

# Overview of product groups

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|---|---|
| <b>1 Assembly and handling technology</b> | <b>6 Sensor technology</b>  |
| <b>2 Robotics</b>                         | <b>7 Control systems technology and industrial communications</b> |
| <b>2.1 Industrial robots</b>              | <b>8 Safety and security technology</b>                           |
| <b>2.2 Professional service robotics</b>  | <b>9 Supply technology</b>  |
| <b>3 Machine vision</b>                   | <b>10 Software and cloud computing</b>                            |
| <b>4 Positioning systems</b>              | <b>11 Services and service providers</b>                          |
| <b>5 Drive technology</b>                 | <b>12 Research and technology</b>                                 |

## Product groups

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|---|---|---|
| <p><b>1 Assembly and handling technology</b></p> <p><b>1.1 Assembly stations and systems</b></p> <p>1.1.1 Assembly stations and systems, linear transfer</p> <p>1.1.2 Assembly stations and systems, rotary transfer</p> <p>1.1.3 Assembly systems (continuous motion)</p> <p>1.1.4 Modular assembly platforms</p> <p>1.1.5 Assembly stations, manually feeded</p> <p>1.1.6 Assembly systems for pliable parts</p> <p><b>1.2 Assembly systems for specific fields of application</b></p> <p>1.2.1 Assembly systems for medical/pharmaceutical applications</p> <p>1.2.2 Assembly systems for food industry applications</p> <p>1.2.3 Assembly systems for explosive areas</p> <p>1.2.4 Assembly systems for ESD areas</p> <p>1.2.5 Assembly systems for electrical engineering and electronics</p> <p>1.2.6 Assembly systems for clean-rooms</p> <p>1.2.7 Assembly systems for micro technology</p> <p>1.2.8 Packaging machines</p> <p>1.2.9 Systems for the production of springs</p> <p>1.2.10 Assembly systems for the production of photovoltaics</p> <p>1.2.11 Assembly systems for composites</p> <p>1.2.12 Assembly systems for battery production</p> | <p><b>1.3 Equipment for storage</b></p> <p>1.3.1 Storage boxes</p> <p>1.3.2 Hoppers</p> <p>1.3.3 Magazines</p> <p>1.3.4 Pallet systems and palletizing units</p> <p><b>1.4 Equipment for organizing, sorting and feeding</b></p> <p>1.4.1 Separating equipment</p> <p>1.4.2 Disentangling equipment (seperators)</p> <p>1.4.3 Sorting equipment</p> <p>1.4.4 Vibrating feeders, rotary</p> <p>1.4.5 Vibrating feeders, linear</p> <p>1.4.6 Step feeders</p> <p>1.4.7 Hopper elevators (Steep feeders)</p> <p>1.4.8 Centrifugal feeders</p> <p>1.4.9 Flexible feeding systems</p> <p><b>1.5 Equipment for linking and transport</b></p> <p>1.5.1 Chain conveyors</p> <p>1.5.2 Belt conveyors</p> <p>1.5.3 Magnetic monorail systems (linear motors)</p> <p>1.5.4 Roller conveyors</p> <p>1.5.5 Rotary indexing tables</p> <p>1.5.6 Belt feed unit</p> <p>1.5.7 Workpiece carrier systems</p> <p>1.5.8 Elevators</p> <p>1.5.9 Lifting and tilting units</p> <p>1.5.10 Vacuum lifting devices</p> <p><b>1.6 Components for linking and transportation equipment</b></p> <p>1.6.1 Chains</p> <p>1.6.2 Belts</p> <p>1.6.3 Rollers/wheels</p> <p>1.6.4 Workpiece carriers</p> <p>1.6.5 Drives</p> | <p>1.6.6 Conveyor section profiles</p> <p>1.6.7 Slide rails</p> <p>1.6.8 Lateral guides</p> <p>1.6.9 Leg sets</p> <p>1.6.10 Return unit stations</p> <p>1.6.11 Curves</p> <p>1.6.12 Dividers</p> <p>1.6.13 Backstops</p> <p>1.6.14 Workpiece carriers orientation</p> <p>1.6.15 Lift transverse units</p> <p>1.6.16 Transportation controls</p> <p>1.6.17 Identification and data-storage systems</p> <p><b>1.7 Equipment for fastening and joining</b></p> <p>1.7.1 Screw driving units, manually operated</p> <p>1.7.2 Screw driving units, automatically operated</p> <p>1.7.3 Screw driving units, stationary</p> <p>1.7.4 Rivetting units</p> <p>1.7.5 Presses, manual</p> <p>1.7.6 Presses, electrical</p> <p>1.7.7 Presses, pneumatic</p> <p>1.7.8 Presses, hydropneumatic</p> <p>1.7.9 Presses, hydraulic</p> <p>1.7.10 Punching units</p> <p>1.7.11 Welding units</p> <p>1.7.12 Soldering units</p> <p>1.7.13 Dosing, gluing, application, coating and sealing units</p> <p>1.7.14 Tox/Clinching units</p> <p><b>1.8 Equipment for marking</b></p> <p>1.8.1 Printing systems</p> <p>1.8.2 Embossing and engraving systems</p> <p>1.8.3 Laser marking systems</p> <p>1.8.4 Labeling systems</p> |
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## Product groups (Continuation)

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- 1.9 Test systems**
    - 1.9.1 Test equipment for materials, components and structures
    - 1.9.2 Test equipment for functional and durability testing
    - 1.9.3 Test equipment for electronics
    - 1.9.4 Weighing devices
    - 1.9.5 Measuring devices
  - 1.10 Basis and construction elements**
    - 1.10.1 Levelling elements
    - 1.10.2 Profiles
    - 1.10.3 Connections
    - 1.10.4 Joints
    - 1.10.5 Surface elements
  - 1.11 Manual workplace systems**
    - 1.11.1 Manual handling manipulators
    - 1.11.2 Assembly cells
    - 1.11.3 Individual assembly work places
    - 1.11.4 Assembly tools
    - 1.11.5 Assembly assistance systems
  - 1.12 Workplace equipment**
    - 1.12.1 Assembly tables
    - 1.12.2 Work table accessories
    - 1.12.3 Supply of materials
    - 1.12.4 On-hand information
    - 1.12.5 Lights
    - 1.12.6 Chairs
  - 1.13 Packaging units**
  - 1.14 Surface Treatment**
    - 1.14.1 3D laser polishing and microstructuring
- 
- 2 Robotics**
    - 2.1 Industrial robots**
      - 2.1.1 Industrial robots, listed by type of construction**
        - 2.1.1.1 Linear robots, gantry robots
        - 2.1.1.2 Horizontally articulated robots (SCARA-robots)
        - 2.1.1.3 Vertically articulated robots
        - 2.1.1.4 Articulated robots
        - 2.1.1.5 Parallel link robots (e.g. linapods, tripods, hexapods)
        - 2.1.1.6 Industrial robots, special design
        - 2.1.1.7 Micro robots
      - 2.1.2 Components for robot systems**
        - 2.1.2.1 Jigs and fixtures
        - 2.1.2.2 Tool changing systems
        - 2.1.2.3 Robot measurement systems
        - 2.1.2.4 Peripherals for painting and coating
        - 2.1.2.5 Peripherals for dosing, gluing, application, coating and sealing
        - 2.1.2.6 Peripherals for spot welding
        - 2.1.2.7 Peripherals for arc welding
        - 2.1.2.8 Peripherals for processing applications
        - 2.1.2.9 Peripherals for cutting
        - 2.1.2.10 Peripherals for laser applications
        - 2.1.2.11 Peripherals for clean-rooms
      - 2.1.3 Industrial robots for specific fields of application**
        - 2.1.3.1 Industrial robots for painting and coating
        - 2.1.3.2 Industrial robots for sealing and gluing
        - 2.1.3.3 Industrial robots for spot welding
        - 2.1.3.4 Industrial robots for arc welding
        - 2.1.3.5 Industrial robots for processing
        - 2.1.3.6 Industrial robots for cutting
        - 2.1.3.7 Industrial robots for laser applications
        - 2.1.3.8 Industrial robots for assembling
        - 2.1.3.9 Industrial robots for measuring and testing
        - 2.1.3.10 Industrial robots for palettizing
        - 2.1.3.11 Industrial robots for pick & place and packaging
        - 2.1.3.12 Industrial robots for loading/unloading presses
        - 2.1.3.13 Industrial robots for loading/unloading die cast machines
        - 2.1.3.14 Industrial robots for loading/unloading injection moulding machines
      - 2.1.3.15 Industrial robots for loading/unloading machine tools
      - 2.1.3.16 Industrial robots for other material handling tasks
      - 2.1.3.17 Industrial robots for electrical engineering and electronics
      - 2.1.3.18 Industrial robots for food industry applications
      - 2.1.3.19 Industrial robots for clean-rooms
      - 2.1.3.20 Industrial robots for laboratories
      - 2.1.3.21 Industrial robots for micro technology applications
      - 2.1.3.22 Industrial robots for use in hostile environments
      - 2.1.3.23 Industrial robots for research and training
      - 2.1.3.24 Industrial robots for the production of photovoltaics
      - 2.1.3.25 Industrial robots for the production of composites
      - 2.1.3.26 Industrial robots for battery production
    - 2.1.4 Industrial robots for human-robot collaboration**
  - 2.2 Professional service robotics**
    - 2.2.1 Service Robots for professional use**
      - 2.2.1.1 Field robotics
      - 2.2.1.2 Cleaning robots
      - 2.2.1.3 Inspection systems
      - 2.2.1.4 Construction and demolition robots
      - 2.2.1.5 Logistic systems
      - 2.2.1.6 Medical robotics
      - 2.2.1.7 Service robots for safety, rescue and security applications
      - 2.2.1.8 Underwater systems
      - 2.2.1.9 Mobile platforms in general use
      - 2.2.1.10 Public relation robots
      - 2.2.1.11 Other service robots for professional use
      - 2.2.1.12 Humanoid robots
    - 2.2.2 Key technologies and components for service robotics**
      - 2.2.2.1 Perception
      - 2.2.2.2 Navigation
      - 2.2.2.3 Manipulation
      - 2.2.2.4 Human-machine interaction

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|---|--|--|
| <p><b>3 Machine vision</b></p> <p><b>3.1 Measuring systems for machine vision</b></p> <p><b>3.2 Components for machine vision</b></p> <p>3.2.1 Image capture hardware</p> <p>3.2.2 Optics and illuminations</p> <p>3.2.3 Image sensors</p> <p>3.2.4 Optical sensors</p> <p>3.2.5 Cameras</p> <p>3.2.6 High speed cameras</p> <p>3.2.7 Infra-red cameras</p> <p>3.2.8 Processors and computer components</p> <p>3.2.9 Intelligent cameras</p> <p>3.2.10 Vision sensors</p> <p>3.2.11 Software</p> <p><b>3.3 Machine vision systems for specific fields of application</b></p> <p>3.3.1 Measuring and comparing 2D and 3D</p> <p>3.3.2 Security systems</p> <p>3.3.3 Recognition of the shape and the position</p> <p>3.3.4 Identification systems and components</p> <p>3.3.5 Surface inspection and texture analysis</p> <p>3.3.6 X-ray inspection</p> <p>3.3.7 Completeness check</p> <p>3.3.8 Color inspection</p> <p>3.3.9 Quality inspection</p> <p>3.3.10 Optical code reading for 1D-codes/bar-codes and 2D-codes</p> <p>3.3.11 Optical character recognition (OCR)</p> <p><b>3.4 Embedded vision systems</b></p> <p><b>3.5 Augmented reality systems</b></p> <p><b>4 Positioning systems</b></p> <p><b>4.1 Modules</b></p> <p>4.1.1 Rotation modules, swivel units</p> <p>4.1.2 Linear modules</p> | <p><b>4.2 Grippers</b></p> <p>4.2.1 Grippers, electrical</p> <p>4.2.2 Grippers, pneumatic</p> <p>4.2.3 Grippers, hydraulic</p> <p>4.2.4 2-finger parallel grippers</p> <p>4.2.5 3-finger centric grippers</p> <p>4.2.6 Suction grippers</p> <p>4.2.7 Foil gripper systems</p> <p>4.2.8 Needle grippers</p> <p>4.2.9 Adhesion grippers</p> <p>4.2.10 Revolving grippers</p> <p>4.2.11 Micro-grippers</p> <p>4.2.12 Carbon grippers</p> <p><b>4.3 Clamping devices</b></p> <p>4.3.1 Clamping devices, manual</p> <p>4.3.2 Clamping devices, pneumatic</p> <p>4.3.3 Clamping devices, electrical</p> <p>4.3.4 Clamping devices, hydraulic</p> <p><b>4.4 Stop devices</b></p> <p>4.4.1 Stop devices, mechanical</p> <p>4.4.2 Stop devices, electrical</p> <p>4.4.3 Stop devices, pneumatic</p> <p>4.4.4 Stop devices, hydraulic</p> <p>4.4.5 Stop devices, magnetic</p> <p><b>4.5 Positioning systems, pneumatic</b></p> <p><b>4.6 Feed units, pneumatic</b></p> <p><b>4.7 Stroke feed units, pneumatic</b></p> <p><b>4.8 micro-positioning systems</b></p> <p><b>5 Drive technology</b></p> <p><b>5.1 Bearings</b></p> <p>5.1.1 Ball bearings</p> <p>5.1.2 Roller bearings</p> <p>5.1.3 Needle roller bearings</p> <p>5.1.4 Plain bearings</p> <p>5.1.5 Air bearings (radial)</p> <p>5.1.6 Magnetic bearings</p> <p><b>5.2 Linear guides</b></p> <p>5.2.1 Sliding guides</p> <p>5.2.2 Cam roller guides</p> <p>5.2.3 Linear ball bearing guides</p> <p>5.2.4 Profiled rail guides</p> <p>5.2.5 Cage rail guides</p> <p>5.2.6 Telescopic rail guides</p> <p>5.2.7 Air bearings (axial)</p> | <p><b>5.3 Linear motion drive elements and systems</b></p> <p>5.3.1 Acme screw drives</p> <p>5.3.2 Ball screw drives</p> <p>5.3.3 Roller screw drives</p> <p>5.3.4 Gear rack drives</p> <p>5.3.5 Toothed belt drives</p> <p>5.3.6 Linear motors</p> <p>5.3.7 Chain drives</p> <p>5.3.8 Accessories for linear motion drives elements</p> <p>5.3.9 Worm gear screw jacks</p> <p><b>5.4 Numeric controlled rotation axes</b></p> <p>5.4.1 Rotation axes, pneumatically driven</p> <p>5.4.2 Rotation axes, electric driven</p> <p>5.4.3 Rotation axes, electric driven with gear</p> <p>5.4.4 Rotation axes, electric driven without gear</p> <p><b>5.5 Numeric controlled linear axes</b></p> <p>5.5.1 Linear axes, pneumatic driven</p> <p>5.5.2 Linear axes, electric driven with toothed belt drives</p> <p>5.5.3 Linear axes, electric driven with leadscrew drives</p> <p>5.5.4 Linear axes, electric driven with gear rack drives</p> <p>5.5.5 Linear axes, electric driven with linear motors</p> <p><b>5.6 Gears</b></p> <p>5.6.1 Spur gear units</p> <p>5.6.2 Bevel gear units</p> <p>5.6.3 Worm gear units</p> <p>5.6.4 Planetary gear units</p> <p>5.6.5 Variable speed drives</p> <p>5.6.6 Precision gear units</p> <p><b>5.7 Industrial motors, motor controls, motor protection devices</b></p> <p>5.7.1 3-phase Motors</p> <p>5.7.2 Direct current motors</p> <p>5.7.3 Energy-saving motors</p> |
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## Product groups (Continuation)

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| 5.7.4      | Geared electric motors                           | <b>6.5</b>  | <b>Sensors for distance and thickness</b>                       | <b>7.5</b>  | <b>Freely programmable controls (FPCs)</b>                                |
| 5.7.5      | Servo drives                                     |             |   | <b>7.6</b>  | <b>Industrial PCs</b>   |
| 5.7.6      | Stepping motors                                  | 6.5.1       | Distance and thickness sensors, optical                         | <b>7.7</b>  | <b>BUS systems</b>  |
| 5.7.7      | Frequency converters                             | 6.5.2       | Distance and thickness sensors, inductive                       | <b>7.8</b>  | <b>Bus terminals</b>  |
| 5.7.8      | Servo-drive control units                        | 6.5.3       | Multi-layer measuring sensors                                   | <b>7.9</b>  | <b>Components for fieldbus systems</b>                                    |
| 5.7.9      | Motor protection devices                         | 6.5.4       | Distance and thickness sensors, ultrasonic                      | <b>7.10</b> | <b>Valve islands</b>  |
| 5.7.10     | Micro motors                                     | 6.5.5       | Distance and thickness sensors, capacitive                      | <b>7.11</b> | <b>Servo controller</b>   |
| <b>5.8</b> | <b>Special drives</b>                            | 6.5.6       | Distance and thickness sensors, magnetic                        | <b>7.12</b> | <b>CPU-cards</b>  |
| 5.8.1      | Pneumatic motors                                 | <b>6.6</b>  | <b>Force torque sensors</b>                                     | <b>7.13</b> | <b>Power supply units</b>   |
| 5.8.2      | Cylinders, electromechanical                     | <b>6.7</b>  | <b>Optoelectronic sensors</b>                                   | <b>7.14</b> | <b>Display and operating equipment</b>                                    |
| 5.8.3      | Cylinders, pneumatic                             | 6.7.1       | Throughbeam photoelectric sensors                               | <b>7.15</b> | <b>Electrical components for controls</b>                                 |
| 5.8.4      | Pressure transformers, pneumatic                 | 6.7.2       | Retro-reflective photoelectric sensors                          | <b>7.16</b> | <b>Industrial enclosures and control cabinets</b>                         |
| 5.8.5      | Air-oil actuators, pneumatic                     | 6.7.3       | Diffuse reflection light scanner                                | <b>7.17</b> | <b>Transmitting data via wireless or mobile communications</b>            |
| 5.8.6      | Lifting columns, electromechanical               | 6.7.4       | Diffuse reflection light scanner with background suppression    | <b>7.18</b> | <b>Optical data transmission</b>  |
| 5.8.7      | Lifting elements, electromechanical              | 6.7.5       | Fiber sensors   | <b>7.19</b> | <b>Wireless data transmission</b>   |
| 5.8.8      | Chain guides, electromechanical                  | 6.7.6       | Mark sensors  | <b>7.20</b> | <b>Remote maintenance and diagnostic systems</b>                          |
| 5.8.9      | Linear lifting magnets                           | 6.7.7       | Color sensors   | <b>7.21</b> | <b>Machine-to-machine communications (M2M)</b>                            |
| 5.8.10     | Linear interlocking magnets                      | 6.7.8       | Luminescence scanner  | <b>7.22</b> | <b>Human-machine interfaces (HMI)</b>                                     |
| 5.8.11     | Swing drives, electromechanical                  | 6.7.9       | Photoelectric fork sensors                                      | <b>7.23</b> | <b>Virtual reality systems for industrial applications</b>                |
| 5.8.12     | Accessories for electromechanical actuators      | 6.7.10      | Light-grills  |             |   |
| <b>5.9</b> | <b>Multiple systems</b>                          | 6.7.11      | Optical windows   | <b>8</b>    | <b>Safety and security technology</b>                                     |
| <b>6</b>   | <b>Sensor technology</b>                         | <b>6.8</b>  | <b>Ultrasonic sensors</b>                                       | <b>8.1</b>  | <b>Mechanical and electro-mechanical safety devices</b>                   |
| <b>6.1</b> | <b>Proximity switches</b>                        | 6.8.1       | Ultrasonic through beam barrier                                 | 8.1.1       | Guards  |
| 6.1.1      | Proximity switches, inductive                    | 6.8.2       | Ultrasonic reflection barrier                                   | 8.1.2       | Doors and gates   |
| 6.1.2      | Proximity switches, capacitive                   | 6.8.3       | Ultrasonic sensors  | 8.1.3       | Anti-collision systems  |
| 6.1.3      | Cylinder position switches                       | <b>6.9</b>  | <b>Identification sensors (RFID)</b>                            | 8.1.4       | Overload protection equipment   |
| <b>6.2</b> | <b>Rotary encoders</b>                           | <b>6.10</b> | <b>Micro-sensors</b>  | 8.1.5       | Shock absorbers   |
| 6.2.1      | Rotary encoders, absolute                        | <b>6.11</b> | <b>Pneumatic measuring apparatus</b>                            | 8.1.6       | Bellows   |
| 6.2.2      | Rotary encoders, incremental                     | <b>6.12</b> | <b>Pressure switches, pneumatic</b>                             | <b>8.2</b>  | <b>Safety-related control systems</b>                                     |
| <b>6.3</b> | <b>Mechanical limit switches</b>                 | <b>6.14</b> | <b>Accessories</b>  | <b>8.3</b>  | <b>Safety-related sensor technology</b>                                   |
| 6.3.1      | Single limit switches                            | <b>7</b>    | <b>Control systems technology and industrial communications</b> | <b>8.4</b>  | <b>Safety-related communications technology</b>                           |
| 6.3.2      | Multiple limit switches                          |             |   | <b>8.5</b>  | <b>Safety-related drive systems</b>                                       |
| <b>6.4</b> | <b>Linear displacement transducers</b>           | <b>7.1</b>  | <b>Controls, electronic</b>                                     | <b>8.6</b>  | <b>Security-related hardware for the networked factory</b>                |
| 6.4.1      | Optical linear displacement transducers          | <b>7.2</b>  | <b>Controls, mechanical (cam-controlled)</b>                    | <b>8.7</b>  | <b>Software solutions for security management and security monitoring</b> |
| 6.4.2      | Inductive linear displacement transducers        | <b>7.3</b>  | <b>Controls, pneumatic</b>                                      | <b>8.8</b>  | <b>IT security and monitoring services</b>                                |
| 6.4.3      | Magnetostrictive linear displacement transducers | <b>7.4</b>  | <b>CNC-control systems</b>                                      |             |   |
| 6.4.4      | Potentiometric linear displacement transducers   |             |   |             |   |
| 6.4.5      | Magnetic linear displacement transducers         |             |   |             |   |
| 6.4.6      | LVDT   |             |   |             |   |



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| <b>9</b>    | <b>Supply technology</b>  | 10.1.5      | Communications and network software   | <b>10.7</b> | <b>System integration and consulting for cloud computing and big data</b> |
| 9.1         | <b>Cable and hose carrier systems</b>                               | 10.1.6      | Software for field bus systems  |             |   |
| 9.2         | <b>Cable protection systems</b>                                     | 10.1.7      | Software for process control systems  | <b>11</b>   | <b>Services and service providers</b>                                     |
| 9.3         | <b>Cable and tube bushings</b>                                      | 10.1.8      | Software for remote diagnosis   |             |   |
| 9.4         | <b>Electrical power supply</b>                                      | 10.1.9      | Programming tools   | <b>11.1</b> | <b>Services</b>   |
| 9.4.1       | Wiring systems, complete  | 10.1.10     | Software for quality inspection and documentation   | 11.1.1      | General contractors, system integrators                                   |
| 9.4.2       | Cable and wires   | <b>10.2</b> | <b>Software for machine vision</b>  | 11.1.2      | Engineering, consultancy, planning  |
| 9.4.3       | Cord sets   | 10.2.1      | Machine vision software, general  | 11.1.3      | Feasibility studies   |
| 9.4.4       | Cable clips   | 10.2.2      | Software tools  | 11.1.4      | Simulations   |
| 9.4.5       | Connectors  | 10.2.3      | Fuzzy logic software  | 11.1.5      | CAD/CAM services  |
| 9.4.6       | Connection material, without soldering                              | <b>10.3</b> | <b>Software and systems for the smart factory</b>   | 11.1.6      | Optimisation of existing systems  |
| <b>9.5</b>  | <b>Compressed air supply</b>  | 10.3.1      | Procurement, merchandise management, logistics and supply-chain management (SCM)                                | 11.1.7      | Integration in new/existing IT-environments                               |
| 9.5.1       | Maintenance units for compressed air                                | 10.3.2      | Enterprise resource planning (ERP) and manufacturing resource planning (MRP)                                    | 11.1.8      | Programming   |
| 9.5.2       | Filters for compressed air  | 10.3.3      | Maintenance and repair  | 11.1.9      | Robot calibrations  |
| 9.5.3       | Pressure regulators   | 10.3.4      | Product lifecycle management (PLM)  | 11.1.10     | Trainings   |
| 9.5.4       | Lubrications for compressed air                                     | 10.3.5      | Production data acquisition (PDA), production data management (PDM), manufacturing execution (MES)              | 11.1.11     | Condition monitoring  |
| 9.5.5       | Compressed air dryer  | 10.3.6      | Advanced planning and scheduling (APS), process simulation and optimization and automated process control (APC) | 11.1.12     | Predictive maintenance  |
| 9.5.6       | Tube lines for compressed air                                       | 10.3.7      | Operating systems and extensions for the smart factory  | 11.1.13     | Retrofit  |
| 9.5.7       | Hose lines for compressed air                                       | <b>10.4</b> | <b>Smart-factory services</b>   | 11.1.14     | Mechanical, electrical services, etc.                                     |
| 9.5.8       | Screwed connections and connections for compressed air              | 10.4.1      | System development and integration  | 11.1.15     | Certifications, safety inspections  |
| 9.5.9       | Silencers for compressed air  | 10.4.2      | Developing apps, smart-factory software and systems   | 11.1.16     | Services for research and innovation                                      |
| 9.5.10      | Sealing devices for compressed air                                  | 10.4.4      | IT services and outsourcing   | 11.1.17     | Construction of special purpose machinery                                 |
| 9.5.11      | Accessories for compressed air                                      | <b>10.5</b> | <b>Cloud computing</b>  | <b>11.2</b> | <b>Service providers</b>  |
| <b>9.6</b>  | <b>Ventilation technology and extraction systems</b>                | 10.5.1      | Cloud-based infrastructure services (IaaS)  | 11.2.1      | Management consultancies  |
| <b>9.7</b>  | <b>Components for ventilation technology and extraction systems</b> | 10.5.2      | Cloud-based platform services (PaaS)  | 11.2.2      | Banks and financial institutions  |
| <b>9.8</b>  | <b>Vacuum technology</b>  | 10.5.3      | Cloud-based software services (SaaS)  | 11.2.3      | Insurance institutions  |
| <b>9.9</b>  | <b>Hydraulic supply</b>   | <b>10.6</b> | <b>Systems and solutions for Big-data applications</b>  | 11.2.4      | Trade associations and organizations                                      |
| <b>10</b>   | <b>Software and cloud computing</b>                                 | 10.6.1      | Big-data platforms  | 11.2.5      | Standards committees  |
| <b>10.1</b> | <b>Software for robotics, assembly and handling technology</b>      | 10.6.2      | Big-data software and analytics   | 11.2.6      | Official agencies and authorities   |
| 10.1.1      | Software for simulation   |             |   | 11.2.7      | Universities and universities of applied sciences                         |
| 10.1.2      | Software for robots and plant control systems                       |             |   | 11.2.8      | Training institutions   |
| 10.1.3      | Software for process-controlled programming and visualisation       |             |   | 11.2.9      | Publishers and publications   |
| 10.1.4      | Software for numerical control systems                              |             |   |             |   |

## Product groups (Continuation)

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- 12 Research and technology**
- 12.1 Research in the field of industrial automation
- 12.2 Research in the field of industrial robotics
- 12.3 Research in the field of service robotics
- 12.4 Research in the field of machine and plant construction
- 12.5 Research in the field of transport and traffic
- 12.6 Research in the field of electrical engineering
- 12.7 Research in the field of information transmission and communications
- 12.8 Research in the field of micro technologies
- 12.9 Research in the field of nanotechnology
- 12.10 Research in the field of optical technologies
- 12.11 Research in the field of medical technology
- 12.12 Energy and environmental research
- 12.13 Material research
- 12.14 Physics research
- 12.15 Composites technology
- 12.16 Battery technology

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