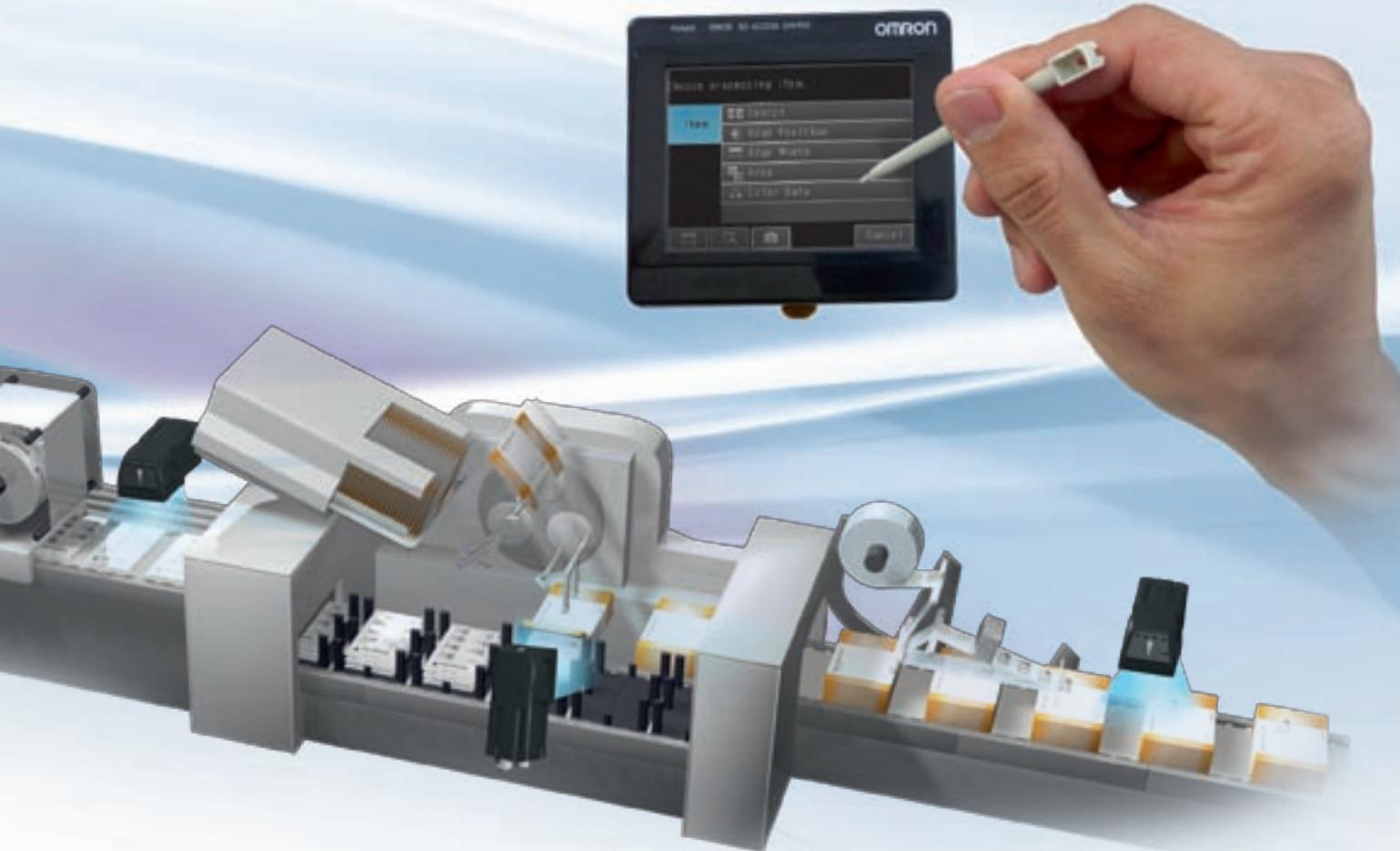
1. Velg elementet som skal inspiseres



2. Lær inn modellen



3. Angi trinn



## Få riktige resultater hver gang, i alle format



### Oversikt over resultater

Vis resultatene for alle inspeksjonselementer i én visning. Naviger direkte til hvert resultat med ett trykk for å se detaljer.

### Trendmonitor

Se historikken til inspeksjonsresultater over tid. Trenden til produksjonskvaliteten kan enkelt overvåkes. Motsettende målinger kan implementeres umiddelbart hvis kvaliteten går ned.

### Histogram

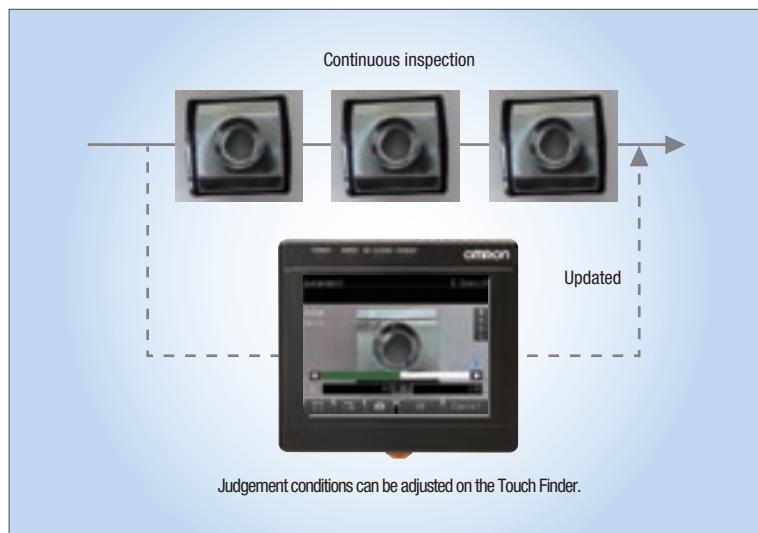
Vis distribusjonen for alle måleresultater, noe som gir deg en øyeblikkelig oversikt over produksjonskvaliteten.

## Trouble-free Operation On Site

### Real-time Threshold Adjustment

The FQ vision sensor allows fast and easy real-time parameter adjustment.

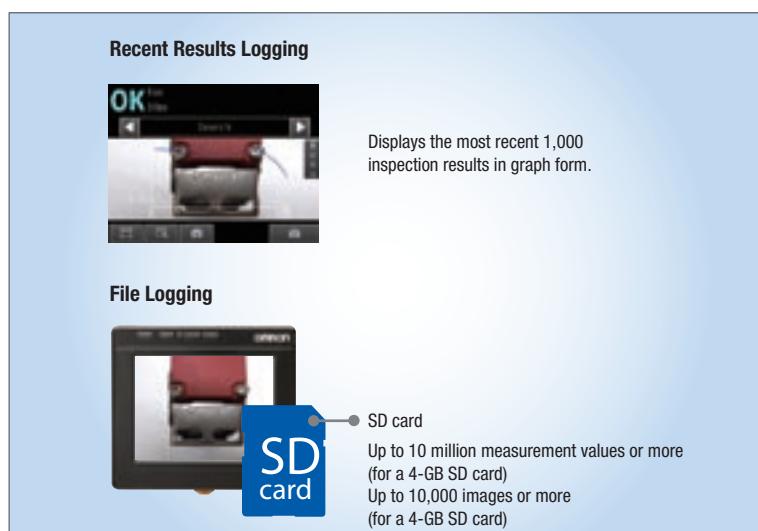
Eliminating the need to stop the machine for fine tuning and optimisation of settings, resulting in zero machine downtime.



### Inspection History Logging

Historical results logging is very useful for testing a new line. Samples are fed down the line and inspection results are logged. The logged data can be checked on a time scale in graph form and used to adjust judgement conditions.

File Logging is convenient during operation. Large inspection histories can be saved in SD cards and used later for traceability.



### Auto Detection

When multiple sensors are connected to the Touch Finder, the display automatically switches to the image of the sensor which has produced an NG result.

This allows dynamic visualisation of reject conditions.

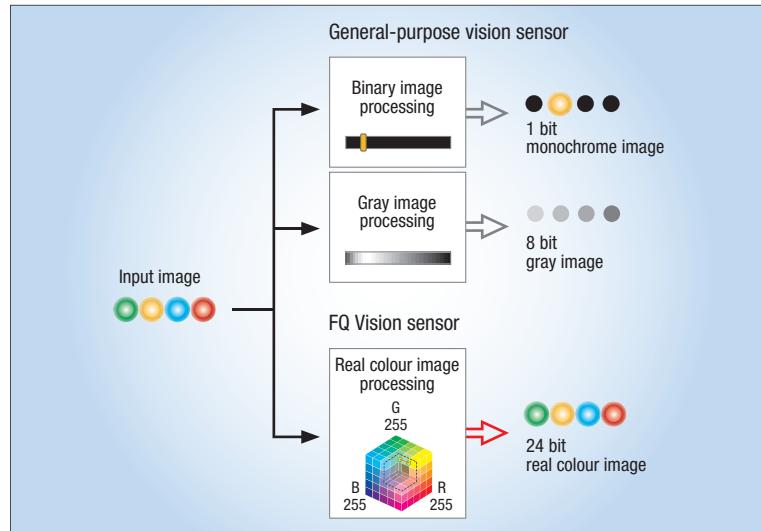


## Authentic Vision Technologies are Gathered on FQ

### Real Colour Sensing

Most vision sensors on the market operate using greyscale image processing, due to the high demand of processing colour images. However, many applications may be unsuitable or unstable using greyscale processing due to the requirement of colour inspection or poor image contrast.

In order to offer solutions for such issues, the FQ vision sensor combines a high power processor unit and real-colour processing technology which enables fast inspections using colour images. The same technology is used in Omron's flagship model of vision sensors and is widely utilised throughout industry.

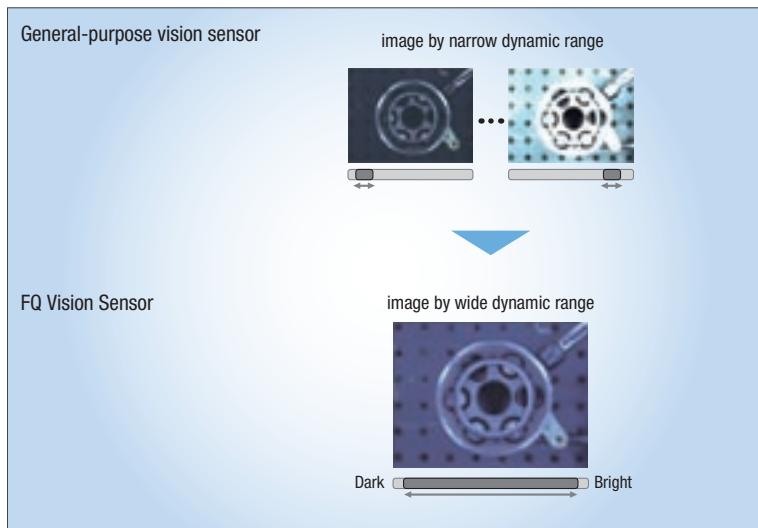


### HDR Sensing

Glossy & highly reflective surfaces can often result in "halation" or uneven brightness across an image, coupled with inconsistent workpiece placement inspections can become unstable and unreliable. Such halation is a result of the narrow dynamic range of standard vision sensors.

The FQ vision sensor uses Omron's High Dynamic Range (HDR) processing technology, which increases the dynamic range of the system up to 16 times that of conventional vision sensors.

The result is stable detection of objects which are highly reflective, even if workpiece placement is not consistent.



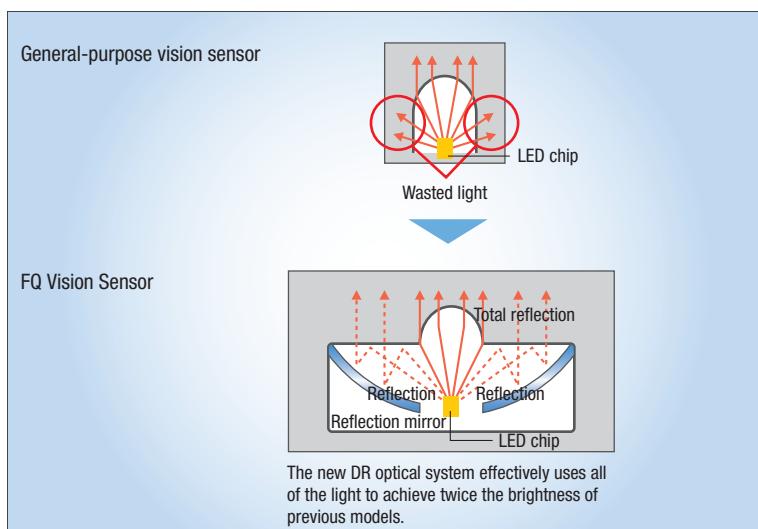
### High Power Lighting

Providing suitable illumination for inspections can often be the deciding factor between application success or failure. Especially when inspecting large field of views, even and consistent lighting can be difficult to achieve.

In order to handle such issues, a new DR optical system has been developed for the FQ vision sensor. This system effectively uses all of the LED light to maintain consistent brightness across the field of view at twice the brightness of previous models.

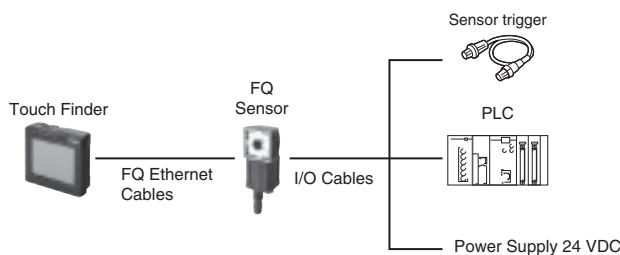
The FQ vision sensor also has a polarisation filter, to cut off the specular reflection light which can result from highly reflective objects, resulting in reliable and consistent inspections.

DR optical system : Double-reflection optical system

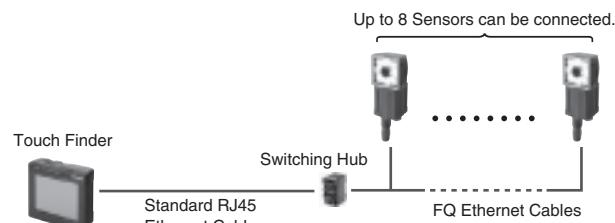


## System Configuration

### Standard Configuration



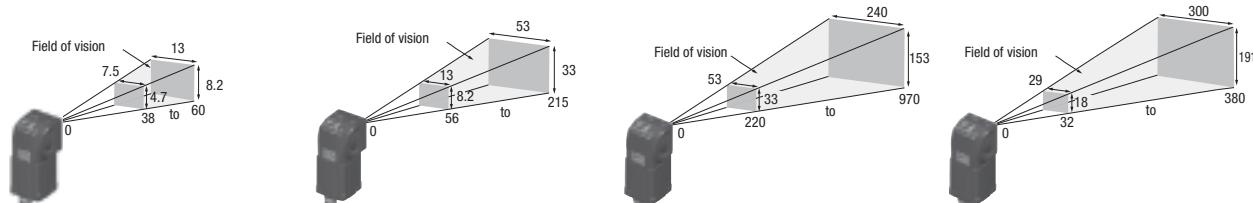
### Multiple Connection



Note: If you register as a member after purchasing a Sensor, you can download free setup software that runs on a PC and can be used in place of the Touch Finder. Refer to the member registration sheet for details.

## Ordering information

### Sensor



| Type | Narrow View            |                 | Standard               |                 | Wide View     |                |                        |                 |
|------|------------------------|-----------------|------------------------|-----------------|---------------|----------------|------------------------|-----------------|
|      | Single-function models | Standard models | Single-function models | Standard models | Long-distance | Short-distance | Single-function models | Standard models |
| NPN  | FQ-S10010F             | FQ-S20010F      | FQ-S10050F             | FQ-S20050F      | FQ-S10100F    | FQ-S20100F     | FQ-S10100N             | FQ-S20100N      |
| PNP  | FQ-S15010F             | FQ-S25010F      | FQ-S15050F             | FQ-S25050F      | FQ-S15100F    | FQ-S25100F     | FQ-S15100N             | FQ-S25100N      |

Note: Tolerance (field of vision):  $\pm 10\%$  max.

### Touch Finder

| Type            | Order code          |
|-----------------|---------------------|
| DC power supply | FQ-D30              |
| AC/DC/battery   | FQ-D31 <sup>1</sup> |

<sup>1</sup> AC Adapter and Battery are sold separately.

### Cables

| Type  | Cable length | Order code |
|---|--------------|------------|
| FQ Ethernet Cables (connect Sensor to Touch Finder, Sensor to PC) | 2 m          | FQ-WN002   |
|   | 10 m         | FQ-WN010   |
|   | 20 m         | FQ-WN020   |
| I/O Cables  | 2 m          | FQ-WD002   |
|   | 10 m         | FQ-WD010   |
|   | 20 m         | FQ-WD020   |

### Industrial switching hubs (Recommended)

| Appearance | Number of ports | Failure detection | Current consumption | Order code |
|------------|-----------------|-------------------|---------------------|------------|
|            | 3               | None              | 0.08 A              | W4S1-03B   |
|            | 5               | None              | 0.12 A              | W4S1-05B   |
|            |                 | Supported         |                     | W4S1-05C   |

### Accessories

| Application      | Appearance | Name  | Order code          |
|------------------|------------|---|---------------------|
| For Sensor       |            | Mounting Bracket (enclosed with Sensor)             | FQ-XL               |
|                  |            | Polarizing Filter Attachment (enclosed with Sensor) | FQ-XF1              |
| For Touch Finder |            | Panel Mounting Adapter                              | FQ-XPM              |
|                  |            | AC Adapter (for models for DC/AC/Battery)           | FQ-AC_ <sup>1</sup> |
|                  |            | Battery (for models for DC/AC/Battery)              | FQ-BAT1             |
|                  |            | Touch Pen (enclosed with Touch Finder)              | FQ-XT               |
|                  |            | Strap   | FQ-XH               |

<sup>1</sup> AC Adapters for Touch Finder with DC/AC/Battery Power Supply. Select the model for the country in which the Touch Finder will be used.

| Plug type | Voltage    | Certified standards | Order code |
|-----------|------------|---------------------|------------|
| C         | 250 V max. | Europlug            | FQ-AC4     |
| BF        | 250 V max. | UK                  | FQ-AC5     |

## Specifications

| Item                   | Type                               | Single-function models   | Standard models |
|------------------------|------------------------------------|--|-----------------|
| Model                  | NPN                                | FQ-S10   | FQ-S20          |
|                        | PNP                                | FQ-S15   | FQ-S25          |
| Field of vision        |                                    | Refer to the table below.  |                 |
| Installation distance  |                                    | Refer to the table below.  |                 |
| Main functions         | Inspection items                   | Search, area, average colour, edge position, and edge width  |                 |
|                        | Number of simultaneous inspections | 1  | 32              |
|                        | Position compensation              | None   | Supported       |
|                        | Number of registered scenes        | 8  | 32              |
| Image input            | Image processing method            | Real colour  |                 |
|                        | Image filter                       | High dynamic range (HDR), polarizing filter (attachment), and white balance  |                 |
|                        | Image elements                     | 1/3-inch colour CMOS   |                 |
|                        | Shutter                            | 1/250 to 1/30,000  |                 |
|                        | Processing resolution              | 752 x 480  |                 |
| Lighting               | Lighting method                    | Pulse  |                 |
|                        | Lighting colour                    | White  |                 |
| Data logging           | Measurement data                   | In Sensor: 1,000 items (If a Touch Finder is used, results can be saved up to the capacity of an SD card.)   |                 |
|                        | Images                             | In Sensor: 20 images (If a Touch Finder is used, images can be saved up to the capacity of an SD card.)  |                 |
| Measurement trigger    |                                    | External trigger (single or continuous)  |                 |
| I/O specifications     | Input signals                      | 7 signals <ul style="list-style-type: none"> <li>• Single measurement input (TRIG)</li> <li>• Command input (IN0 to IN5)</li> </ul>  |                 |
|                        | Output signals                     | 3 signals <ul style="list-style-type: none"> <li>• Control output (BUSY)</li> <li>• Overall judgement output (OR)</li> <li>• Error output (ERROR)</li> </ul> <p>Note: The three output signals can be allocated for the judgements of individual inspection items.</p> |                 |
|                        | Ethernet specification             | 100BASE-TX/10BASE-T  |                 |
|                        | Connection method                  | Special connector cables <ul style="list-style-type: none"> <li>• Power supply and I/O: 1 cable</li> <li>• Touch Finder and computer: 1 cable</li> </ul>   |                 |
| Ratings                | Power supply voltage               | 20.4 to 26.4 VDC (including ripple)  |                 |
|                        | Current consumption                | 2.4 A max.   |                 |
| Environmental immunity | Ambient temperature range          | Operating: 0 to 50°C<br>Storage: -25 to 65°C<br>(with no icing or condensation)  |                 |
|                        | Ambient humidity range             | Operating and storage: 35% to 85% (with no condensation)   |                 |
|                        | Ambient atmosphere                 | No corrosive gas   |                 |
|                        | Degree of protection               | IEC 60529 IP67 (with polarizing filter attachment mounted.)  |                 |
| Materials              | Sensor                             | PBT, PC, SUS   |                 |
|                        | Mounting Bracket                   | PBT  |                 |
|                        | Polarizing Filter Attachment       | PBT, PC  |                 |
|                        | Ethernet connector                 | Oil-resistance vinyl compound  |                 |
|                        | I/O connector                      | Lead-free heat-resistant PVC   |                 |
| Weight                 |                                    | Depends on field of vision and installation distance. Refer to the table below.  |                 |
| Accessories            |                                    | <ul style="list-style-type: none"> <li>• Mounting Bracket (FQ-XL) (1)</li> <li>• Polarizing Filter Attachment (FQ-XF1) (1)</li> <li>• Instruction Manual</li> <li>• Quick Startup Guide</li> <li>• Member registration sheet</li> </ul>                                |                 |

| Single-function models |            | Standard models |            | Field of view <sup>*1</sup><br>(Horizontal x Vertical) | Installation distance              | Weight        |
|------------------------|------------|-----------------|------------|--|------------------------------------|---------------|
| NPN                    | PNP        | NPN             | PNP        |  |                                    |               |
| FQ-S10010F             | FQ-S15010F | FQ-S20010F      | FQ-S25010F | 7.5x4.7 to 13x8.2 mm                                   | 38 to 60 mm                        | Approx. 160 g |
| FQ-S10050F             | FQ-S15050F | FQ-S20050F      | FQ-S25050F | 13x8.2 to 53x33 mm                                     | 56 to 215 mm                       | Approx. 160 g |
| FQ-S10100F             | FQ-S15100F | FQ-S20100F      | FQ-S25100F | 53x33 to 240x153 mm                                    | Long-distance model: 220 to 970 mm | Approx. 150 g |
| FQ-S10100N             | FQ-S15100N | FQ-S20100N      | FQ-S25100N | 29x18 to 300x191 mm                                    | Short-distance model: 32 to 380 mm | Approx. 150 g |

<sup>\*1</sup> Tolerance: ±10% max.

## Touch Finder

| Item                                 |   | Model with DC power supply<br>FQ-D30   | Model with AC/DC/battery power supply<br>FQ-D31 |  |
|--------------------------------------|---|--|---|--|
| <b>Number of connectable Sensors</b> | 8 max.  |  |   |  |
| <b>Main functions</b>                | <b>Types of measurement displays</b>                | Last result display, Last NG display, trend monitor, histograms                                      |   |  |
|                                      | <b>Types of display images</b>                      | Through, frozen, zoom-in, and zoom-out images  |   |  |
|                                      | <b>Data logging</b>                                 | Measurement results, measured images   |   |  |
|                                      | <b>Menu language</b>                                | English, German, French, Italian, Spanish, Traditional Chinese, Simplified Chinese, Korean, Japanese |   |  |
| <b>Indications</b>                   | <b>LCD</b>  | <b>Display device</b>  | 3.5-inch TFT colour LCD                         |  |
|                                      |   | <b>Pixels</b>  | 320 x 240                                       |  |
|                                      |   | <b>Display colours</b>   | 16,777,216                                      |  |
|                                      | <b>Backlight</b>                                    | <b>Life expectancy<sup>*1</sup></b>  | 50,000 hours at 25°C                            |  |
|                                      |   | <b>Brightness adjustment</b>   | Provided  |  |
|                                      |   | <b>Screen saver</b>  | Provided  |  |
| <b>Operation interface</b>           | <b>Touch screen</b>                                 | <b>Method</b>  | Resistance film                                 |  |
|                                      |   | <b>Life expectancy<sup>*2</sup></b>  | 1,000,000                                       |  |
| <b>External interface</b>            | <b>Ethernet</b>                                     | 100BASE-TX/10BASE-T  |   |  |
|                                      | <b>SD card</b>                                      | SDHC-compliant, Class 4 or higher recommended  |   |  |
| <b>Ratings</b>                       | <b>Power supply voltage</b>                         | DC power connection: 20.4 to 26.4 VDC (including ripple)   |   |  |
|                                      |   | AC adapter connection: 100 to 240 VAC, 50/60 Hz  |   |  |
|                                      | <b>Continuous operation on Battery<sup>*3</sup></b> | Battery connection: FQ-BAT1 Battery  |   |  |
| <b>Environmental immunity</b>        | <b>Ambient temperature range</b>                    | Operating: 0 to 50°C<br>Storage: -25 to 65°C<br>(with no icing or condensation)                      |   |  |
|                                      | <b>Ambient humidity range</b>                       | Operating and storage: 35% to 85% (with no condensation)   |   |  |
|                                      | <b>Ambient atmosphere</b>                           | No corrosive gas   |   |  |
| <b>Weight</b>                        | <b>Degree of protection</b>                         | IEC 60529 IP20 (when SD card cover, connector cap, or harness is attached)                           |   |  |
|                                      |   |  |   |  |
|                                      |   | Approx. 270 g (without Battery and hand strap attached)  |   |  |
|                                      |   |  |   |  |
| <b>Materials</b>                     |   | Case: ABS, Hand strap: Nylon   |   |  |
| <b>Accessories</b>                   |   | Touch Pen (FQ-XT), Instruction Manual  |   |  |

<sup>\*1</sup> This is a guideline for the time required for the brightness to diminish to half the initial brightness at room temperature and humidity. The life of the backlight is greatly affected by the ambient temperature and humidity and will be shorter at lower or higher temperatures.

<sup>\*2</sup> This value is only a guideline. No guarantee is implied. The value will be affected by operating conditions.

<sup>\*3</sup> This value is only a guideline. No guarantee is implied. The value will be affected by the operating environment and operating conditions.

## Battery Specifications

| Item                                    | FQ-BAT1  |
|---|--|
| <b>Battery type</b>                     | Secondary lithium ion battery  |
| <b>Nominal capacity</b>                 | 1,800 mAh  |
| <b>Rated voltage</b>                    | 3.7V   |
| <b>Ambient temperature range</b>        | Operating: 0 to 40°C<br>Storage: -25 to 65°C (with no icing or condensation) |
| <b>Ambient humidity range</b>           | Operating and storage: 35% to 85% (with no condensation)                     |
| <b>Charging method</b>                  | Charged in Touch Finder (FQ-D31). AC adapter (FQ-AC_) is required.           |
| <b>Charging time<sup>*1</sup></b>       | 2.5 h  |
| <b>Battery backup life<sup>*2</sup></b> | 300 charging cycles  |
| <b>Weight</b>                           | 50 g max.  |

<sup>\*1</sup> This value is only a guideline. No guarantee is implied. The value will be affected by operating conditions

<sup>\*2</sup> This is a guideline for the time required for the capacity of the Battery to be reduced to 60% of the initial capacity. No guarantee is implied. The value will be affected by the operating environment and operating conditions.

## System Requirements for PC tool for FQ

The following Personal Computer system is required to use the software.

|                |  |
|----------------|--|
| <b>OS</b>      | Microsoft Windows XP Home Edition/Professional SP2 or higher <sup>*1</sup><br>Microsoft Windows 7 Home Premium or higher <sup>*1</sup> |
| <b>CPU</b>     | Core 2 Duo 1.06 GHz or the equivalent or higher  |
| <b>RAM</b>     | 1GB min.   |
| <b>HDD</b>     | 500 MB min. available space <sup>*2</sup>  |
| <b>Monitor</b> | 1,024 x 768 dots min.  |

<sup>\*1</sup> The Japanese and English versions support only 32-bit OS versions.

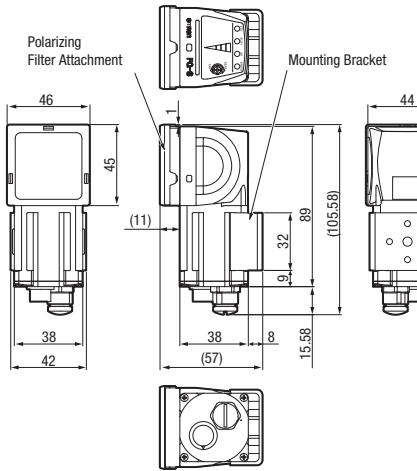
<sup>\*2</sup> Available space is also required separately for data logging.

## Dimensions

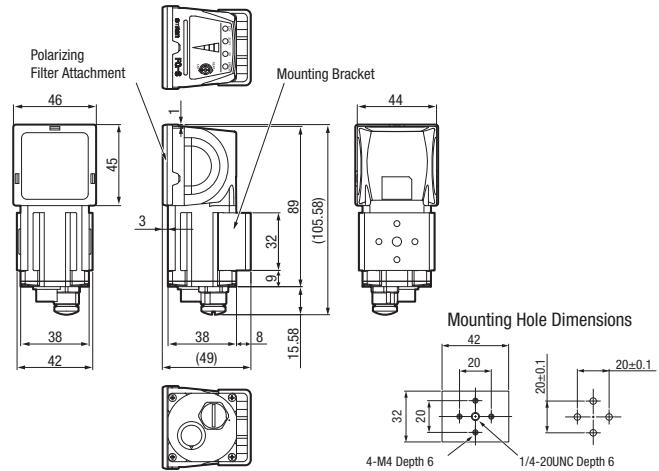
(Unit: mm)

### Sensor

FQ-S10010F/-S10050F/-S15010F/-S15050F  
FQ-S20010F/-S20050F/-S25010F/-S25050F

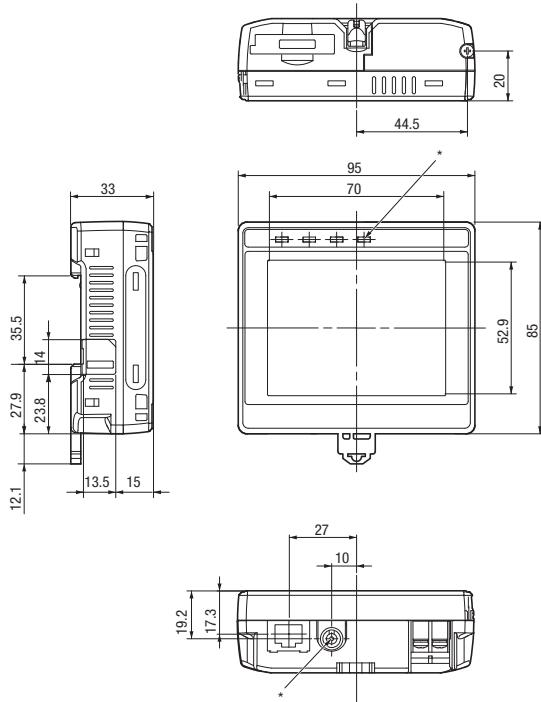


FQ-S10100F/-S10100N/-S15100F/-S15100N  
FQ-S20100F/-S20100N/-S25100F/-S25100N

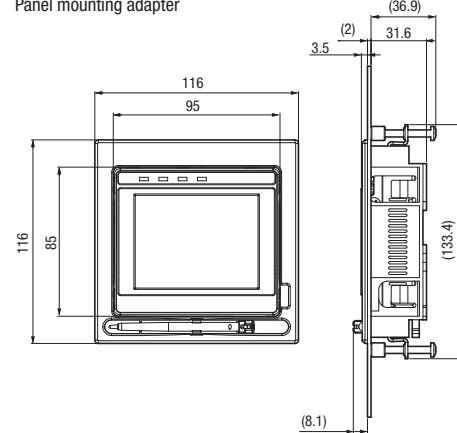


### Touch Finder

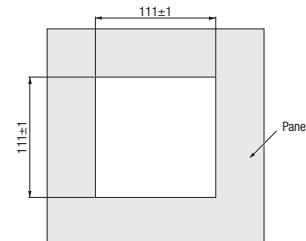
FQ-D30/-D31



Panel mounting adapter



Panel cutout dimensions



\* Provided with FQ-D31 only.

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- Programmerbare logiske styringsenheter (PLS)
- Operatørpaneler (HMI)
- Ekstern I/O
- Industri-PCer
- Programvare

#### Motion & Drives

- Bevegelseskontrollere
- Servosystemer
- Frekvensomformere

#### Kontrollkomponenter

- Temperaturregulatorer
- Strømforsyninger
- Tidsreléer
- Tellere
- Programmerbare reléer
- Digitale panelinstrumenter
- Elektromekaniske reléer
- Overvåkningsprodukter
- Solid state-reléer
- Grensebrytere
- Trykknappbrytere
- Lavspennings bryterutstyr

#### Sensorer og sikkerhet

- Fotoelektriske sensorer
- Induktive sensorer
- Kapasitive sensorer og trykksensorer
- Kabelkontakter
- Nøyaktighets- og breddemålingssensorer
- Visuelle systemer
- Sikkerhetsnettverk
- Sikkerhetssensorer
- Sikkerhetselementer
- Sikkerhetsdør-/låsbrytere