The shortage of skilled labor in recent years has proven to be a real challenge for the machine tools industry. In order to provide the necessary solutions, three key trends — automation, digitization, and multifunctionality — require major changes that draw on a wide spectrum of advanced technologies such as robotics, AI, and IoT.
Machine Tools and IDEC

OPERATOR SAFETY FIRST
Interlocking devices are the most critical component in machine tool safety. IDEC products meet the requirements of international safety standards and have the sturdiness and durability to stand up to the machine tool use environment. In keeping with the emerging trend toward automation, even in machine tool peripheral devices, we can supply safety edge switches, safety laser scanners, and other products geared to the new needs automation presents, helping to boost machine tool safety.

BUILT TO LAST
IDEC has spent more than 75 years developing and improving products with a constant focus on ease of use and quality. Our lengthy experience in the machine tools industry has made us acutely aware of the environmental resistance and durability needed to withstand a demanding environment as we continue to hone our product quality. IDEC is the trusted brand of many customers in the industry, and many of our products are used in machine tools worldwide.

COMPOUND SYSTEM SOLUTIONS
High-level automation solutions, for not only machine tools but also peripheral equipment, are now being explored as an answer to worldwide labor shortages. IDEC is using the product and safety knowhow that we have developed in robotics, material handling, and other industries to help machine tool manufacturers pursue automation and increase safety.
New proposals for evolving machine tool operations

Ensures machine safety in compliance with international standards

10 Enabling Switches
   HE Series

11 Interlock Switches with Solenoid
   HS1T

12 Interlock Switches with Solenoid
   HSS5L

14 Safety Laser Scanner
   SE2L

15 Safety Grip Switches
   HE2G

17 LED SignaLight Towers
   LD6A

18 Interlock Switches
   HE Series

3 Interlock Switches with Solenoid
   HS5L

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Panel products for enhancing production efficiency by reducing wiring

- Smart RFID Reader KW2D
- Emergency Stop Switches X Series
- Push-in Switches & Pilot Lights HW / CW Series
- 22 Flush Silhouette Switches CW Series USB/RJ45 Ports
- Small Joysticks TS / 3000 Series
- Metal Switches AV / Piezo Series
- Tactile Switches Multimec™ Series
- Pushbuttons IP / IS Series
- Operator Interfaces HG Series

Slim Relays / Universal Relays RU / RJ / RV8

LED Lightings LF1B-N / LF2B

Interlock Switches HSS5D

Force Guided Relays RF2
New Products

KW2D
Smart RFID Readers

Smart user authority control and log management with RFID

- Can be used as an ISO16090 MSO access device to assign user authority according to the skill level of the worker.
- Standard ø22mm panel cut-out enables easy installation.
- Device equipped with verification function. Easy tag registration using a software program.
- Ethernet communication (Modbus TCP, EtherNet/IP, CC-Link IE Field Basic) allows easy communication with existing devices.

<table>
<thead>
<tr>
<th>Series</th>
<th>Model</th>
<th>Rated Input Voltage</th>
<th>Operating Temperature</th>
<th>Storage Temperature</th>
<th>RFID Interface Specification</th>
<th>Supported Tags Card</th>
<th>KEYFOB</th>
</tr>
</thead>
<tbody>
<tr>
<td>KW2D</td>
<td>Without holder: KW2D-R10004E</td>
<td>24V DC</td>
<td>-25 to +55°C</td>
<td>Front unit: IP65/67 Back unit: IP20</td>
<td>ISO/IEC14443 Type A (Type A), ISO/IEC18092 (Type F), JIS X6319-4 (Type F), ISO/IEC 15693 (Type V)</td>
<td>ISO/IEC14443 Type A, ISO/IEC18092, JIS X6319-4, ISO/IEC15693</td>
<td>ISO/IEC14443 Type A</td>
</tr>
<tr>
<td></td>
<td>With holder: KW2D-RH10004E</td>
<td>2.4W max.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Authority control for machine and devices

BEFORE

Anyone can operate the machine

AFTER

Prevents inadvertent operations and setting changes, and prevents dangerous situations for operators.

An RFID reader is mounted on an operation panel with ø22mm panel cut-out. The reader is then used to register workers and authenticate their ID cards.
**New Products**

**LF3D**

**LED Lighting**

**Robust, excellent environmental resistance, and uniform light distribution**

- IDEC’s lineup of products offer light distribution characteristics (condensing lens, diffusing lens) for various applications. **Wide-angle, bright illumination** sheds light on a wide area from blade edges to pallets.
- **Compact and lightweight**, saves space inside machines.
- **IP67G** rated to withstand harsh environment inside machine tools.
- Designed to reduce **multi shadows** and reflections from light sources on workpieces.
- Equipped with a **glare save** function to dim brightness by half, reducing glare to the operator during maintenance.
- **M12** connector types available.

**Coming Soon**

**Safety Commander™**

**Tablet Mount Safety Device**

**Safety functions (emergency stop switch / enabling switch) added to commercially available tablets** for use as a remote controller or teaching pendant

- The device can hold tablets 8 to 11-inch for flexible mounting.
- Ergonomic **grip** design ideal for long and fatigue-free operation.
- Pivoting mechanism allows the tablet to be used **Vertically or horizontally** to display a variety of contents such as tables, graphs, and maps.
- **Dedicated accessories** including wall mount for installation in limited spaces when the device is not in use.

*) The above image shows the device mounted on a commercially available tablet.
*) The tablet must be purchased by the user.
Machine Tools Industry Solutions

**X Series**
Emergency Stop Switches

Unique technology for extreme safety

- **Reverse energy structure** and **Safe Break Action** minimize the possibility of failure in the event of an accident.
- E-stops can be reset by **turn reset** or **pull reset**, preventing failure caused by incorrect reset operation.
- Smooth surface and low profile prevents interference with other components on the operation panel.

<table>
<thead>
<tr>
<th>Series</th>
<th>Mounting Hole Size (mm)</th>
<th>Mushroom Size (mm)</th>
<th>Contact Ratings</th>
<th>International Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>XA (unibody)</td>
<td>ø16.2</td>
<td>ø29, ø40</td>
<td>Gold Plated Silver Contacts: 5A (30V DC / 125V AC / 250V AC)</td>
<td>☐ ☐ ☐ ☐ ☐ ☐</td>
</tr>
<tr>
<td>XA (removable contact block)</td>
<td>ø16.2</td>
<td>ø30, ø40</td>
<td>Gold Plated Silver Contacts: 5A (30V DC / 125V AC / 250V AC)</td>
<td>☐ ☐ ☐ ☐ ☐ ☐</td>
</tr>
<tr>
<td>X6</td>
<td>ø16.2</td>
<td></td>
<td>Gold Plated Silver Contacts: 5A (30V DC / 125V AC / 250V AC)</td>
<td>☐ ☐ ☐ ☐ ☐ ☐</td>
</tr>
<tr>
<td>XW</td>
<td>ø22.3</td>
<td>ø40, ø60</td>
<td>Gold Plated Silver Contacts: 5A (30V DC / 125V AC / 250V AC) (connector type: 2.5A)</td>
<td>☐ ☐ ☐ ☐ ☐</td>
</tr>
<tr>
<td>XW (indicator type)</td>
<td>ø22.3</td>
<td>ø38</td>
<td>Gold Plated Silver Contacts: 5A (30V DC / 125V AC / 250V AC)</td>
<td>☐ ☐ ☐ ☐ ☐</td>
</tr>
<tr>
<td>XN</td>
<td>ø30.5</td>
<td>ø40, ø60</td>
<td>Gold Plated Silver Contacts: 5A (30V DC / 125V AC / 250V AC)</td>
<td>☐ ☐ ☐ ☐ ☐</td>
</tr>
</tbody>
</table>

Application: Operation panels for machine tools and manual pulse generators

Abundant size variations and high reliability
LB/LBW Series
Flush Silhouette Switches ø18/22 Switches & Pilot Lights

Flush Silhouette switches ideal for operation panels

Stylish design with 2mm-thick bezel prevents particles and contaminants from accumulating.

With a short body and a removable contact block, space can be maintained behind the panel, making wiring easy.

### LB/LBW Series

<table>
<thead>
<tr>
<th>Series</th>
<th>Bezel Diameter</th>
<th>Mechanical Durability</th>
<th>Electrical Rating</th>
<th>Contact Rating</th>
<th>International Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>LB</td>
<td>ø22 / 22mm</td>
<td>Momentary: 2,000,000 operations min. Maintained: 250,000 operations min. Selector/key selector sw: 250,000 operations min.</td>
<td>50,000 or 100,000 operations min. (<em>1)(</em>)2</td>
<td>Momentary: 2,000,000 operations min. Maintained: 250,000 operations min. Selector/key selector sw: 250,000 operations min.</td>
<td>UL CSA TÜV CCC CE</td>
</tr>
<tr>
<td>LBW</td>
<td>ø26 / 26mm</td>
<td>Momentary: 2,000,000 operations min. Maintained: 250,000 operations min. Selector/key selector sw: 250,000 operations min.</td>
<td>50,000 or 100,000 operations min. (<em>1)(</em>)2</td>
<td>Rated Insulation Voltage: 250V Rated Operating Voltage: 5A (silver contact) 3A (gold contact)</td>
<td>UL CSA TÜV CCC CE</td>
</tr>
</tbody>
</table>

*1) Depends on rated operating current *2) Switching frequency - 1800 operations/hr. momentary 1200 operations/hr. maintained including selector switches and key selector switches

Application: Operation panels for machine tools

For easy-to-operate panels with low profile switches
Simple wiring with Push-in technology

- With a bezel height of only 2.5mm, low projection from the panel surface prevents dust and other particles from accumulating and makes regular cleaning and maintenance easy.
- Wiring is completed simply by inserting a solid wire or ferrule into the Push-in terminal. No need for retightening, increasing efficiency for mass production.

### Contact block depth reduced
- Saves space inside panel and enables downsizing of equipment

- **Pushbuttons**
  - Single contact block
  - Panel depth: 36.4mm
  - Double contact block
  - Panel depth: 59.6mm

### Time saving & efficient
- Reduces wiring time

- **Push the wire straight in as far as it will go.**
- **Connection is completed. Pull lightly to make sure it is firmly in place.**

<table>
<thead>
<tr>
<th>Series</th>
<th>Mounting Hole Size (mm)</th>
<th>Bezel Size (mm)</th>
<th>Terminal Style</th>
<th>IP Ratings</th>
<th>International Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>HW</td>
<td>ø22</td>
<td>ø30</td>
<td>Screw</td>
<td>IP65</td>
<td>UL</td>
</tr>
<tr>
<td>CW</td>
<td>ø22</td>
<td>ø30</td>
<td>Push-in</td>
<td>IP65</td>
<td>●</td>
</tr>
</tbody>
</table>

*Approx. 55% reduced*  
Based on IDEC research

**Application:** Operation panels for machine tools and equipment

Improve wiring efficiency with push-in technology
**CW Series USB/RJ45 Ports**

- **USB/RJ45 ports with flat stylish design**
  - Flush bezel projects only 2mm from the front of the panel.
  - Plastic encapsulated structure of the rear part prevents the cable from falling off (USB port only).
  - Rubber and transparent plastic covers available. Water- and dust-proof. IP65/IP67 degree of protection.

### Accessories

<table>
<thead>
<tr>
<th>Name / Shape</th>
<th>Material</th>
<th>Color</th>
<th>Part No.</th>
<th>Protection Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rubber cap</td>
<td>TPE</td>
<td>Black</td>
<td>CW9Z-D1X1</td>
<td>IP65/67</td>
</tr>
</tbody>
</table>

*)(*) Accessories can only be used for CW series ports (CW1X / CW4X).

### Series

<table>
<thead>
<tr>
<th>Series</th>
<th>Mounting Hole Size (mm)</th>
<th>Connector standard</th>
<th>No. of contacts</th>
<th>Protection degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB2.0</td>
<td>ø22</td>
<td>USB2.0 compliant</td>
<td>–</td>
<td>IP20 IP65/67 (accessory attached)</td>
</tr>
<tr>
<td>RJ45</td>
<td>ø22</td>
<td>–</td>
<td>8 pin</td>
<td>IP20 IP65/67 (accessory attached)</td>
</tr>
</tbody>
</table>

**Application:** Operation panels for machine tools and equipment

**Improve connectivity**
Broad range of high performance joysticks

- Similar in size and operation to "gamepad" controls, but in a rugged industrial package.
- Hall effect technology.
- SIL/PLd capable.
- EMC Shielded.
- Short behind the panels.

**TS/3000 Series**

Small Joysticks

<table>
<thead>
<tr>
<th>Series</th>
<th>Life Cycles</th>
<th>Axis</th>
<th>Technology</th>
<th>Output</th>
<th>Mounting Style</th>
<th>IP Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>TS</td>
<td>1 million</td>
<td>1 or 2</td>
<td>Hall effect</td>
<td>Single, dual, analog, PWM, USB</td>
<td>Front, rear &amp; bushing</td>
<td>IP67/IP69K</td>
</tr>
<tr>
<td>3000</td>
<td>10 million</td>
<td>3</td>
<td>Hall effect</td>
<td>Single, dual, analog, PWM</td>
<td>Front or rear</td>
<td>IP65</td>
</tr>
</tbody>
</table>

**Application:** Control panels, remote controls

Intuitive control
Metal switches with robust and air-tight structure

- **Robust, durable, and stylish** metal switches with smooth surface. Stainless steel structure prevents corrosion.
- **Piezo Series** piezoelectric switches have a flat actuation surface and an epoxy potted back end high durability is maintained even when subject to coolants.

<table>
<thead>
<tr>
<th>Series</th>
<th>Output</th>
<th>Mounting Hole Size (mm)</th>
<th>IP Rating</th>
<th>Life Expectancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>AV</td>
<td>Contact</td>
<td>Ø22 to Ø30</td>
<td>IP65/IP67/IP69K</td>
<td>1 million cycles</td>
</tr>
<tr>
<td>Piezo</td>
<td>Pulse</td>
<td>Ø16 to Ø30</td>
<td>IP68, IP69K</td>
<td>50 million cycles</td>
</tr>
</tbody>
</table>

Application: Operation panels for machine tools and machines

Excellent design and high durability
Metal switches with superior durability

- Endures 10 million cycles with a secure tactile feedback.
- Improves durability of operation panels.
- Multimec™ switches are IP67 rated and protected (except PCB) even if the sealing on the panel surface deteriorates and the oil penetrates inside.

<table>
<thead>
<tr>
<th>Series</th>
<th>Terminal Style</th>
<th>Maximum Rating</th>
<th>IP Rating</th>
<th>Life Expectancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multimec™ 5 series - 5E &amp; 5G</td>
<td>Through-hole Surface mount</td>
<td>50mA - 24V DC</td>
<td>IP67</td>
<td>10 million cycles</td>
</tr>
</tbody>
</table>

Application: Operation panels

Improved durability of operation panels
IP/IS Series
Pushbuttons

Compact pushbuttons for harsh environments

- **Short** depth behind the panel suitable for applications with limited space such as manual pulse generators.
- **Comfortable** operation ergonomic design, improving the operability of manual pulse generators.
- **High environmental protection (IP67)**, durable for usage in machine tool environments.

<table>
<thead>
<tr>
<th>Series</th>
<th>Bezel Material</th>
<th>Mounting Hole Size (mm)</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP</td>
<td>Zinc diecast</td>
<td>Ø13.6</td>
<td>IP Series</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(*1)</td>
</tr>
<tr>
<td>IS</td>
<td>Polyamide</td>
<td>Ø13.6</td>
<td>IS Series</td>
</tr>
</tbody>
</table>

*1) Dimension for IP series momentary (illuminated, round, solder terminal)
For other models, see website.

Application: Manual pulse generators, teaching pendants

Improved operability of hand-held boxes
Ensuring safety during remote operation

- **Ergonomic 3-position structure** stops machines safely either by pushing or releasing.
- Wide variety of models available.
- NBR/PVC models for applications requiring **oil resistance**.
- Polyblend rubber boots also available.

### HE Series

#### Ergonomic 3-position operation

<table>
<thead>
<tr>
<th>Series</th>
<th>Mounting Hole Size (mm)</th>
<th>Electrical Durability</th>
<th>Terminal Style</th>
<th>IP Rating</th>
<th>Rated Thermal Current</th>
<th>Rubber Boot Material</th>
<th>International Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>HE3B</td>
<td>Ø16</td>
<td>Position 1 ➞ 2 ➞ 1: 1 million operations min. Position 1 ➞ 2 ➞ 3 ➞ 1: 100,000 operations min. Operating frequency: 1200 operations per hour</td>
<td>Solder</td>
<td>IP40 IP65</td>
<td>3A (125V DC)</td>
<td>Silicon rubber, color: Y (yellow), B (black)</td>
<td>● ● ● ●</td>
</tr>
<tr>
<td>HE5B</td>
<td>Ø16</td>
<td>Position 1 ➞ 2 ➞ 1: 1 million operations min. Position 1 ➞ 2 ➞ 3 ➞ 1: 100,000 operations min. Operating frequency: 1200 operations per hour</td>
<td>Solder</td>
<td>IP65</td>
<td>3A (125V DC)</td>
<td>NBR/PVC Polyblend, color: gray</td>
<td>● ● ● ●</td>
</tr>
</tbody>
</table>

Application: Manual pulse generators, teaching pendants

Improved safety of hand-held boxes
HS1T
Interlock Switches with Solenoid

Excellent robustness to ensure operator safety

- Features strong locking force of $F_{zh} = 5000\text{N}$ to protect operators from danger.
- Head rotating structure enables the head to be rotated without removing the head.
- The 3-cam structure, which includes 2 stainless steel cams, achieves high durability against tensile force.

<table>
<thead>
<tr>
<th>Series</th>
<th>Type and Coded Level</th>
<th>Locking Force</th>
<th>Electrical Durability</th>
<th>Terminal Style</th>
<th>IP Rating</th>
<th>Rated Current</th>
<th>International Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS1T</td>
<td>Type 2 low level coded interlocking device (ISO 14119)</td>
<td>5000N</td>
<td>100,000 times min. (AC-15 0.75A/250V)</td>
<td>Spring clamp</td>
<td>IP67</td>
<td>200mA</td>
<td>UL</td>
</tr>
</tbody>
</table>

Application: Machine guards

Ensuring operator safety
Compact size with advanced safety

Compact size allows the interlock switch to be easily enclosed in guards as a preventive measure against invalidation, which is required by safety standard ISO14119 for interlock devices.

Head removal detection function detects contact signals even when the head comes off during locking to ensure safety.

Optional spring loaded actuator locks the door safely when the door bounces.

Head removal detection

<table>
<thead>
<tr>
<th>HS5L-VD44M-G (Lock monitor circuit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actuator unlocked</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Lock monitor circuit</td>
</tr>
<tr>
<td>Lock monitor circuit</td>
</tr>
<tr>
<td>OFF</td>
</tr>
<tr>
<td>OFF</td>
</tr>
</tbody>
</table>

Head removal detection function is not a direct opening action mechanism.

Spring loaded actuators

Saves-space inside panels and equipments

IDEC patented spring loaded actuator locks the door safely when the door bounces. When the actuator is fully inserted (door closed completely), the door can tolerate a space of up to 16mm.

Application: Machine guards

Ensuring operator safety
HS5D
Interlock Switches

Easy installation in tight spaces

- **Head removal detection function** detects removal of the head by signals to ensure safety.
- Available with **3-contacts** including a dual contact + monitor contact although the size is the same as 2-contact models.

<table>
<thead>
<tr>
<th>Series</th>
<th>Type and Coded Level</th>
<th>Electrical Durability</th>
<th>Terminal Style</th>
<th>IP Rating</th>
<th>International Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS5D</td>
<td>Type 2 low level coded interlocking device (ISO 14119)</td>
<td>100,000 operations minimum (AC-12 250V, 6A) 1,000,000 operations minimum (24V AC/DC 100 mA) (operation frequency: 900 operations per hour)</td>
<td>Screw</td>
<td>IP67</td>
<td>UL, CSA, TÜV, CCC, CE</td>
</tr>
</tbody>
</table>

Application: Machine guards

Ensuring operator safety

Small size with 3 contacts

- 3 contact types with dual enabling contacts and a monitor contact are available. Compact size allows installation in tight spaces (30×91×30mm)

Head removal detection function

When using HS5D-12

<table>
<thead>
<tr>
<th>Main circuit (NC)</th>
<th>Actuator unlocked</th>
<th>Actuator locked</th>
<th>Head removed</th>
</tr>
</thead>
<tbody>
<tr>
<td>ε 11, 12</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>ε 21, 22</td>
<td>OFF</td>
<td>ON</td>
<td>ON</td>
</tr>
</tbody>
</table>

Note: Head removal detection function is not a direct opening action mechanism.
SE2L Safety Laser Scanner

Compact safety laser scanner for easy integration in machine tools

- Compact size suitable for integration in devices (85 x 85 x 95mm).
- Safety can be maintained throughout a range of 270 degrees at a distance of 5m with a single unit.
- A combination of up to 4 master/slaves can be connected. This makes it possible to integrate input and output of multiple units for 360-degree detection, as though they are a single unit.
- SE2L can monitor two separate hazardous areas to stop machines when detecting the access of humans.
- SE9Z-* connection box that reduces maintenance time and wiring. (*1)

*1 Coming Soon

Series | Performance Level | SIL | Response Speed | Power Supply Voltage | Power Consumption | International Standards
--- | --- | --- | --- | --- | --- | ---
SE2L | PL=d | SIL 2 | ON → OFF: 60 to 510ms
OFF → ON: 270 to 510ms | 24V DC ± 10%: When using converter power supply
24V DC -30%+20%: When using battery | Without Output Load: 6W
Maximum (without output load): 50W
UL | CSA | TÜV | CE

Distance 5m, sensing angle 270° (*1)

Master slave function
A maximum of four SE2Ls can be interconnected using RS-485 for master/slave operation.

SAME sensor can be used for area protection and access protection
Dual protection function reduces maintenance and cost.

SE9Z-* connection box

Compact size suitable for limited installation spaces

Application: Laser machines, bending machines, welding machines
HE2G Safety Grip Switches

Easy-to-grip ergonomic design

- **Compact design** enables a firm hold. Suitable for hold-to-run operations such as jog operation for filling machines.
- **Ergonomic 3-position structure** stops machines safely by pushing in or releasing.
- **Lightweight** structure suitable for long operation.

Select from a wide variety of models

Equipped with different control units for various uses.

<table>
<thead>
<tr>
<th>Series</th>
<th>Rubber Boot Material</th>
<th>IP Rating</th>
<th>International Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>HE2G</td>
<td>Silicon rubber: Y (yellow), B (black)</td>
<td>IP67</td>
<td>● ● ● ● ● ● ● ● ● ● ●</td>
</tr>
<tr>
<td></td>
<td>NBR / PVC polyblend rubber boot color: gray</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Application: Operation panels

Ensuring operator safety
**LED Lightings**

**LD6A**

**LED SignaLight Towers**

**Compact size saves machine space**

- Universal design with oval shape and striped design enhances **visibility**.
- Variety of mounting patterns, easily replaceable LED units, and **plug-in** terminals. Color combinations can be changed on-site, **reducing** maintenance time.
- Steady / flashing (flashing cycle compliant with **IEC** standards / alarm types available).
- Unique powerful design with 360-degree sound field. Two **alarm** sound patterns available.

**Characteristics of the lenses and light**

Three different illumination methods and a unique lens shape enable high visibility from all directions.

By combining a diffusing lens, which diffuses the light broadly, with a condensing lens, a super bright area is created enabling high visibility. Also, the illumination through the light guide enhances the visibility when the SignaLight is viewed from below.

<table>
<thead>
<tr>
<th>Series</th>
<th>Rated Voltage</th>
<th>Power Consumption (LED)</th>
<th>Power Consumption (Buzzer)</th>
<th>Flashing Cycle (IEC60073)</th>
<th>LED Life</th>
<th>Alarm Volume</th>
<th>International Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD6A</td>
<td>24V AC/DC</td>
<td>LED: 0.6W (R, Y) 0.75W (S, G) 0.5W (W)</td>
<td>110mA max.</td>
<td>Approx. 105 flashes per minute (1.75Hz)</td>
<td>Approx. 30,000 hours</td>
<td>70 to 90dB, at 1m (volume adjustable)</td>
<td>UL</td>
</tr>
</tbody>
</table>

**Application:** Machine status indication

**Detests machine failure**
**LF1B-N/LF2B**

LED Lighting

Wide range of variations including compact size for flexible installation

- LF1B-N has a rated voltage of 24V DC, 6 lengths, and 6 color variations. RGB types can be used as an indicator lamp.
- LF2B available with 100 to 240V AC and 24V DC voltages ideal for export to global destinations.

<table>
<thead>
<tr>
<th>Series</th>
<th>Lens</th>
<th>IP Rating</th>
<th>Rated Voltage</th>
<th>International Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>UL</td>
<td>CSA</td>
</tr>
<tr>
<td>LF1B-N</td>
<td>Diffusing / condensing</td>
<td>IP65</td>
<td>24V DC</td>
<td>●</td>
</tr>
<tr>
<td>LF2B</td>
<td>Diffusing / condensing</td>
<td>IP65</td>
<td>24V DC (100 to 240V AC)</td>
<td>(●)</td>
</tr>
</tbody>
</table>

*1) 12/24V DC type only

Two easy mounting styles

- Quick and easy installation
  Dedicated brackets (2 types) available for mounting

Direct mounting with L-shaped mounting brackets

Direct mounting with U-shaped mounting brackets

**Application:** Lighting inside machine tool panels

Small and easy-to-use inside panel
RU/RJ/RV8
Slim Relays / Universal Relays

Slim, compact relays save installation space

- **Compact size** with excellent durability and high allowable contact current.
- **Circuit check** can be performed without energizing the coil, so operation can be checked **before applying power** to the relay. (RU)
- **The release lever** easily holds and removes the relay and push-in terminals reducing **wiring time**. (RU, RJ)
- **Space-saving 6mm ideal for high density mounting.** (RV8)

### Time Saving & Efficient

**Save up to 55% in wiring time**

Wiring time greatly reduced compared with conventional screw terminals.

- **Push-in SJ Series**
  - Approx 55% reduced
- **Conventional screw terminal**
  - *Based on IDEC research

**Reduce maintenance work**

Push-in terminals eliminate the need for torque maintenance such as tightening of screws because screws are not used.

**Safe & Easy**

- **Equipped with a release lever**
  - The release lever easily holds and removes the relay.

### Application: Construction of control circuits

Compact size with high-capacity contacts, reducing installation space

<table>
<thead>
<tr>
<th>Series</th>
<th>Allowable Contact Current</th>
<th>Contact Material</th>
<th>Electrical Life</th>
<th>Mechanical Life</th>
<th>International Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>RU</td>
<td>1-pole: 12A</td>
<td>AgNi (*1)</td>
<td>• AC: 200,000 operations min.</td>
<td>• AC: 30,000,000 operations min.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-pole: 8A</td>
<td>AgNi (Au clad) (*2)</td>
<td>Operation frequency 1800 operations/h (*1)</td>
<td>DC: 50,000,000 operations min.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-pole (bifurcated contacts): 3A</td>
<td></td>
<td>• AC: 100,000 operations min.</td>
<td>Operation frequency 18,000 operations/h (*2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-pole (bifurcated contacts): 2A</td>
<td></td>
<td>DC: 200,000 operations min.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-pole (bifurcated contacts): 1A</td>
<td></td>
<td>Operation frequency 1800 operations/h (*3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RV</td>
<td>2-pole (RU2): 10A</td>
<td>Ag alloy</td>
<td>• AC: 50,000,000 operations min.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-pole (RU4): 6A</td>
<td>Ag (Au clad)</td>
<td>DC: 10,000,000 operations min.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-pole (RU42 bifurcated contacts): 3A</td>
<td></td>
<td>2-pole (RU2): Operation frequency 1800 operations/h (*4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-pole (RU42 bifurcated contacts): 2A</td>
<td></td>
<td>50,000,000 operations min.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-pole (RU42 bifurcated contacts): 1A</td>
<td></td>
<td>100,000 operations min. (250V AC, 3A/resistive load)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RV8</td>
<td>6A</td>
<td>AgNi +Au plated</td>
<td>30,000 operations min. (NO contact)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10,000 operations min. (NC contact) (*)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10,000,000 operations min. (Operation frequency 18,000 operations/h)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1) 1-pole; 2-pole *2) 2-pole (bifurcated contacts) *3) 250V / DC30Y AC, 6A resistive load, operation frequency 1800 operations/h) *4) RV8 only
RF2
Forced Guided Relays

2-pole forced guided relays reduce cost and installation space

- **2-pole** relays achieve easy configuration of a safety circuit without having an excessive number of poles.
- Mechanical indicator allows easy confirmation of the contact status.
- By using the relays with **Push-in terminal**, screw terminal, or PC board sockets, the relay can be easily replaced during maintenance.

<table>
<thead>
<tr>
<th>Series</th>
<th>Socket</th>
<th>Allowable Switching Current</th>
<th>Electrical Life</th>
<th>Mechanical Life</th>
<th>International Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF2</td>
<td>PC board terminal, Screw terminal, Finger protect screw terminal, Push-in terminal</td>
<td>6A</td>
<td>NO contact: 100,000 operations minimum (operating frequency 1,800 per hour) at 240V AC / 6A resistive load or 2A inductive load (power factor 0.4) 100,000 operations minimum (operating frequency 1,800 per hour) at 24V DC / 6A resistive load or 1A inductive load (time constant 48ms) NC contact: 100,000 operations minimum (operating frequency 1,800 per hour) at 240V AC / 3A resistive load or 2A inductive load (power factor 0.4) 100,000 operations minimum (operating frequency 1,800 per hour) at 24V DC / 3A resistive load or 1A inductive load (time constant 48ms)</td>
<td>10 million operations min. (operating frequency 18,000 per hour)</td>
<td></td>
</tr>
</tbody>
</table>

**Application:** Safety circuits

Improving maintainability
**HG Series**

Operator Interfaces

**Touch panel with excellent oil resistance and robustness**

- **IP66F** rated operator interface for use in machine tool environments where oil is used.
- **Hard coat** protected for excellent durability and preventing scratches during operation even with metal cutting chips remaining on the hands.

### HG Series Operator Interfaces

<table>
<thead>
<tr>
<th>Series</th>
<th>Display Size</th>
<th>Touch Switch</th>
<th>Communication / Memory Interface</th>
<th>Video / Audio Interface</th>
<th>Rated Voltage</th>
<th>International Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>HG1G</td>
<td>4.3 inch</td>
<td>Analog resistive</td>
<td>COM, LAN, USB1, USB2</td>
<td></td>
<td>12 / 24V DC</td>
<td>● ● ●</td>
</tr>
<tr>
<td>HG2G-V</td>
<td>5.7 inch</td>
<td>Analog resistive</td>
<td>COM1, COM2, LAN, USB1, USB2</td>
<td></td>
<td>12 / 24V DC</td>
<td>● ● ●</td>
</tr>
<tr>
<td>HG2G-5T</td>
<td>5.7 inch</td>
<td>Analog resistive</td>
<td>SERIAL, LAN, USB, USB2</td>
<td></td>
<td>24V DC</td>
<td>● ● ●</td>
</tr>
<tr>
<td>HG3G-V</td>
<td>10.4 / 8.4 inch</td>
<td>Analog resistive</td>
<td>COM1, COM2, LAN, USB1, USB2, SD, EXT</td>
<td>VIDEO IN1, VIDEO IN2, AUDIO OUT</td>
<td>24V DC</td>
<td>● ● ●</td>
</tr>
<tr>
<td>HG4G-V</td>
<td>12.1 inch</td>
<td>Analog resistive</td>
<td>COM1, COM2, LAN, USB1, USB2, SD, EXT</td>
<td>VIDEO IN1, VIDEO IN2, AUDIO OUT</td>
<td>24V DC</td>
<td>● ● ●</td>
</tr>
<tr>
<td>HG5G-V</td>
<td>15 inch</td>
<td>Analog resistive</td>
<td>COM1, COM2, LAN, USB1, USB2, SD, EXT</td>
<td>VIDEO IN1, VIDEO IN2, AUDIO OUT</td>
<td>24V DC</td>
<td>● ● ●</td>
</tr>
</tbody>
</table>

**Application: Operation interfaces**

**Touch panels suitable for machine tool environments**
Unmanaged Ethernet switches equipped with various features

- **High impulse resistance** enables high reliability and stable operation.
- **Robust metal housing** for superior environmental resistance
- **Compliant with Fast Ethernet standards** for high-speed communication
- **Equipped with various functions** such as QoS (8-port model only) and redundant power input (*1)

*1 Available soon

### SX5E Ethernet Switches

Series: SX5E | Rated Input Voltage: 12/24/48V DC, 240V AC | Voltage Tolerance: 9-60V DC, 18-30V AC | Power Consumption: 3.4W | Ethernet Standard: IEEE802.3u (100BASE-TX)/IEEE802.3i (10BASE-T) compliant | Data Transfer Speed: 10Mbps/100Mbps (Auto-negotiation function) | Communication Method: All ports full/half duplex (Auto-negotiation function) | Number of Ports: 5

Dimensions in mm:

**SX5E-HU055B**: Width 29.6, Height 48.3, Depth 25.0

**SX5E-HU085B**: Width 45.6, Height 68.0, Depth 29.6

Application: Control panels for machine tools and equipment

Improve connectivity
<table>
<thead>
<tr>
<th>Country</th>
<th>Company Name</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>IDEC Corporation</td>
<td>Tel: +1-408-747-0550 <a href="mailto:opencontact@idec.com">opencontact@idec.com</a></td>
</tr>
<tr>
<td>Germany</td>
<td>APEM GmbH</td>
<td>Tel: +49-40-25 30 54-0 <a href="mailto:service@eu.idec.com">service@eu.idec.com</a></td>
</tr>
<tr>
<td>Singapore</td>
<td>IDEC Izumi Asia Pte. Ltd.</td>
<td>Tel: +65-6746-1155 <a href="mailto:info@sg.idec.com">info@sg.idec.com</a></td>
</tr>
<tr>
<td>Thailand</td>
<td>IDEC Asia (Thailand) Co., Ltd.</td>
<td>Tel: +66-2-392-9765 <a href="mailto:sales@th.idec.com">sales@th.idec.com</a></td>
</tr>
<tr>
<td>India</td>
<td>IDEC Controls India Private Limited</td>
<td>Tel: +91-80679-35328 <a href="mailto:info_india@idec.com">info_india@idec.com</a></td>
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<td>Taiwan</td>
<td>IDEC Taiwan Corporation</td>
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<td>Tel: +86-21-6135-1515 <a href="mailto:idec@cn.idec.com">idec@cn.idec.com</a></td>
</tr>
<tr>
<td>Japan</td>
<td>IDEC Corporation</td>
<td>Tel: +81-6-6398-2527 <a href="mailto:jp_marketing@idec.com">jp_marketing@idec.com</a></td>
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</tbody>
</table>

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