TE connectivity

TE SENSORS EVERYWHERE

- TEMPERATURE
- VIBRATION/ FORCE/TORQUE
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The NEXT LEVEL of AUTOMATION

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RS

The Future of Industrial Automation

How is technology transforming its processes?

The first industrial revolution in factories changed the world in the late 1700s. Then came the second during the early 20th century with the combustion engine, and the third after World War II with the development of transistors and microprocessors. Now in the 21st century, we're experiencing the fourth industrial revolution; known as Industry 4.0.

Today's revolution is the digitisation of the manufacturing industry, powered by advancements such as the Industrial Internet of Things (IIoT), robotics, augmented reality, and artificial intelligence.

These next-generation technologies help to improve productivity and safety, reduce downtime and increase energy efficiency. Read on to learn how some of these tools work when applied to industrial environments, and how they can benefit businesses now and in the future.

The Industrial Internet of Things

IIoT is formed by connected devices, sensors and computers which collect and analyse data in manufacturing environments; helping to reduce waste and inefficiencies. Machine-to-machine communication (M2M) and sensors create an environment where IIoT can prosper.

Businesses are already using IIoT and automation to monitor internal environments of production facilities and minimise energy use to lower manufacturing costs. By using devices like smart helmets to communicate with manufacturing equipment, safety and working conditions can also be improved.

Industry 4.0 is the heart of smart manufacturing, allowing large amounts of data to be stored and processed in the cloud. This means whether they're on or off-site, manufacturers will be able to monitor, maintain and adjust equipment with complete accuracy without stopping production.

This is assisted by open source devices and software, which enable greater control and flexibility over processes through the use of computer programming.

This is because the software has source code that anyone can inspect, modify, and enhance – the code computer programmers can manipulate to change how a program or application works.

IIoT is changing the industrial landscape in many ways, and its impact will only continue to increase.
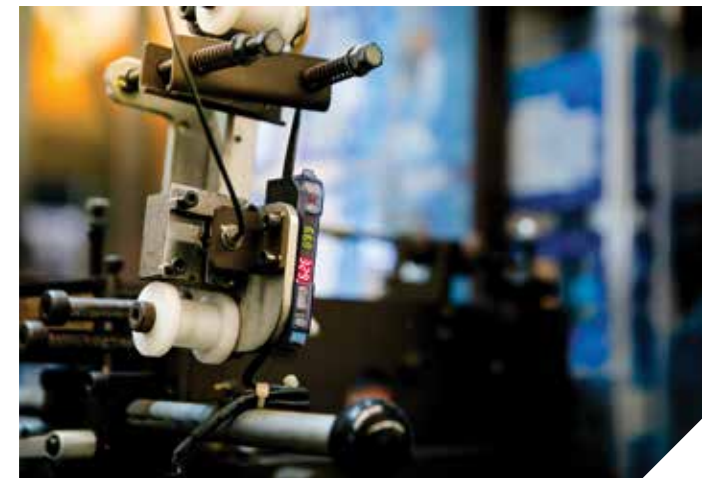
Robotics is on the rise

Robots are becoming an increasingly popular way of completing dangerous or repetitive tasks without human involvement. Not surprisingly, the International Federation of Robotics (IFR) predicts that more than 1.7 million new industrial robots will be installed in factories worldwide by 2020.

IIoT enables robotic hardware to be smarter, faster, and more aware. Combined with sensors, a mobile robot could, for example, identify when a worker is in the area and slow or stop production to allow for input. This type of robot, known as cobot, collaborates with humans and one another to work more intelligently.

There's an expansive range of robots available – from basic arms to autonomous vehicle-mounted machines. They're becoming more common in some of the world's major manufacturing industries, including food and beverage, pharmaceuticals, aerospace and construction.

Automation with robotics enables a level of accuracy and productivity beyond human ability. Plus the new generation of robotics is not only much easier to program, but easier to use, with capabilities like voice and image recognition.

Augmented reality in real life

With Industry 4.0 and intelligent manufacturing, more consideration is being given to the value of augmented reality (AR) for industrial applications. New tools are enabling companies to create and test scenarios in the virtual world – simulating the design process and assembly line prior to a product being created.

AR has the potential to recharge the manufacturing industry by connecting workers with equipment and allowing them to interact with sensor data. The technology aims to produce efficient operations by reducing production downtime, quickly identifying problems and keeping processes running.

This can be achieved through AR glasses which overlay virtual reality onto the real world. With this, engineers can see renderings of bolts, cables, part numbers and instructions on how to assemble a specific component.

It's also possible to use AR-enabled mobile apps to scan QR codes to view live video, graphics, images, or use it to repair machines.

Many manufacturers have begun to explore the benefits augmented reality can offer in an industrial environment, a trend that has nowhere to go but up as AR hardware and software improves.

Artificial intelligence and machine learning

Artificial intelligence (AI) systems show information relating to a machine's condition and productivity, as well as detect irregularities and make it possible to learn from experience and perform human-like tasks. Meanwhile, machine learning is a subfield of AI which uses statistical techniques to give computers the ability to 'learn' with data.

Machine learning is much faster than humans, as it can analyse immense amounts of data in real-time and turn it into actionable improvements; helping speed production and lower costs by avoiding errors.

With AI and machine learning, manufacturers can use more of their production capacity and optimise the best possible combination of machines, staff, and suppliers.

The technology can also be used in cobots, allowing for a robot to not only safely work alongside humans, but also be easily reprogrammed for new tasks – unlike traditional industrial robots which rely on extensive programming for each action.

One of the greatest benefits is increased uptime and productivity from predictive maintenance. With AI integrated with industrial robotics technology, machines can monitor their own accuracy and performance and signal when maintenance is needed to avoid expensive downtime.

The use of AI and machine learning can enhance performance across all areas of a supply chain including warehousing, transportation, customer feedback, production, and packaging.

What the future holds

With half of the manufacturers in the region expected to have smart factories by 2022, it's evident the landscape of industrial automation is changing.

Read on to find out more about how you can take your automation to the next level with our wide range of products and design tools.

'Black-box' solutions fall by the wayside as connectivity and data drive next-generation smart machines and factories

Heiko Luckhaupt from RS Components looks into how companies can evolve their architectures in order to address the needs of more data-driven customers. Even those that already exist on a digital platform can take greater strides to integrate data collection and flow into wider operations.

The advent of the Industrial Internet of Things (IIoT) and Industry 4.0 have seen many companies jumping onto the digital train, as more and more vertical sectors embrace the advantages to be had from a data-driven infrastructure.

OEMs are pushing greater connectivity and data capability, or the end users are demanding it. In either case, connectivity across the entire value and supply chain is what is underpinning this fourth industrial revolution.

With access to more data, plant owners, line supervisors and machine operators have a greater insights in their operations, which ultimately gives them the ability to make more informed real-time decisions to fine-tune their production processes. This data can then be historically analysed to spot trends and, in the shorter term, shared to the wider enterprise to help with forecasting, maintenance and logistics. The ultimate aim is far greater agility, more flexibility to adapt machines to changing market demands and enhanced proactivity for other operations.

One company that recognised the potential of a data-capable architecture – and not just an architecture that covered its specific domain – was Shanghai SIASUN Robot and Automation Co., Ltd. As a supplier of industrial robots for a variety of tasks, including spot welding, arc welding, handling, assembling, gluing,

spraying and casting, to name but a few, it set itself a mission to not only deliver this greater connectivity, but also improve the efficiency and agility of its robotic solutions.

Set up in 2000, the company has grown to become one of the largest robot makers in China. With its own independent research and development department, it builds robots that are designed to address the needs of many industrial applications across a variety of segments, from food, through packaging and on to automotive and trucks.

Underpinning this desire for flexibility and connectivity is the deployment of advanced automation and motion solutions that not only provide the accuracy and repeatability demanded by robotic applications, but also deliver the all-important connectivity to wider systems, both inside and outside of the production environment. The days of black-box controllers for applications are long gone. Customers are now demanding open, expandable systems, based on off-the-shelf hardware running on networks that deliver

plug-and-play capabilities, not just line side, but also into the wider enterprise.

Siasun opted for the PacDrive 3 motion control platform from Schneider Electric. PacDrive 3 is a complete automation solution for motion-centric machines and is based upon proven logic motion technology, which unifies PLC, motion and robotics control functionality on a single hardware platform. Thanks to its centralised architecture, it is capable of controlling a wide range of multi axis servo-driven solutions. In addition to robotics, it is also seeing applications in packaging and materials handling, where precision and repeatability are just as important.

Each robot has three or four Lexium 52 servo amplifiers and motors operating alongside the PacDrive 3 solution, communicating over Sercos and OPC UA and with programming undertaken in Schneider Electric's EcoStruxure Machine Expert programme, Siasun completed full programming in an incredibly short timescale. The open technology deployed by PacDrive 3 leverages international standards, which, as a result reduces complexity, greatly aiding design, testing, installation, commissioning, start up, operation and maintenance.

Using PacDrive 3, Siasun has enhanced the performance of its parallel robot – with efficiency improvements of up to 30%. Not only does this provide a stronger sales message for Siasun, but it ultimately delivers greater saving to the end customer too.

Already successfully deployed in electronics manufacture, pharmaceutical production lines and food packaging, Siasun is now looking to implement more of Schneider Electric's smart manufacturing solutions, to further boost its competitiveness and its drive to grow export opportunities.

EcoStruxure is Schneider Electric's single, open, IoT-enabled, plug-and-play architecture that has been designed to deliver innovation and information across multiple industrial domains, including power, IT, building, machine, plant and grid. The ultimate aim of this broad connectivity is the delivery of enhanced value around safety, reliability, operational efficiency and sustainability. Indeed, EcoStruxure Machine-based applications have demonstrated 40% faster machine integration, 50% maintenance time savings, 30% reductions in time to market and improved use of resources.

EcoStruxure Machine delivers key technologies for product connectivity and edge control, using cloud technologies to provide analytics and digital services, and the PacDrive 3 solution is one part of a much larger offering. With Modicon PLCs and PACs offering the central data connectivity, a wide range of complementary products are available, all of which can add data into the IIoT mix to enhance the aforementioned decision making process. These include Schneider Electric's Magelis STO compact HMIs; Altivar low-voltage AC machine drives; Lexium servo drives &

motors; and TeSys motor circuit breakers, contactors and reversing contactors & enclosed motor starters.

RS Components is committed to providing its customers with the means to help them take the first steps into smart manufacturing. Although the concept can appear daunting, the plug-and-play nature of hardware and wizard-based programming makes this evolution a lot simpler than it appears. All of the Schneider Electric products are available from RS, as are many others. And with open standards driving industry, it really is remarkably easy to create next-generation solutions that not only address today's data-hungry economy, but also provide a foundation for future iterations – which are all going to be centred around connectivity and seamless interconnected data paths.

What's on the
Product Launchpad?

We're constantly launching new products and brands so you can complete your mission with the latest technologies.

Have a look at the newest products and brands we think will take off in Industrial Automation.

NEW

FLIR DM285 Handheld Thermal Imaging Multimeter

NEW

- A built-in 160 x120-resolution thermal camera sensor visually guides you to an electrical problem
- Performs 18 measurement functions including True RMS, VFD mode, LoZ, NCV, and more
- Drop-tested, splash and water resistant

FLIR

168-1355 10A ac 1000V ac 10A dc 1000V dc   DM285

FLIR DM91 Handheld Digital Multimeter

NEW

- Rich feature set: Includes True RMS, VFD mode, uA measurement, LoZ, NCV, and more
- Thermocouple input + test probe: The DM90 includes high-quality test probes and a Type K thermocouple input
- Durable: Drop-tested

FLIR

168-1353 10A ac 1000V ac 10A dc 1000V dc   DM91

FLIR DM62/DM64/DM66 Handheld Digital Multimeters

NEW

- All the features you need in one tool
- Rich feature set ideal for various electrical applications
- Fast Efficient Testing and Troubleshooting
- Operate the meter with one hand, thanks to compact design and easy-to-access buttons

FLIR

168-1345	TRMS Digital Multimeter with non-Contact Voltage	DM62
168-1347	HVAC TRMS Digital Multimeter with Temperature	DM64
168-1349	Electrical and Field Service TRMS Multimeter with VFD mode	DM66

Weller WD 1000 Soldering Station

NEW

- Ideal for use under magnification
- Fast heat-up, thermal stability, and fine tips make it perfect for production or rework, in standard or lead-free applications
- Heating element is built into the soldering tip for super-fast heat-up and recovery

Weller

162-4459 120V, +50°C to +450°C   WD1000MAU

RSAC Inverter Drives with EMC Filter

NEW

- Rugged diecast aluminium enclosure Hinged cover
- Diagnostic LED status indicators
- Easy install, simple operation (No programming required)
- GFCI/RCD compatible

RS PRO

136-3107	0.75 kW
136-3109	1.5 kW
136-3110	2.25 kW

3-Way RKT Series M12 Connectors

NEW

- Feature an industry standard 3, 4 or 5 pole female connector, with threaded lock nut and straight configuration
- Connector IP67 rated when mated
- O ring material FKM
- Knurled Nut CuZn nickel plated
- Contact material CuZn pre-nickeled 0.3 Micron gold plated

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161-5833	PVC Right Angled Female Connector	RKWT 4-3-06/2 M
161-5835	PUR Straight Female Connector	RKT 4-3-224/2 M

Compact Magnetic Box Inclinometer

NEW

- Digital electronic spirit level in practical format – with Bluetooth interface for measurement data transfer
- Reference function for transferring angles
- FlipDisplay :the display automatically turns when overhead measurements are involved so the illuminated display is well readable under all conditions

Laserliner Innovation in Tools

163-5164 User Calibrated, 59 × 59 × 28mm   081.262A

Humidity and Temperature Data Logger

NEW

- The readings are saved in the logger and simply read out by your PC with USB interface
- Memory for 16000 (171) readings
- Temperature datalogger (170)
- 2000 Counts digital LCD display (171E)

RS PRO

146-9094 Battery Powered, Digital, LCD Display

Modular Oscilloscope Probe

NEW

- Attenuation: 10:1
- Bandwidth: 150MHz
- Rise Time: 2,3 ns
- Cable Length: 1, 2m

RS PRO

146-6613 Probe Type: Passive 150MHz 600V

4-Way RKT Series M12 Connectors

NEW

- Feature an industry standard 3, 4 or 5 pole female connector, with threaded lock nut and straight configuration
- Connector IP67 rated when mated
- O ring material FKM
- Knurled Nut CuZn nickel plated
- Contact material CuZn pre-nickeled 0.3 Micron gold plated

lumberg automation

161-5834	PUR Straight Male Connector	RST 4-225/2 M
161-5836	PVC Straight Female Connector	RKMV 4-07/2 M

Retro-reflective Photoelectric Sensor

NEW

- 10Vdc to 30 Vdc supply voltage
- Single turn sensitivity potentiometer on retro and diffuse models (finger or screwdriver adjustable)
- Solid-state complementary (SPDT): NPN or PNP (current sinking or sourcing), depending on model

BANNER

847-9404 Max. 6.5 m Detection Range, PNP IP67   QS18VP6LVQ8
Barrel Style

LAN Test Equipment of Distance to Fault

NEW

- The Tester can check UTP and STP Cat 5E, 6, 6A and Coaxial Cable
- It can Identify Tester you can determaine the Continuity and Wiring of the Cable Pattern
- Comes with the Low Battery Indicator
- It uses TDR (Time Domain Reflectometer) to measure the length and distance of the cable

RS PRO

136-8577 Distance to Fault

Moisture Meter

NEW

- Used to measure the moisture level in sawn timber (also cardboard, paper) and hardened materials (plaster, concrete and mortar)
- It displays the moisture level in the material straight away

RS PRO

146-9081 Max. Measurement 0.2 → 2 (Building Material) %, 6 → 44 (Wood) %

Light Meter

NEW

- 3999 Counts Large Backlit LCD Display
- Low Battery Indication
- Sampling Rate: 2.5 times per second
- Spectral Response close to CIE luminous spectral efficiency
- Cosine Angular Corrected
- Confirms to JIS C1609: 1993 and CNS 5519 General A class specifications

RS PRO

146-9083 400000lx

Siemens LOGO! 8.2 Logic Module

NEW

- Integrated Web Server Refined screen giving a new look and feel to the Logic Module
- 6 line display with 16 characters per line meaning more specific messages can be used via text
- Optical emphasis of alarms catered for thanks to the selectable white, orange & red backlighting

SIEMENS

165-3222 24 V dc, 8 × Input, 4 × Output   6ED1052-1CC08-0BA0

CO2 & RH/T Sensor Kit

NEW

- NDIR CO2 sensor technology
- Integrated temperature and humidity sensor
- Best performance-to-price ratio
- Dual-channel detection for superior stability

SENSIRION THE SENSOR COMPANY

172-0554 Carbon Dioxide Sensor   SEK-SCD30

Continuous or Intermittent Illuminated Buzzers 24v ac/dc

NEW

- Bezel material plastic Mounting diameter 22mm
- Standard head type
- Continuous or intermittent tone

Schneider Electric

167-9011	Red lens	XB5KS2B4
167-9014	Yellow lens	XB5KS2B8
167-9008	Black cap	XB5KSB

4300 Series Axial Fans

NEW

- Speed signal
- Go / NoGo alarm
- Alarm with speed limit
- External temperature sensor
- Internal temperature sensor

ebm papst

168-2638	150m³/h, 5W, 12 V dc	4312N/17MT
168-2640	285m³/h, 12W, 12 V dc	4312NH3

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RS Pro PVC Black Edging strip, 20m x 9.5mm x 6.5mm

- Flexible and durable PVC ensure easy installation and is easy to fit the desired shape Edging Strips can be cut to measure with a knife or cable cutters.
- No speciality tools are required
- Self-gripping shape guarantees stable and secure position on the edge of the object
- Embedded steel core ensure extra durability and increased performance

619-1506   Sealing strip,PVC,wire insert,1-2,9×6.

PVC Sealing Strip

- Black PVC with steel wire insert.Provides edge protection to sheet material and reduces noise and wear resulting from vibration
- Temperature range -40°C to +90°C

619-1534   Sealing strip,PVC,insert,1-4,17×10.5.

RS Pro C13/14 Mains Lead

- Suitable for appliances with protection class I according To IEC 61140
- Female C13 to Male C14 plugs
- Rated at 250 V ac, 10 A maximum
- Kite mark licence No. 6745

487-277   Power Cord C13 to C14 2m

Auto Return Air Hose

- Heavy duty steel construction
- Both ratchet and free run operating
- Spring protector
- Movable stopper to adjust remaining hose length
- Brass coupling with 360° rotation
- Temperature range -5°C to +60°C

788-3736   Auto-Return Air Hose, 15m x 8mm

RS Pro 26 Piece Combination Spanner Set

- Manufactured from high-quality, chrome-vanadium steel
- Hardened and tempered
- General purpose, twin ended spanner set
- Supplied in handy storage case

388-3690   26 piece metric combination wrench set

Standard Weight Oil Only Pad

- Hydrophobic - float on water
- Designed for hydraulic engineers
- Open back for quick wicking
- Absorbency 0.9 litres per sheet
- Size 48 × 38 cm

771-6377   Standard weight oil only pad

C19 to C20 Power Cable Extension Lead

- European harmonised mains cable H05VV-F, 1.5mm²
- 3 way socket straight female connector type C19 to EN60320
- Fully Moulded Connectors with integral strain relief

321-219   Power Cord C19 to C20 2m

Light Duty Foot Switch

- Two metal cased foot switches with SPDT contacts
- Latching and non-latching versions
- Rated 250Vac/30Vdc at 3 A
- Incorporates non-slip base pad and footpad
- With 2m cable
- Sealed to IP40 or IP67

316-901   SPDT non-latching light duty foot switch

Silicone Grease

- Silicone grease is a water repellent, non-melting silicone grease lubricant
- Commonly used to lubricate plastic and polythene water pipes, rubber washers and other fluid pipework during assembly
- Working temperature range is between -50°C to 200°C
- This item is non-toxic
- Acting as waterproof or air tight seal

494-124   RS Silicone Grease, 100g Tube

RS Pro PTFE Thread Seal Tape

- Chemically inert material meaning it does not react with other elements
- Suitable for aggressive environments where acids, gases and solvents are present
- Non-adhesive
- Prevents fluid/pressure loss when used correctly
- Does not harden
- Easy to wind

512-238   PTFE thread seal tape,12m L x 12mm W

RS Pro 88 Piece VDE Electricians Tool Kit

- Ergonomic multi-component handles
- Optimum balance of torque and control
- High quality tools
- VDE approved for electrical safety
- Made from chrome vanadium steel
- Sturdy tool case

734-8885   88pc ½in. Socket & VDE Tool Kit

RS Pro Roller Tool Cabinets

- Full extension drawers for easy access to tools and parts
- Heavy duty oil proof wheels. 2 fixed, 2 swivel for easy steering
- Smart Lock on every draw keeps drawers closed avoiding accidental opening

833-5900   7 Drawer GT Plus

Lockout Starter Kit

- Portable electrical department lockout tagout kit
- Provides all the basic Lockout for valves and electrical panels
- Comprises of around 24 different products
- Supplied in a tough LOTO carring bag (with handle and shoulder carrier)

862-5247   Lockout Starter Kit

RS Cat6a F/FTP cable

- 4 pair multi-construction
- Bare copper conductor
- Skin-Foam-Skin Insulation
- LSZH Jacket

842-7349   LSZH Cat6a F/FTP cable 500m

RJ11/RJ45 Couplers Unshielded/Shielded

- Black;RJ45 (8 way) and RJ11 (6 way);Durable design

186-3149   Black 8 way unshielded RJ45 coupler

RS Pro Zipper Polyester Tool Bag with Shoulder Strap

- Tough Waterproof Polyester
- Top Opening with Zipper
- Padded Shoulder Strap Included
- Removable Base Board
- Multiple Separate Pockets

788-7205   12" Hard Bottom Tool Bag

Thermocouple Fine Wire Welder

- Designed for production of commercial grade thermocouple junctions
- For users of large numbers of exposed junction thermocouples
- Used in other applications involving the joining of wires to each other and to metal surfaces
- No special skills are needed for production of quality work

363-0351   Thermocouple fine wire welder,0-60j 4kg

Flexible Conductor

- A plain copper stranded conductor covered with a PVC sheath.

516-7906   Black flexible switchgear cable,84/0.3mm

F202 IEC Residual Current Circuit Breaker

NEW

- Assures protection to people and installations against fault current to earth
- Manufactured according to international IEC standards, for the markets where it is required

| **2552153216** | 2 Poles, AC-80/0.03 | 2CSF202005R1800 |

SH200L Compact Home Miniature Circuit Breakers

NEW

- Current limiting
- Two different tripping mechanisms, the delayed thermal tripping mechanism for overload protection and the electromechanic tripping mechanism for short circuit protection
- Available in different characteristics (B,C), configurations (1P,1P+N,2P,3P,3P+N,4P), breaking capacities (up to 4,5 kA at 230/400 V AC) and rated currents (up to 40 A)
- Comply with IEC/EN 60898-1, allowing the use for residential applications

| **2552153217** | 1P-C-6A | 2CDS241001R0064 |

F200 Series 2 Pole RCCB

- Compact DIN rail mount
- Trip indicator mechanical flag

| **537-7361** | 2 pole RCCB,40A 30mA sensitivity | 2CSF202001R1400 |

System M Pro S200 MCB Mini Circuit Breakers

- DIN rail mounting
- Complies with BS EN 60898
- Operating temperature range of -25°C to +55°C
- Standard 17.5mm width
- Max. operating voltage: 440Vac, 60Vdc

535-4138	1P, 6 A	2CDS271001R0064
535-4144	1P, 10 A	2CDS271001R0104
535-4166	1P, 20 A	2CDS271001R0204

DSE201 Series Type C RCBO's

- ABB DSE201 series are 1P+N residual current circuit breaker with overcurrent protection (RCBO) in one module.

| **914-4049** | 6KA RCBO 16A Type C AC 30mA 1 Pole | 2CSR255051R1164 |

AF Range 4 Pole Contactors

- 25 A, 4 kW, 100 → 250 V @ 50/60 Hz Coil
- Built-in surge protection and do not require additional surge suppressors
- Manage large control voltage variations
- One coil can be used for different control voltages, and used worldwide without any coil change

| **711-6231** | 2NO/2NC | 1SBL137501R1300 |
| **711-6206** | 4NO | 1SBL137201R1300 |

Type C Single Pole 6kA

- DIN rail mounting
- Complies with BS EN 60898
- Operating temperature range of -25°C to +55°C
- Standard 17.5mm width
- Max. operating voltage: 440Vac, 60Vdc

| **539-8217** | SH200 MCB 10A 1 Pole Type C 6kA | 2CDS211001R0104 |

Type K Single Pole 6kA - Classic

- DIN rail mounting
- Complies with BS EN 60898
- Operating temperature range of -25°C to +55°C
- Standard 17.5mm width
- Max. operating voltage: 440Vac, 60Vdc

514-0119	S200 MCB 4A 1 Pole Type K 6kA	2CDS251001R0337
514-0125	S200 MCB 6A 1 Pole Type K 6kA	2CDS251001R0377
514-0131	S200 MCB 10A 1 Pole Type K 6kA	2CDS251001R0427

Type K Single Pole 6kA - System Pro M Compact

- DIN rail mounting
- Complies with BS EN 60898
- Finger Safe Terminals

746-7955	S200 MCB 8A 1 Pole Type K 6kA	2CDS251001R0407
746-7970	S200 MCB 2A 2 Pole Type K 6kA	2CDS252001R0277
746-7986	S200 MCB 6A 2 Pole Type K 6kA	2CDS252001R0377

CM-MPS x3 Multifunctional Three-Phase Monitoring Relays

- On-delay function
- Time range pre-selection and fine adjustment
- LEDs for status indication
- Screw terminals
- Double-chamber cage connection terminals
- Integrated marker label

| **775-7902** | CM-MPS.41S Three Phase Monitoring Relay | 1SVR730884R3300 |

ABB OF Series Fuse Links - gG Size 1

- ABB OF series fuse links are specifically designed to react to temperature rise and as such limit current very reliably.

| **779-9996** | DIN Type 1 HRC Fuse 200A 500V | 1SCA022627R4490 |

Legend Plates

- A range of ABB Legend plates and Name plates, specifically for use with the ABB Range of Push Buttons.
- Includes the 22mm and 30mm series

| **479-3885** | Name plate holder for pushbutton | 1SFA616920R8120 |

Type K Triple Pole 6kA - System Pro M Compact

- DIN rail mounting
- Complies with BS EN 60898
- Finger Safe Terminals

| **514-0204** | S200 MCB 6A 3 Pole Type K 6kA | 2CDS253001R0377 |

Type AC Residual Current Circuit Breaker

- Compact AC DIN rail mount 2 and 4 Pole RCCB's
- Protects against the effects of sinusoidal alternating earth fault currents
- Protects against indirect contact with additional protection against direct (with IΔn=30 mA) contact
- Command and isolation of resistive and inductive circuits

540-1616	2 Pole, 25A FH200, 30mA	2CSF202006R1250
540-1622	2 Pole, 40A FH200, 30mA	2CSF202006R1400
540-1666	4 Pole, 63A FH200, 30mA	2CSF204006R1630

Enclosed Push Button

- Robustly constructed, suitable for indoor or outdoor use
- Ingress protection to IP65 with metric conduit entries
- Supplied with contact block, additional contact blocks can be fitted
- Emergency stop complies with EN418

| **521-3677** | IP66 107mm 75mm 141mm | 1TVL211000P3112 |

Eden Eva 2TLA Safety Switch

- For use on interlocked gates, hatches etc
- A coded signal is transmitted from the control device Vital or from the safety PLC Pluto via Adam to Eva which modifies the signal and sends it back again
- The maximum sensing distance between Adam and Eva from ABB is 15 mm ± 2 mm

| **733-2458** | Coded Actuator, Plastic, 24 V dc | 2TLA020046R0000 |

CT-MFS Series Multifunctional Timers

- Rated control supply voltage 24 → 240 Vac/dc
- Timing functions: ON-delay, OFF-delay with auxiliary voltage, Impulse-ON, Impulse-OFF with auxiliary voltage, Symmetrical ON- and OFF-delay, Flasher starting with ON, Flasher starting with OFF, Star-delta change-over with impulse, Pulse former, ON/OFF - function
- 2 C/O (SPDT) contacts
- 3 LEDs for status indication

| **746-6977** | CT-MFS.21S Time relay, Multifunction | 1SVR730010R0200 |

Switch mode power supplies CP-E series

- Primary switch mode power supplies
- Adjustable output voltages
- Wide input range
- High efficiency
- DC OK output (transistor) for 24 V devices (greater than 18 W)
- Protection class IP20

| **668-0924** | CP-E 24/10.0 Power supply 24VDC/10A | 1SVR427035R0000 |

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10 · 11

mechanisms for network diagnostics or reducing the data load. Therefore they can only be used to a limited extent in modern machine networks.

On the other hand, intelligent switches have precisely these functions. Thanks to optimally matched functionality, they combine the benefits of easy-to-use unmanaged devices with the powerful capabilities of the managed switches. The new FL Switch 2000 product family of Phoenix Contact additionally supports redundancy mechanisms for loop suppression, as well the essential functions of the PROFINET and EtherNet/IP™ transmission standards. The innovative Unmanaged Mode ensures user-friendly handling. It allows the device to be operated as an unmanaged switch, while the management functions for stabilizing the network are active in the background. With the FL Switch 2100 models, it is additionally possible to set up machine networks for gigabit communication.

Reliable wireless technology

The trend to integrate mobile devices and driverless transport systems into the machine network makes wireless data communication essential, for example using WLAN. To ensure that the data is reliably transmitted to the recipient, an access point that transmits a WLAN signal should be installed at the respective machines. Usually, the access point is installed in the control cabinet, and at least two antennas are mounted on the machine.

Figure 2: The compact FL WLAN 1100 wireless module / access point can be used to integrate mobile devices into the network

With the FL WLAN 1100 product family, Phoenix Contact has created an easy solution for full WLAN reception at machines and systems (Fig. 2). The wireless module not only combines an access point and antennas in one device, but can also be attached directly to the machine as well as to the control cabinet or a mobile vehicle with little effort by single-hole mounting – even as a retrofit. The two antennas integrated into the access point support all customary WLAN standards (IEC 802.11a/b/g/n) and frequencies (2.4 GHz and 5 GHz), as well as MIMO antenna technology (Multiple Input Multiple Output). This ensures fast and reliable data transmission.

Secure remote access

Connecting the machine to the production network, integration into a cloud-based solution, or remote maintenance by the machine builder: regardless of the application, secure and therefore encrypted communication is crucial. The remote maintenance modules of the TC Cloud Client and FL mGuard product families ensure that the service personnel can connect to the machines and systems remotely via the Internet. Depending on what is needed, this connection is either established via the operators' networks, or via the global 4G LTE mobile network (Fig. 3). The mGuard Secure Cloud makes it possible to set up a scaleable VPN infrastructure with encryption by means of the IPsec security protocol. This safeguards the confidentiality, authenticity and integrity of all exchanged data. For secure connections between the machine and the production network, the FL mGuard security appliances additionally provide extensive firewall functions that protect the machine network against unauthorized access (Fig. 4).

Easy configuration

Many machine builders prefer to use devices in their networks that can be set up as easily as possible. To avoid the additional time and costs involved in configuring more complex components, machine builders make conscious decisions to forfeit the advantages of a robust, diagnosable network. As mentioned above, unmanaged switches with plug-and-play capabilities are frequently used. These simply have to be
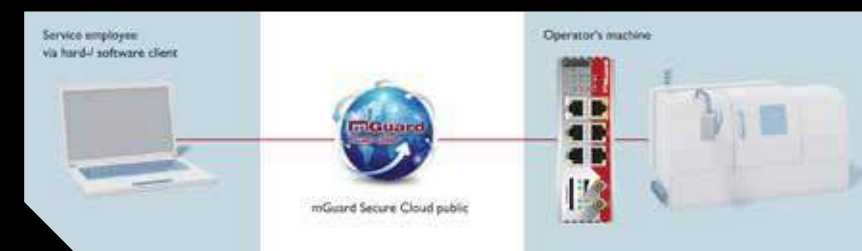

Figure 3: The mGuard Secure Cloud allows secure remote maintenance of machines and systems

connected to a power supply and the network. No settings have to be configured.

To minimize the configuration effort even for components with management functions, without forfeiting their many benefits, the new Phoenix Contact devices have been optimized for machine building applications and are easy to configure. In addition to the configuration options usually offered, such as web-based management in a browser and SNMP (Simple Network Management Protocol), the switches of the 2000 product family and the TC Cloud Client are equipped with an SD card. With the card, the configurations created can be replicated as often as needed. And if the user needs to replace a defective component, the extensive work involved in the initial configuration need not be repeated for the replacement device. The wireless modules of the FL WLAN 1100 and FL Switch 2000 product families additionally offer the option of configuration by means of a command-line interface (CLI).

Transparent network management

Larger and larger automation networks – this trend is overtaxing an increasing number of machine builders' ability to manage their networks. Additionally, they complain about the high amount of time involved and the resulting costs. Therefore many companies are looking for a solution to simplify network management. With the FL Network Manager, Phoenix Contact offers a new software tool that encompasses all the important functions for managing switches as well as WLAN and security components – from initial device configuration and monitoring functions during live operation to user-friendly configuration and firmware management.

In the past, it was necessary to perform firmware updates on each individual device. With the FL Network Manager, it is now possible to update all components simultaneously. Device configuration in the network is just as easy. All configuration files can be saved locally in a single step, and be loaded on a (replacement) device if needed. Integrated BootP/DHCP and TFTP server functions eliminate the need to use several different tools to configure device parameters. The FL Network Manager thus combines all the important management functions for an automation network into one transparent tool.
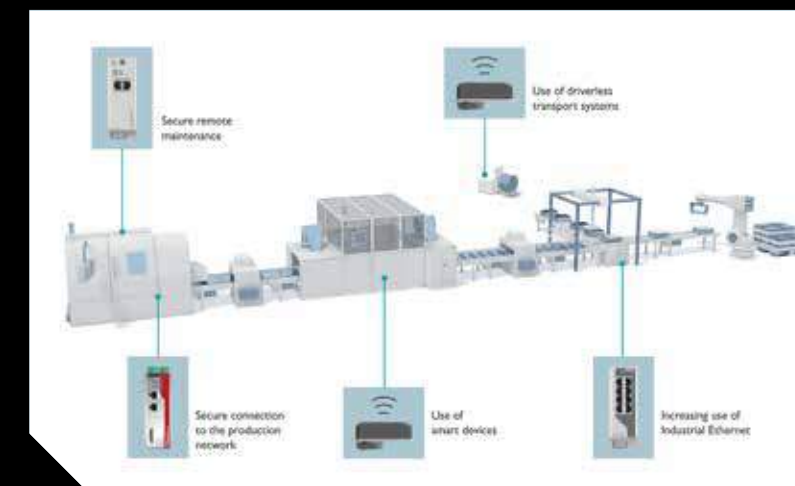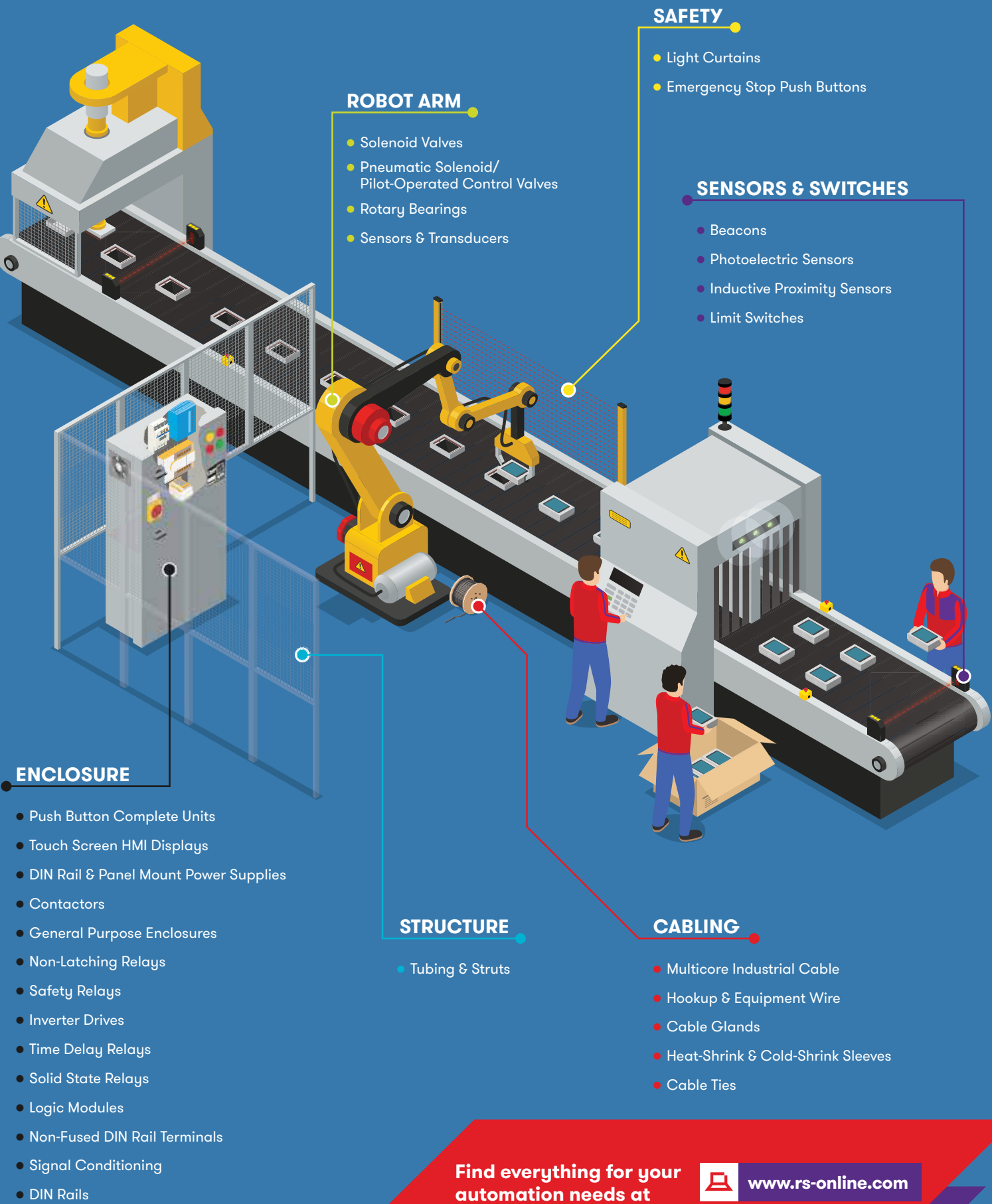

Figure 4: Remote maintenance of machine networks with smart devices

FUTURE-ORIENTED COMMUNICATION

Making setting up machine networks as easy as child's play

Seamless Ethernet-based data exchange from field level to office applications is one of the central challenges that Industrie 4.0 presents to future machine networks. As a communication specialist, Phoenix Contact therefore offers appropriate solutions that are not only comprehensive, but also easy to handle, secure and ready for the future (lead).

Whether man or machine, one thing is certain: without communication, nothing works. However, in the practice, it frequently happens that participants do not understand each other, or not correctly. Reasons include many participants speaking at once, different languages, or complex ways of expressing themselves. It is a fact that misunderstandings can easily cause errors with unforeseeable consequences. Therefore, a uniform language and regulated communication are fundamental prerequisites for trouble-free information exchange between all participants. And that also holds true for the data exchange in machines and systems.

In the past, the amount of Ethernet-capable components was still relatively limited, but thanks to the universal Ethernet communication, their number is continuously increasing. As a result, the risk of unwanted data traffic on the network also increases. Unauthorized devices that are connected or loops that are accidentally established can interfere with the production process. If the user then additionally needs special

protocols, such as PROFINET or EtherNet/IP™, the devices used have to meet special requirements to safeguard reliable data exchange. Technology trends such as cloud-based solutions, IT security, the use of smart devices, or the possibility of secure remote maintenance also influence the network communication. For the machine builders, this means that they constantly have to plan and service larger networks that can be supplemented with new technologies. And the whole thing has to stay manageable for both their own and the customers' employees.

Uniform operating philosophy

To meet these demands, new device types are used in the machine networks, in addition to switches that connect the components and control the data transmission. For example, to connect mobile end devices or transport systems to the automation network, wireless modules are used. Security components are increasingly used to ensure safe integration of the machines into the production network. They also allow encrypted – and thus secure – remote access to the machines. In machine building, the international competitive pressure is high. To meet the customers' demand for devices that are easy to handle, it makes sense to source all the required network components from a single manufacturer. This allows for a uniform operating philosophy and creates scope for

price negotiations. With the FL Switch 2000, FL WLAN 1100, FL mGuard und TC Cloud Client product families, communication specialist Phoenix Contact therefore provides the optimal solution for the special requirements of modern machine networks (Fig. 1).

Diagnosable high-availability networks

In the past, unmanaged switches usually served as the interface between network participants in machine building. The reasons included their low price and easy startup. However, these devices cannot meet the demands that arise from the growing communication needs of the constantly increasing number of network participants. For example, unmanaged switches have no

Figure 1: The extensive Phoenix Contact product portfolio encompasses all components needed for setting up a machine network

View our Phoenix Contact range at
www.rs-online.com

Industrial Automation – it's more than just robots

Hundreds of complex components go into creating remarkable machines like robotic arms and smart production lines. We have an extensive range of products for all your automated applications, with all the industry-leading brands. Whether you're looking to optimise productivity or want to improve safety around your machines, we have everything to keep your processes running.

SAFETY
- Light Curtains
- Emergency Stop Push Buttons

ROBOT ARM
- Solenoid Valves
- Pneumatic Solenoid/Pilot-Operated Control Valves
- Rotary Bearings
- Sensors & Transducers

SENSORS & SWITCHES
- Beacons
- Photoelectric Sensors
- Inductive Proximity Sensors
- Limit Switches

ENCLOSURE
- Push Button Complete Units
- Touch Screen HMI Displays
- DIN Rail & Panel Mount Power Supplies
- Contactors
- General Purpose Enclosures
- Non-Latching Relays
- Safety Relays
- Inverter Drives
- Time Delay Relays
- Solid State Relays
- Logic Modules
- Non-Fused DIN Rail Terminals
- Signal Conditioning
- DIN Rails

STRUCTURE
- Tubing & Struts

CABLING
- Multicore Industrial Cable
- Hookup & Equipment Wire
- Cable Glands
- Heat-Shrink & Cold-Shrink Sleeves
- Cable Ties

Find everything for your automation needs at www.rs-online.com

Key technology / Trusted Global Brands

Sensing
Inductive and photoelectric sensors are used extensively within the production line. Other sensors such as temperature and pressure are also used on.
RS Brand options available

VEGA · Schneider Electric · OMRON · RS PRO · bürkert · SICK Sensor Intelligence. · TURCK BANNER · EMERSON · ifm · Druck · PEPPERL+FUCHS · BALLUFF · Baumer · SIEMENS

Power transmission and conveying
Conveying operations within the manufacturing line use power transmission components and these require regular maintenance to avoid unplanned production downtime.
RS Brand options available

SKF · CONTITECH · Rexroth Bosch Group · igus · INTERROLL · RULAND · NSK

Switchgear
Push buttons, limit switches, control stations, isolators, contactors, and industrial relays are used within the production line control system and within the end product.
RS Brand options available

Schneider Electric · ABB · OMRON · SIEMENS · EATON · CROUZET · BERNSTEIN · Honeywell · finder · Lovato electric

Process Control (PLCs & Temperature Control)
Will control virtually all processes within the manufacturing line – either individual machines or an entire production line.
RS Brand options available

SIEMENS · OMRON · MITSUBISHI ELECTRIC AUTOMATION SYSTEMS · Schneider Electric · Eurotherm by Schneider Electric · JUMO · WEST Control Solutions · GEFRAN

Motion control
Many parts of the process require motor-driven motion, and this often combines in panel control via a variable-speed drive, soft-start, DOL or DC speed controller and the AC or DC motor on the machine.
RS Brand options available

Schneider Electric · maxon PRECISION MOTORS · MITSUBISHI ELECTRIC AUTOMATION SYSTEMS · EATON · Parker · CROUZET · TECO · SIEMENS · ABB · Panasonic

Machine guarding
Machine guarding and safety components are a key requirement with the Transport and Automotive Industries. The RS range includes mechanical and non-contact interlock switches, light curtains, safety relays, E-stop push buttons and rope pulls.
RS Brand options available

Schneider Electric · OMRON · ABB · SIEMENS · Honeywell · IDEC · BERNSTEIN · SCHMERSAL · SICK Sensor Intelligence. · PHOENIX CONTACT · pilz · DOLD · .steute · WERMA SIGNALTECHNIK

Get all your parts from a one stop supplier who understands your industry needs

Thermal Circuit Breaker

- A version with screw or spring-cage connection is used as a basic terminal block
- The reclosable thermal circuit breaker is available in nine nominal current levels ranging from 0.25 to 10A
- Compact design

801-6902 Circuit Breaker, Miniature, 2A   712217

PEN Conductor Busbar

- PEN conductor busbar, 3mm x 10 mm, length 1m

290-1258 Neutral busbar 1m   402174

Thermomagnetic Circuit Breakers UT-TMC

- Compact design, only 12.3 mm wide
- Large-surface marking possibilities, 1 per connection point and 1 on top of the device
- Double plug-in bridge shaft
- Available in current ranges 0.5 A to 16 A

684-3594 Circuit Breaker UT 6-TMC M 2A   916605

End Covers

- Variety of colours available
- Different colour options

803-9481 DIN Rail End clamp for E/NS 35 N   800886

DIN Rail Perforated - Phoenix Contact

- DIN rails NS15, NS32 and NS35 with height of 7.5mm or 15mm, length 2M

803-9491 Perforated DIN Rail, 35×7.5×2000, Steel   801759

KLM Terminal Strip Marker Carrier

- Terminal strip markers for strip marking
- Adjustable height
- For use with end clamps E/UK, E/NS 35 N or CLIPFIX 35
- Lettering field size: 44 × 7 mm

820-7290 Terminal strip marker   1004348

Phoenix Contact CLASSIC COMBICON DFK-MTSB 5.08mm Feed Through PCB Terminal Block Header

- Terminal blocks which permit a pluggable electronic connection through a housing wall
- External connection for corresponding MSTB plugs with a 2.5mm² connection cross section
- Internally combinable solder connection or 2.8mm blade connection
- Terminals rated at 12A / 320V (Class III/2)
- 5.08 mm Pitch

220-5011 Connector,PCB,Feedthrough,12A,250V,2way   707248

Universal Terminals

- Universal terminals moulded in polyamide to fit both 'G' and 'Top Hat' rail.
- Screw conductor securing with closed screwdriver shafts. Available conductor acceptance sizes, 2.5mm² to 35mm². The range comprises of grey (phase), blue (neutral), and yellow/green (earth) terminals. A 10-way insertion (jumper) bridge is also available, as is a 35mm rail end bracket.

446-0816 10 way jumper link for 4sq.mm terminal   201139

Fixed bridges

- Screw heads with insulating collars

418-9826 FIXED BRIDGE 10W   203250

KMK series cable markers

- Plastic cable markers that can be used for labelling
- and looming cables and individual conductors.
- For indoor useKMK: cable markers for labels with
- attached cable tie, for displaying ESL or EST insert
- labels (label dimensions 29 × 8 mm)KMK 2: as above,

220-695 KMK 2   1005266

Universal Terminals

- Universal terminals moulded in polyamide to fit both 'G' and 'Top Hat' rail.
- Screw conductor securing with closed screwdriver shafts. Available conductor acceptance sizes, 2.5mm² to 35mm². The range comprises of grey (phase), blue (neutral), and yellow/green (earth) terminals. A 10-way insertion (jumper) bridge is also available, as is a 35mm rail end bracket.

101-2723 Rail end bracket for 35sq. mm terminal   1201442

End Covers

- Professional range of Phoenix Contact end covers available in a variety of colours and sizes.
- Variety of colours available
- Different colour options

803-9602 DIN Rail End cap for NS 35/7.5 CAP   1206560

AK Busbar Connection Terminals

- The Phoenix Contact AK busbar connection terminals offers phase conductor connection to a central busbar.

803-9441 Connection Terminal Block, 41 A, Silver   404017

USLKG Series Ground Block

- Available in various widths ranging from 5.2 - 12.2mm

803-8277 Ground modular terminal block - USLKG 3   441083

Universal Terminals

- Universal terminals moulded in polyamide to fit both 'G' and 'Top Hat' rail.
- Screw conductor securing with closed screwdriver shafts. Available conductor acceptance sizes, 2.5mm² to 35mm². The range comprises of grey (phase), blue (neutral), and yellow/green (earth) terminals. A 10-way insertion (jumper) bridge is also available, as is a 35mm rail end bracket.

462-9172 DIN rail contact earth terminal,2.5sq.mm   441119

DIN Rail Perforated - Phoenix Contact

- DIN rails NS15, NS32 and NS35 with height of 7.5mm or 15mm, length 2M

803-9615 Perforated DIN Rail, 15×5.5×2000mm, Galv   1401682

Double-Deck Terminal

- For higher density wiring
- Can be commoned at both levels with the 10-way jumper bar

869-089 MTTB1.5 standard double deck terminal   1414129

Standard and Earth Terminals

- These compact terminals allow for complex switching tasks in confined spaces. Mounted on TS15 RS 467-349.
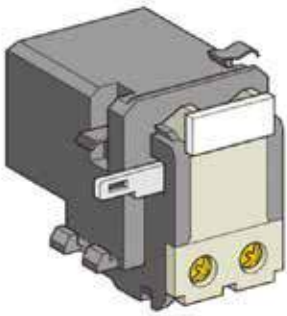- These terminals have a pitch of just 4.2mm.

446-0844 End clamp for standard terminal   1421633

Overload Relay Accessories

• Terminal Blocks can be screw mounted or clipped onto DIN rail.

744-6964 Remote tripping device,220   LA7D03M
to 230 Vac/dc

Acti9 iC60H MCB 3 Pole

• iC60H curve B, C, D circuit breakers are multi-standard circuit breakers which combine circuit protection against short-circuit currents and circuit protection against overload currents
• Insulated terminals IP20
• Large circuit labelling area
• Double clip for dismounting with comb busbar in place

791-3405 Acti9 iC60H MCB 3 Pole 63A Curve C   A9F54363

Three-pole Thermal Overload Relays

• Adjustable relay setting dial
• Test button
• Stop button
• Manual/auto reset
• Trip indicator
• Sealable cover
• 1N/O & 1N/C auxiliary contacts

394-9330 Overload relay,12-18A FLC range   LRD21

VCF Enclosed Switch Disconnector

• IP65 Rated

257-3522 3P std IP65 switch   VCF02GE
disconnector,10A le

XPS AC, Single Channel

• Provides 3 N/O safety relay outputs plus 1 solid state output PLC signalling
• Monitoring of start button or automatic starting
• 24Vdc option incorporated for each supply voltage version
• Compact 22.5mm housing

447-4477 XPSAC emergency stop   XPSAC5121
relay,24Vac/dc 3NO

913-9740 PM5110 meter modbus 1DO   METSEPM5110
33 alarms

Modicon M241 - Logic Controller

• M241 Logic Controller
• 5 ports: Ethernet, CANopen, 2 serial lines, USB port for programming
• High processing CPU and cartridge extensions
• Web and FTP server
• Pulse train outputs / high-speed counters
• SD card
• Safety function

3 Pole Contactors, DC Controlled

• Built-in coil suppression
• 3 N/O poles
• Auxiliary contact configuration one N/O, one N/C
• Operating time closing 12 to 22 ms
• Operating time opening 4 to 19 ms

394-9807 CONTACTOR 9A 24VDC LPL   LC1D09BD

ATV61 variable speed drive controllers - IP 21

• Frequency controllers for three-phase 0.75 to 7.5kW synchronous and induction motors.
• Class of protection IP21 for bare controllers and IP41 on the upper part.
• Enables drive control of three-phase induction cage motors with three-phase power supply.
• Output control frequency: 0.5 to 1600Hz.

104-414 GRAPHIC TERMINAL   VW3A1101

Motor Circuit Breakers GV2-P

• Motor protection is provided by the thermal-magnetic protection elements incorporated in the motor circuit breaker
• Manual operation via a rotary selector switch
• Screw terminals

305-2177 MOTOR CIRCUIT BREAKER GV2P07   GV2P07

Schneider XVR Multi-functional LED Beacons with Buzzer

• Longer life and maintenance free thanks to motor-less LED technology
• Rotating, blinking, and flashing LEDs
• 10 lighting modes make it easy to use and simple to select
• Simple and easy installation without use of any tools
• Adjustable 90 dB buzzer at 1m

901-2522 Red LED Beacon w/ Buzzer,   XVR3M04S
110-230Vac

Premier Open Reels - BS1363

• Open reels with metallic stand and handgrip
• Integral thermal cut-out for safety
• Flash tested to 4kV
• PVC cable to BS6500

470-8174 4 skt open reel,UK 13A 240V 25m   JJR42513

806-6761 CONTROLLER M241-24IO   TM241CEC24T
TR,PNP ETH. CAN MAS

Easy EZ9 Series MCB's, RCBO's, RCCB's and Accessories

• High Quality (100% designed by Schneider Electric)
• User Friendly Design
• Full Compliance with International IEC Standards 3rd Party Certification
• Robust and Reliable Circuit Protection
• Range Consists of Insulated Enclosures, Metal Enclosures, Switch-Disconnectors, RCCB's, MCB's, RCBO's and Accessories

Altistart Soft Start

• May be used with single or three phase motors

478-4718 Soft starter,12A 1.5kW 210-460Vac   ATS01N112FT

Rotary Selector Switches XB4-B

• Standard handle selector switches
• Screw clamp terminal connections
• Silver alloy contacts
• Supplied with contact blocks
• Short circuit protection

330-8694 Selector Switch 3 Pos Stay Put 2NO   XB4BD33

Up/Down Double/Triple Switches

• Spring return 22mm flush pushbuttons, white and black for double and black white and red for the triple
• Double has 1 N/O contact on each pushbutton, triple has additional N/C contact on stop button
• Provision for an additional contact on each pushbutton (see accessories)
• Dimensions 104×68×62mm (incl button) (Double), 134×68×62mm (incl button) (Triple)
• Double insulated
• IP65 rated
• Polycarbonate construction

330-8521 Enclosed Push buttons "Up - O - Down"   XALD324

Socket Modules

• BS4343/BSEN 60309 types are derated to IP44 when plug is inserted and must be mounted on deep boxesIEC529; BS5490; CEE17; EN60309Socket covers automatically shut when plug is withdrawn

340-0245 IP66 socket module,13A 250V   56SO313LEGY

ABL 8REM / ABL 7RP series power supplies

• Phaseo Optimum range regulated cut out power supplies
• Intended to power automation systems equipment.
• Equipped with an output voltage adjustment potentiometer.

146-749 PHASEO OPTIMUM PSU, 24V 3A/72W   ABL8REM24030

850-8599 EASY 9 6A MCB Curve B 1 Pole   EZ9F16106

Automatic cut-out, 5SY4 Series

- Automatic cut-out, 1, 2, 3 and 4-poleDIN rail assemblyFor use in industry, and in the functional and residential construction sector

772-1296 MCB 2 Pole Type C 10kA 6A 400V 5SY4206-7

SIRIUS 3RN10 00 // 62 thermistor motor protection relay

- 3RN10 00: Compact, low-cost unit, with LED 'tripped' indicator and 1 changeover relay contact; reset is automatic when sensor has cooled down; control and signalling voltages should have the same potential; 3 voltage options - 24 VDC, 110 VAC or 230 VAC

638-7432 Overload Relay 200A 3RB20561FC2

Line Supply and Three Phase Voltage

- Wide voltage range versions reduce inventory stock levels
- Variable settings for over-range, under-voltage or window monitoring
- Delay times and reset switch
- Actual value and fault types are permanently displayed
- Removable terminals

518-7297 Phase sequence Relay, 160-690V, 2NO 3UG45131BR20

3SE2 9 Safety Foot Switch

- Fixing holes for securing to the floor
- Latching or momentary-contact versions
- >10,000,000 operating cycles
- Temperature rating -25 to +80 °C

764-4073 Safety foot switch,single pedal,2N0+2NC 3SE2924-3AA20

SIRIUS 3TK28 Safety Relay, Basic Units

- Minimum programming time and high degree of user friendliness thanks to parametrisation display
- Device versatility means reduced storage requirements
- Compact design
- Electrically isolated safety outputs

411-2242 E-stop safety relay, 3NO 1NC, 2Vac/dc 3TK28211CB30

Sentron PAC3200

- Measurement voltage up to 690 V (UL-L)
- High measuring accuracy for energy, class 0.5S in accordance with IEC62053-22 for active energy
- Integrated Ethernet interface.
- Multifunctional digital inputs and outputs
- Large, illuminated graphics display
- Simple operation with intuitive user prompting, multi-language text displays

665-4928 Power Monitoring Device PAC3200 732-0030

3RS170X Active Interface Converter

- Galvanic isolation of analogue signalsSurge suppressor on analogue input2-way isolataion (output not isolated from supply)Yellow LED for visual voltage warning

418-4859 Signal converter, 0-10Vi/p 4-20mAo/p 3RS17001DD00

SINAMICS G110 Frequency Inverter Single Phase without Filter

- SINAMICS G110 is a frequency inverter with basic functionality for operating 3-phase motors in 1-phase networks
- Very compact devices
- Capacity range 0.12 → 3 kW

505-2078 INVERTER G110,0.37KW,NO FILTER 6SL32110AB137UA1

Sirius 3RW40

- May be integrated into a motor control system using other Sirius control gear products, e.g. 3 pole circuit breakers from the 3RV10 range (see Control Gear section)
- Two phase control, plus soft starting and stopping of three phase asynchronous motors
- Low power loss

420-502 SIRIUS Softstarter 3RW40 11kW 400V 3RW4026-1BB14

IOT2040 Intelligent Gateway

- Programming in high-level languages
- Intel Quark x1020 (+Secure Boot)
- 1 GB RAM
- microSD Card slot
- 2 Ethernet Interfaces, 2 × RS232/485 interfaces
- Yocto Linux support
- LEDs, battery buffered RTC, watchdog

124-4038 IoT2040 Industrial Intelligent Gateway 6ES7647-0AA00-1YA2

S7-1200 - Starter Set with HMI

- CPU 1212C AC/DC/RLY Input simulator
- KTP400 basic
- SIMATIC STEP 7 basic in the TIA portal
- 2 m cord
- Documentation collection CD
- All contents supplied in systainer

864-3999 S7-1200+KTP700 Starterkit HMI KTP700 6AV6651-7HA01-3AA3

Digital Output Expansion Module

- Suitable for ac/dc solenoid valves, contactors, motor starters, fractional h.p. motors and indicator lights

453-2624 Output module,6ES73221BL000AA0 32×24Vdc 6ES73221BL000AA0

Contact Blocks for Front Plate Mounting

- Contact blocks with one or two contacts
- Gold plated contacts version available
- Screw connection
- Front plate mounting

742-9483 Contact Block 1NO+1NC Screw Terminal 3SB3400-0A

22 mm Selector Switch Complete Units, Metal (Shiny)

- Easy installation
- Suitable for use in extreme environments
- No special tools required
- Simple geometry for mounting holes
- Connection to the most commonly used communication systems

135-5654 Selector switch 22mm black I-O-II 1NO1NO 3SU1150-2BL60-1NA0

Sentron LD Disconnector

- Main and emergency stop switch
- Handle available in black or red/yellow (emergency stop)
- Accepts 3 padlocks
- Front panel seal IP65
- Side feed with cover
- Screw or DIN rail assembly

518-7281 3-POLE ISOLATOR 3LD2504-0TK53 3LD25040TK53

IE FC RJ45 Plug 2×2

- Error minimising connection technique Industry compatible design
- Good EMC shielding and deflection
- Integrated strain relief
- Compatible with EN 50173 / ISO IEC 11801

758-9193 IE FC RJ45 PLUG 180 2X2 6GK1901-1BB10-2AA0

SITOP Selectivity Modules

- Reliable shutdown in case of overload regardless of cable lengths or cable cross-sections
- 4 load feeders per module with individually adjustable maximum current for each output
- Two versions for remote diagnostics: Group signaling contact or single-channel signaling

714-1268 Selectivity module SITOP PSE200U 4×10A 6EP1961-2BA21

3RF23 Series

- Single phase currents up to 50A AC can be switched
- 2 voltage ranges available both with 24Vdc control voltage
- Isolation voltage; 600Vac
- LED status indicator
- Switching currents rated at 40°C
- IP20 rating

467-4762 Siemens 3RF23 contactor,20A 24-230Vac 3RF23201AA02

Raspberry Pi 3 Starter Kit

- With this kit, you'll be exploring, programming and experimenting with a Raspberry Pi within just a few minutes
- This Official Raspberry Pi 3 Starter Kit has everything you need. Just plug in the cables, attach to your TV or monitor and turn on

896-8119	Starter Kit	Raspberry Pi 3 Starter Kit

Raspberry Pi 3 Model B+

- Raspberry Pi 3 Model B+ is the latest computer board from Raspberry Pi. It is a development of the previous Raspberry Pi 3 Model B, offering improved speed and functionality

137-3331	Raspberry Pi 3 Model B+	Raspberry Pi 3 Model B_Single

Raspberry Pi Compute Modules 3

- These modules are DDR2-SODIMM, mechanically-compatible System on Modules (SoMs) containing a BCM2837 processor System on Chip (SoC) with 1 Gbyte LPDDR2 RAM and 4 Gbytes eMMC Flash memory
- Extra input/output (I/O) interfaces in addition to the Raspberry Pi model A/B boards
- Compute Module 3 Lite – not fitted with eMMC Flash and SD/eMMC interface. But pins are available for the designer to connect their own SD/eMMC device

123-2013	I/O board	Compute Module 3 I/O
123-2012	Lite	Compute Module 3 Lite

Raspberry Pi LCD Touch Screen - 7 inch

- Multi-touch capacitive touch screen - supports up to 10 finger touches
- 7 inch display
- 800 × 480 pixel resolution at 60 frames per second (fps)
- 24-bit RGB colour
- 70 degree viewing angle
- Only two connections required

899-7466	7 inch	Raspberry Pi Touchscreen

Official Raspberry Pi 3 cases

- Easy snap-fit assembly
- Range of case display/access options: fully closed, sides away, birds eye view
- Cut-outs of all connection points
- Plastic LED light protector
- MicroSD card cut-out
- Stick on rubber feet for case stability
- Suitable for both Raspberry 3B and Pi 3B+

909-8132	Red & White	TZT 241 AAA-01
909-8138	Black & Grey	TZT 241 AAB-01

Raspberry Pi Plug In Power Supplies

- 2.5 A 5.1 V power supply
- 1.5 m cable
- Short circuit, over-current and over-voltage protection
- Low standby current consumption

909-8126	White	T5875DV
909-8135	Black	T5989DV

Tinkerkit Braccio Arduino Robotic Arm

- A fully operational robotic arm, controlled using an Arduino Board
- Designed for desktop use and is supplied in kit form so you can assemble it to your own requirements
- It can be used in several ways and is easily adapted Pickup and move objects, mount a camera and track your movements in a video call or attach a solar panel and track the movement of the sun

111-3738	Robotic Arm	T050000

Arduino Starter Kit with UNO board

- Use the Arduino Uno as a main board, with the board featuring an AVR ATmega 328 microcontroller
- Using the included Arduino Projects Book, you can gain step-by-step knowledge on code, circuits and bread-boards via 15 suggested projects

761-7355	Arduino Uno Starter Kits	K000007

Arduino Uno

- ATmega 16U2 programmed as a USB to serial converter
- 14 digital I/O pins (6 can be used as Pulse Width Modulation (PWM) Outputs)
- 6 analogue inputs
- 16 MHz ceramic resonator
- USB connection
- Power jack
- ICSP header
- Reset button

715-4081	Arduino Uno	A000066

Solid-state Multi-functional Timers

- A wide AC/DC power supply range greatly reduces the number of timer models kept in stock
- A wide range of applications with multiple operating modes, eight modes for 11-pin models and five modes for 8-pin models
- Ecological design with reduced current consumption

328-358	8-pin, 100-125V dc, 100-240V ac	H3CR-A8 AC100-240/DC100-125
328-364	8-pin, 12-48V dc, 24-48V ac	H3CR-A8 AC24-48/DC12-48
113-8134	11-pin, 100-125V dc, 100-240V ac	H3CR-A AC100-240/DC100-125
113-8128	11-pin, 12-48V dc, 24-48V ac	H3CR-A AC24-48/DC12-48

Monitoring Relay with SPDT Contacts

- For accurate and reliable monitoring for industrial facilities and equipment
- Designed to bear greater resistance to inverter noise, suitable for monitoring 3-phase power supplies

819-3267	220 → 480 V ac	K8AKPM2380480VAC
819-3258	115 → 240 V ac	K8AKPM1200240VAC

E5C2 On/Off Temperature Controllers

- Front panel offset adjustments on PD controllers
- Fits standard 8-pin round sockets
- Panel mounting hardware included

535-0710	K Type Thermocouple Input	E5C2-R20K AC100-240 0-400
328-1094	RTD Input	E5C2-R20P-D AC100-240 0-200

4PDT Non-Latching Relays

- 4PDT Contact configuration
- Hermetically sealed version of MY4
- Contact material: Ag
- Operating temperature range: -25 to +60°C
- Switching Current 3A

376-739	24V dc Coil, 3 A	MY4H 24DC
376-745	120V dc Coil, 3 A	MY4H AC110/120
827-8450	Relay Socket for use with MY Series	PYF14A-E-US

Retro-reflective Photoelectric Sensor

- IP67 rated PBT housing with methacrylate lens
- PNP and NPN output configurations
- Light ON/dark ON selectable
- Small dead-band for sensing close targets
- PNP IP69K Block Style

374-2044	100 mm → 4 m Detection Range	E3ZR86

40mm Mushroom Head Emergency Buttons

- Direct opening mechanism to open the circuit when the contact welds
- Safety lock mechanism prevents operating errors
- Finger protection mechanism on Switch Unit provided as a standard feature
- Install using either round, or forked crimp terminals
- Non-lighted models IP65 (oil-resistant), lighted models IP65

746-7163	A22E Series Stop Switch	A22E-M-11B
746-7185	A22Z-EG22 Shroud	A22Z-EG22
746-7176	A22Z-EG2 Shroud	A22Z-EG2

Unshielded DC 3-wire Sensors

- Standard proximity sensors for detecting ferrous metals
- PBT sensing face material
- LED indication
- 3 wire DC, Unshielded
- 12 → 24 V dc supply voltage , IP67 Rating

744-9730	M18 × 1, PNP, 53mm Length	E2E-X10MF1-M1 OMS
744-9783	M8 × 1, NPN, 30mm Length	E2E-X1R5E1 2M OMS
479-2680	M12 × 1, NPN, 50mm Length	E2AM12KN08WPC12M

XS5 Series Cable assembly

- Cat5e Performance
- PVC cable
- Overall braiding
- Individual foil shielding on each pair

123-5557	RJ45 to M12 4 Pin	XS5W-T421-GMC-K

NB Series Touch Screen HMI

- Touch Screen Panel 7.0 inches with 65536 colours
- Long-life LED backlight
- 128 MB internal memory
- IP65 protection

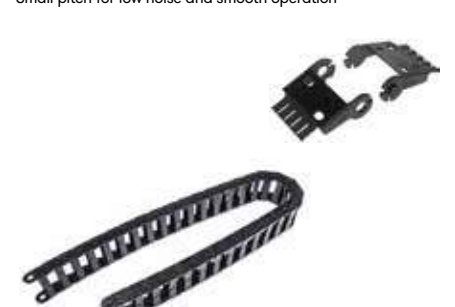| 821-1807	800 × 480 pixels	NB7W-TW01B

IGUS Series 07 Energy Chains

- High quality hard wearing material (Igumid G)
- Easy to shorten and extend lengths
- Fast installation and maintenance
- Smooth running
- Linked lid ensures sections are not lost
- Chain supplied in 1 m length

202-9019	W27 mm x D15mm	07.20.038.0
202-9025	G 27 × 15mm Mounting Bracket	060.20.12
741-7556	27mm Mounting Bracket	060.20.12PZ

IGUS Series 07 Energy Chains

- Zipper-fast* opening and closing
- Small pitch for low-noise and smooth operation
- For high acceleration
- Mounting bracket with integrated strain relief

215-0961	W22.5 mm x D15mm	07.16.038.0
485-0001	G 22.5 × 15mm Mounting Bracket Set	060.16.12

IGUS Series 10 Energy Chains

- Large pins and double stop dog for superior life and long unsupported length
- Mounting bracket with integrated strain relief
- Dirt repellant exterior
- Interior separation available

486-8686	W36 mm x D23mm	10.025.038.0
741-7569	35.5mm Cable Trunking Mounting Bracket	1025.34PZ

IGUS Series E14 Energy Chains

- Limited torsion tolerance
- Very easy to fill - ideal for harnessed cable assemblies
- Limited torsion tolerance
- Small pitch for low-noise and smooth operation

236-4902	W62 mm x D25mm	E14.4.048.0
236-4918	35 × 61mm Cable Mounting Bracket Set	114.4.12PZ

IGUS Series 15 Energy Chains

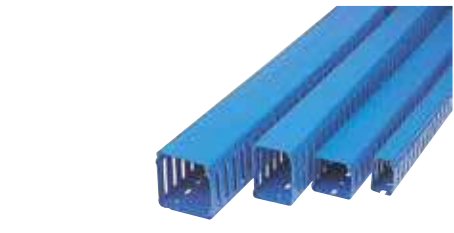- High quality hard wearing material (Igumid G)
- Easy to shorten and extend lengths
- Fast installation and maintenance
- Smooth running
- Linked lid ensures sections are not lost

202-9053	W36 mm x D24mm	15.2.038.0
215-1065	35.5 × 23mm Cable Mounting Bracket Set	102.12PZ

Betaduct Black PVC Closed Slot Cable Trunking

- Ideal for use in cabinets and control panels
- Snap-on lid
- Closed slots, height (H), width (W) and pitch (P) as shown
- Pre-punched fixing slots to DIN 43659 for ease of chassis mounting
- Self extinguishing PVC to UL94-V0 flammability rating
- Suitable for temperatures -15 to +60° C

541-141	W50 mm x D50mm, L1m	8732
544-342	W15 mm x D15mm, L1m	8702

Betaduct Grey PVC Open Slot Cable Trunking

- Ideal for use in cabinets and control panels
- Snap-on lid with non-slip beading on widths 75mm and over
- Pre-punched fixing slots to DIN 43659 for ease of chassis mounting
- Self extinguishing PVC to UL94-V0 flammability rating
- Suitable for temperatures up to +60°C

762-1572	W25 mm x D75mm, L1m	7840000
762-1578	W25 mm x D50mm, L1m	7870000
762-1590	W37.5 mm x D75mm, L1m	7760000
762-1610	W50 mm x D25mm, L1m	7850000

Betaduct Blue PVC Open Slot Cable Trunking

- Ideal for use in cabinets and control panels, blue open slot trunking is used to indicate intrinsically safe wiring
- Snap-on lid with non-slip beading on widths 75mm and over
- Pre-punched fixing slots to DIN 43659 for ease of chassis mounting
- Self extinguishing PVC to UL94-V0 flammability rating

762-1613	W25 mm x D50mm, L1m	6870000
762-1617	W50 mm x D50mm, L1m	6880000

Betaduct Black PVC Open Slot Cable Trunking

- Ideal for use in cabinets and control panels, blue open slot trunking is used to indicate intrinsically safe wiring
- Snap-on lid
- Pre-punched fixing slots to DIN 43659 for ease of chassis mounting
- Self extinguishing PVC to UL94-V0 flammability rating

599-011	W25 mm x D50mm, L1m	8870000
599-027	W50 mm x D50mm, L1m	8880000
599-005	W25 mm x D37.5mm, L1	8860000

Pneumatic Manual Control Valves

- G ¼, Aluminium ¼ in G, -10 → +60°C
- Rotary slide valve design
- Can be fitted to MS4 and MS6 Series Modular units
- Non-reversible flow direction

121-5648	Pneumatic	MS4-EM1-1/4
121-5649	Rotary Pneumatic	MS4-EM1-1/4-S

VUVS G ¼ 5/2 Solenoid/Spring Inline Pneumatic Solenoid Valve

- Extremely durable and sturdy
- Easy installation and replacement
- Ingress protection to IP67
- Long service life
- Wide range of valve functions

121-5898	VUVS G¼ 5/2	VUVS-LK25-M52-AD-G14-1B2-S

Silver 50m Polyurethane Air Hoses

- Highly flexible plastic tubing
- Fits a variant of fittings
- Compressed air in accordance with ISO 8573~1:2010
- Ambient temperature: -35°C to + 60°C
- Operating pressure: -0.95 to +10 bar

121-6291	Outside Dia. 4mm	PUN-H-4X0,75-SI
121-6293	Outside Dia. 6mm	PUN-H-6X1-SI
122-8470	Outside Dia. 8mm	PUN-H-8X1,25-SI
122-8459	Outside Dia. 10mm	PUN-H-10X1,5-SI

Filter Regulator

- Constant output pressure with return flow
- Choice of fully automatic or manual drain
- Plastic or fully integrated metal bowel guard
- Can be fitted with analogue pressure gauge or sensor with LCD display
- Rotary knob with detent can be locked to prevent setting changes

121-5654	¼ Bar	MS4-LFR-1/4-D7-ERM-AS

Black Push Button Pneumatic Manual Control Valves

- Festo manually operated actuators to fit the SV series valves
- The valve actuators fit a standard panel cut-out size of 22.5 or 30.5 mm

121-5862	Actuators to fit SV series valves	T-22-SW
122-8228	22.5mm ,IP40	N-22-SW

Black 50m Polyurethane Air Hoses

- Highly flexible plastic tubing
- Fits a variant of fittings
- Compressed air in accordance with ISO 8573~1:2010
- Ambient temperature: -35°C to + 60°C
- Operating pressure: -0.95 to +10 bar

121-6392	Outside Dia. 4mm	PUN-H-4X0,75-SW
121-6294	Outside Dia. 6mm	PUN-H-6X1-SW
122-8457	Outside Dia. 8mm	PUN-8X1,25-SW
122-8460	Outside Dia. 10mm	PUN-H-10X1,5-SW

Pneumatic Regulators

- Maintain a constant working pressure, regardless of the pressure variations in the system and the air consumption
- Excellent regulation characteristics with low hysteresis and primary pressure compensation
- Available with and without secondary venting
- High flow rate with minimal pressure drop
- Regulator lock

125-9953	G 1/8 1000-7500L/min, 0.8 to 20bar	MS4-LR-1/8-D6-WR
121-5659	G ¼ 1800L/min, 0.3 to 7bar	MS4-LR-1/4-D6-AS

AMTE Brass, Bronze 10bar Pneumatic Silencers

- For reducing noise levels of air exhausted from pneumatic systems
- Manufactured with a brass threaded body and bronze silencer insert AMTE silencers reduce noise levels to below 88 dBA
- Can be used in lubricated pneumatic systems

121-6000	Threaded, G 1/8 Male	AMTE-M-LH-G18
121-5999	Threaded, G ¼ Male	AMTE-M-LH-G14
121-6202	Threaded, G ½ Male	AMTE-M-LH-G12
121-6203	Threaded, G 3/8 Male	AMTE-M-LH-G38

Pneumatic Manual Control Valves

- Manually operated valves for panel mounting with an actuator
- A reliable quick coupling system permits rapid assembly and disassembly of the actuator
- 3/2 or 5/2 way versions
- Panel mounted

121-5860	3/2 M5 Metric, -10 → +60°C	SV-3-M5
121-5861	5/2 M5 Metric, -10 → +60°C	SV-5-M5-B

RaySpool Heatshrink Tubing Kit

- Easy to store
- Easy to dispense
- Well suited for repairs;
- Single wall or adhesive lined tubings
- Wide variety of sizes
- RoHS compliant

170-6771 RaySpool flame retardant dispensing kit   CG-PT-R-KIT-2

W58 Series Thermal Magnetic Circuit Breaker

- Current Rating: 20A
- Number of Poles: 1
- Width: 0.66in

782-7984 CircuitBreaker,Therm,Push,Cur-Rtg20A   W58-XB1A4A-20

Cable Plugs and Sockets

- Cable outlets suitable for conduit attachmentsStandard shell size allows use of back shells for all parts

395-7296 4 way DIN 72585 IP67 cable socket,30A   1-967325-1

T92 Series Flange Mount Relay

- Meets VDE 8mm spacing, 4kV dielectric coil to contacts
- UL Class F construction system standard
- UL approved for 600V ac switching (1.5HP)
- Conforms to VDE 0435, 0631 and 0700
- Operating Temperature: -40°C to +65°C

235-5475 DPNO flange mount relay,30A 24Vdc coil   T92P7D22-24 7-1393211-1

DIN 41612 Eurocard Connectors

- Meets DIN 41612 and IEC 60603-2
- High-quality design and Signal Integrity
- Reliable 2 piece design
- Range of types available B, C, D, F, M, Q and R
- Selective contact loading
- Flame retardant housings
- Polarization to prevent mismating
- Range of solder post lengths
- ACTION PIN and eye of needle contact tails

720-0715 Eurocard DIN41612 C,skt,3row,vert,96way   535032-4

SUPERSEAL Series 1.0 Receptacle Contacts

- Sturdy and reliable contacts
- Double contact spring design
- Secondary lock ensures correct and complete insertion of the contact
- Silicone rubber seals

680-9705 Superseal 1.0 socket crimp contact   3-1447221-4

CPC Series 45 Ethernet Receptacles

- A range of CPC series 45 RJ45 Ethernet receptacle connectors for use with category 5 and 5e cables. These CPC series 45 Ethernet receptacle connectors have IP67 sealing, a positive lock coupling ring, polarisation and UL 94 V-0 housings.

709-9773 Receptacle square flange IP67 RJ45   1546908-1

TETRA-CRIMP Hand Crimping Tool

- High specification design using high-quality materials
- Minimum operator skill required
- CERTI-CRIMP ratchet control for full crimp cycle assurance
- Terminal locator and wire stops
- Colour coded crimping cavities
- Ergonomically designed handles with pre-set handle force pressures
- Repairable
- Life service of over 50000 cycles if maintained

782-7394 Crimper,Ratchet,22-10AWG,PIDG   59824-1

Contactor, KILOVAC LEV Series

- Applications include power/motor control circuit isolation, circuit protection, safety in industrial machinery and automotive battery switching and backupCompact package, occupies only 65.5cm3Hermetically sealed and intrinsically safe8kV iso

782-7082 Relay,Contactor,Sealed,1 Form A SPST-NO   LEV200A5NAA

AV19 Series Anti-Vandal Switches

- Provides a highly customisable vandal-proof product with premium look & feel.
- Vandal-proof design with rear mounting jam nut.
- Various pushbutton symbols including plain, ring & power logo.

123-6073 AV19 SPL 3A Power LED White 24V   AV1911P124Q04

Straight 50Ω Cable Mount BNC Connector, Plug, Silver, Crimp Termination

- Nominal impedance: 50Ω and 75Ω
- Working Voltage: 500Vrms
- 0.2GHz: Straight 1.15 max
- 2.6GHz: Straight 1.30 max
- Durability(cycles): 50
- Temperature range: -55°C to +85°C

394-0872 Crimp BNC straight plug-RG58 cable,50ohm   1-1337427-0

TE Connectivity FX1901 Series Compression Load Cells

- Compact size
- Potentially unlimited cycle life
- Low noise
- Low deflection
- Fast

893-7398 Force Sensor load cell 20mV/V 100lbf   FX1901-0001-0100-L

Corcom R Series Two-stage General Purpose RFI Power Line Filter

- Dual T section RFI filter provides premium performanceWell suited for low impedance loads where noisy RFI environments are presentControls pulsed, continuous and/or intermittent interferenceER models offer low leakage current without deterioration of i

782-8694 Two-StageGeneralPurposeR FIPowerLineFltr   10VR1

Type 44® Multipair Industrial Cable

- Dual wall construction
- Small size, lightweight
- Low smoke and corrosive gas generation
- Resistant to most chemicals & electrical arc tracking
- Highly flame retardant
- 600 V Voltage Rating

362-572 Type44(R) Scrnd6Jkd Tw Pair Bk/Wh 22awg   44A1121-22-0/9-9

RN0805 SMT 5.1Ω to 9.76kΩ

- The RN73 series is a high stability precision chip resistor range offering various power dissipations relating to chip sizeStable high frequency perfomance

614-4516 RN 0805 SMD precision chip resistor 10R   RN73C2A10RB

FSM Series Tactile Switches

- SPNO tactile switches available in THT, SMD & right angle mountingsSMD types suitable for immersion

479-1435 6×6mm tactile switch,9.5mm FSM8JH H 1.6N

Toggle Switches, Min, Professional

- Slow make-and-break action
- Chrome-plated lever
- Solder bucket terminals
- 0.4VA max load
- Glass Filled Polyester case

316-973 1P on-on silver contact toggle switch,6A   FTD0904

AMPLIMITE Series HDF-20 Low Profile IDC Metal Shell D-Sub Connectors

- Low profile black metal body cable mounting
- IDC D plugs and socket connectors

409-3466 AMPLIMITE HDF-20 d-sub IDC socket,50 way   1658606-1