

Lexium™ SCARA

Hardware Guide

Original instructions

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The information provided in this document contains general descriptions, technical characteristics and/or recommendations related to products/solutions.

This document is not intended as a substitute for a detailed study or operational and site-specific development or schematic plan. It is not to be used for determining suitability or reliability of the products/solutions for specific user applications. It is the duty of any such user to perform or have any professional expert of its choice (integrator, specifier or the like) perform the appropriate and comprehensive risk analysis, evaluation and testing of the products/solutions with respect to the relevant specific application or use thereof.

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Safety Information

Important Information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Please Note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

About the Book

Document Scope

This manual is to help you use the capabilities of the Lexium SCARA safely and properly.

Follow the instructions within this manual to help:

- Reduce risks
- Reduce repair costs and downtime of the Lexium SCARA
- Increase the service life of the Lexium SCARA
- Increase the reliability of the Lexium SCARA

Validity Note

This document has been updated for the release of EcoStruxure™ Machine Expert V2.2.2.

The characteristics of the products described in this document are intended to match the characteristics that are available on www.se.com. As part of our corporate strategy for constant improvement, we may revise the content over time to enhance clarity and accuracy. If you see a difference between the characteristics in this document and the characteristics on www.se.com, consider www.se.com to contain the latest information.

For product compliance and environmental information (RoHS, REACH, PEP, EOL, etc.), go to www.se.com/ww/en/work/support/green-premium/.

Available Languages of this Document

This document is available in these languages:

- English (EIO0000005360)

Related Documents

Title of Documentation	Reference Number
Lexium SCARA Instruction Sheet	BRU12497
Robotic Library Guide (only available in the online help)	EIO0000002232 (EN)
RoboticModule Library Guide (only available in the online help)	EIO0000002234 (EN)
SchneiderElectricRobotics Library Guide (only available in the online help)	EIO0000002236 (EN)
Device Assistant User Guide	EIO0000002291 (EN)
Cybersecurity Guidelines for EcoStruxure Machine Expert, Modicon and PacDrive Controllers and Associated Equipment, User Guide	EIO0000004242 (EN)
Cybersecurity Best Practices	7EN52-0390 (EN)

To find documents online, visit the Schneider Electric download center (www.se.com/ww/en/download/).

Trademarks

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Product Related Information

The equipment described herein must be used in accordance with the application-specific risk analysis that you are to perform along with verification of all applicable standards. Pay attention in conforming to any safety information, different electrical requirements, and normative standards that would apply to your application of the information contained in the present manual and the manuals for associated equipment.

DANGER

ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires except under the specific conditions specified in the appropriate hardware guide for this equipment.
- Always use a properly rated voltage sensing device to confirm that the power is off where and when indicated.
- Replace and secure all covers, accessories, hardware, cables, and wires and confirm that a proper ground connection exists before applying power to the equipment.
- Use only the specified voltage when operating this equipment and any associated products.
- After switching off the equipment make sure to maintain a waiting time of at least 5 minutes before disconnecting the power cable for the capacitors to discharge.
- Operate electrical components only with a connected protective ground (earth) cable.
- Verify the secure connection of the protective ground (earth) cable to the electrical devices so that connection complies with the wiring diagram.
- Do not touch the electrical connection points of the components when the equipment is energized.
- Provide protection against indirect contact.
- Insulate any unused conductors on both ends of the connection cable.
- Ensure that the power cables are correctly connected and connectors are locked in place during the operation time of the system.

Failure to follow these instructions will result in death or serious injury.

⚠ WARNING**UNINTENDED EQUIPMENT OPERATION**

- Perform a hazard and risk analysis to determine the appropriate safety integrity level, and any other safety requirements, for your specific application based on all the applicable standards.
- Ensure that the hazard and risk analysis is conducted and respected according to EN/ISO 12100 during the design of your machine.
- Apply all measures from the hazard and risk analysis before putting the system in service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING**LOSS OF CONTROL**

- Perform a Failure Mode and Effects Analysis (FMEA), or equivalent risk analysis, of your application, and apply preventive and detective controls before implementation.
- Provide a fallback state for undesired control events or sequences.
- Provide separate or redundant control paths wherever required.
- Supply appropriate parameters, particularly for limits.
- Review the implications of transmission delays and take actions to mitigate them.
- Review the implications of communication link interruptions and take actions to mitigate them.
- Provide independent paths for control functions (for example, emergency stop, over-limit conditions, and error conditions) according to your risk assessment, and applicable codes and regulations.
- Apply local accident prevention and safety regulations and guidelines.¹
- Test each implementation of a system for proper operation before placing it into service.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

¹ For additional information, refer to NEMA ICS 1.1 (latest edition), *Safety Guidelines for the Application, Installation, and Maintenance of Solid State Control* and to NEMA ICS 7.1 (latest edition), *Safety Standards for Construction and Guide for Selection, Installation and Operation of Adjustable-Speed Drive Systems* or their equivalent governing your particular location.

⚠ WARNING**UNINTENDED EQUIPMENT OPERATION**

- Only use software, firmware and hardware components approved by Schneider Electric for use with this equipment.
- Update your application program every time you change the physical hardware configuration.
- Validate and test your system every time you apply safety-related or non-safety-related modifications to your application program or modify the physical hardware configuration.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Install and operate the device only in the intended environment considering the residual risks.
- Do not disassemble, repair, or modify this equipment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Information on Non-Inclusive or Insensitive Terminology

As a responsible, inclusive company, Schneider Electric is constantly updating its communications and products that contain non-inclusive or insensitive terminology. However, despite these efforts, our content may still contain terms that are deemed inappropriate by some customers.

Terminology Derived from Standards

The technical terms, terminology, symbols and the corresponding descriptions in the information contained herein, or that appear in or on the products themselves, are generally derived from the terms or definitions of international standards.

In the area of functional safety systems, drives and general automation, this may include, but is not limited to, terms such as *safety*, *safety function*, *safe state*, *fault*, *fault reset*, *malfunction*, *failure*, *error*, *error message*, *dangerous*, etc.

Among others, these standards include:

Standard	Description
IEC 61131-2:2007	Programmable controllers, part 2: Equipment requirements and tests.
ISO 13849-1:2023	Safety of machinery: Safety related parts of control systems. General principles for design.
EN 61496-1:2020	Safety of machinery: Electro-sensitive protective equipment. Part 1: General requirements and tests.
ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN 60204-1:2006	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ISO 14119:2013	Safety of machinery - Interlocking devices associated with guards - Principles for design and selection
ISO 13850:2015	Safety of machinery - Emergency stop - Principles for design
IEC 62061:2021	Safety of machinery - Functional safety of safety-related electrical, electronic, and electronic programmable control systems
IEC 61508-1:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems: General requirements.
IEC 61508-2:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems: Requirements for electrical/electronic/programmable electronic safety-related systems.
IEC 61508-3:2010	Functional safety of electrical/electronic/programmable electronic safety-related systems: Software requirements.
IEC 61784-3:2021	Industrial communication networks - Profiles - Part 3: Functional safety fieldbuses - General rules and profile definitions.
2006/42/EC	Machinery Directive

Standard	Description
2014/30/EU	Electromagnetic Compatibility Directive
2014/35/EU	Low Voltage Directive

In addition, terms used in the present document may tangentially be used as they are derived from other standards such as:

Standard	Description
IEC 60034 series	Rotating electrical machines
IEC 61800 series	Adjustable speed electrical power drive systems
IEC 61158 series	Digital data communications for measurement and control – Fieldbus for use in industrial control systems

Finally, the term *zone of operation* may be used in conjunction with the description of specific hazards, and is defined as it is for a *hazard zone* or *danger zone* in the *Machinery Directive (2006/42/EC)* and *ISO 12100:2010*.

NOTE: The aforementioned standards may or may not apply to the specific products cited in the present documentation. For more information concerning the individual standards applicable to the products described herein, see the characteristics tables for those product references.

Figures

Unless otherwise stated, the different types and variants of the Lexium SCARA are represented in the figures by the type LXMRSP06•••••.

Dual Dimensions

Dimensions are indicated in metric system and U.S. customary units system. The U.S. dimensions are given in parentheses, for example 8.4 mm (0.33 in).

NOTE: The values in parentheses are rounded and are for reference only.

Hazard Information

Proper Use

Overview

This section contains information regarding the operation of the Lexium SCARA. Qualified personnel, page 14, working with the Lexium SCARA, must read and observe this information.

Installation and Intended Use

The Lexium SCARA (Selective Compliance Assembly Robot Arm) is a partly completed machinery intended to be integrated into a machine or assembled with other components to form a machine or system. The Lexium SCARA is an open type robot that is intended to be installed into an enclosure to provide access protection.

The Lexium SCARA is fast moving equipment. You must ensure that the personnel programming, operating, maintaining, or repairing the robot or machine has undergone all necessary training and is able to demonstrate the competence required to carry out these tasks.

⚠ WARNING

MOVING PARTS OF THE ROBOT

- Comply with the specified operating conditions and all safety standards concerning robot-based applications.
- Inform operators of the hazards involved in robot-based applications.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Provide for Protective Measures

Before installing the Lexium SCARA, provide appropriate protective devices in compliance with local and national standards. Do not commission components without appropriate protective devices. After installation, commissioning, or repair, test the protective devices used.

Other standards are applicable as guideline for a Lexium SCARA integration into the machine such as (non exhaustive list):

- Directive 2006/42/EC on machinery
- Directive EMC 2014/30/EU
- Standard ISO 10218-1 Robots and Robotic devices - Safety requirements for industrial Robots - Part 1: Robots
- Standard ISO 10218-2 Robots and Robotic devices - Safety requirements for industrial Robots - Part 2: Robot systems and integration
- Standard ISO 13849-1 Safety of machinery - Safety related parts of control systems - Part 1: General Principles for Design
- Standard ISO 13857 Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs
- Standard ISO 14120 Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards

- Standard EN ISO 13854 Safety of machinery - Minimum gaps to avoid crushing of parts of the human body
- Standard ISO 13855 Safety of machinery - Positioning of safeguards with respect to the approach speeds of parts of the human body
- Standard NFPA 79 Electrical Standard for Industrial Machinery
- Standard NFPA 70 National Electric Code
- Standard UL 1740 Standard for Robots and Robotic Equipment
- Standard UL 2011 Standard for Factory Automation Equipment

Perform a risk evaluation concerning the specific use before operating the Lexium SCARA and take appropriate security measures.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Use appropriate protective devices (functional safety devices) in compliance with local and national standards.
- Perform a hazard and risk analysis to determine the appropriate safety integrity level, and any other safety requirements, for your specific application based on all the applicable standards.
- Ensure that a risk assessment is conducted and respected according to EN/ISO 12100 during the design of your machine.
- Apply all measures from the hazard and risk analysis before putting the system in operation for the first time.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

If circumstances arise that affect the safety or cause changes to the operating behavior of the Lexium SCARA, then immediately shut down the Lexium SCARA and contact your local Schneider Electric service representative.

Use Original Equipment Only

Use only the accessories and mounting parts specified in the documentation and only third-party devices or components that have been expressly approved by Schneider Electric. Only modify the Lexium SCARA in the manner intended and described in this documentation, and other documentation concerning any other associated equipment.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Only use software, firmware and hardware components approved by Schneider Electric for use with this equipment.
- Update your application program every time you change the physical hardware configuration.
- Validate and test your system every time you apply safety-related or non-safety-related modifications to your application program or modify the physical hardware configuration.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Misuse

The Lexium SCARA is not suitable for the manipulation of living organisms or explosive materials, nor is it suitable for impact movement.

Incompatible Environments

The components must not be used in the following environments:

- Hazardous (explosive) atmospheres
- Floating systems
- Medical, life critical or life support systems
- Domestic appliances
- Underground
- Highly saline environments (refer to Technical Data, page 30 for materials used)
- Environments with increased radioactive radiation
- Vacuum environments

This equipment has been designed to operate outside of any hazardous location. Only install this equipment in zones known to be free of a hazardous atmosphere.

DANGER

POTENTIAL FOR EXPLOSION

Install and use this equipment in non-hazardous locations only.

Failure to follow these instructions will result in death or serious injury.

Installation and Operating Conditions

The operating conditions at the installation location must be inspected and maintained in accordance with the required technical data (performance data and ambient conditions). Commissioning is prohibited until the usable machine or process in which the Lexium SCARA is installed is in accordance to the applicable local regulations and standards.

WARNING

UNINTENDED EQUIPMENT OPERATION

Only use the components in accordance with the installation conditions described in this documentation and other supporting documentation and standards.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Qualification of Personnel

Target Audience for This Manual

This documentation is intended for users having the following knowledge:

- Advanced knowledge in mechanical engineering
- Advanced knowledge in electrical engineering
- Knowledge of the design of the machine/process in which it is intended

Qualified Person

Aside from skills and knowledge, qualified personnel must be able to detect possible hazards that may arise from parametrization, changing parameter values and generally from mechanical, electrical, or electronic equipment. The qualified personnel must be familiar with the standards, provisions, and regulations for the prevention of industrial accidents, which they must observe when working on the Lexium SCARA system.

Residual Risks

Overview

Risks arising from the robot have been reduced. However a residual risk remains since the robot is moved and operated with electrical voltage and electrical currents.

If activities involve residual risks, a safety message is made at the appropriate points. This includes potential hazards that may arise, their possible consequences, and describes preventive measures to avoid the hazards.

Electrical Parts

DANGER

ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires except under the specific conditions specified in the appropriate hardware guide for this equipment.
- Always use a properly rated voltage sensing device to confirm that the power is off where and when indicated.
- Replace and secure all covers, accessories, hardware, cables, and wires and confirm that a proper ground connection exists before applying power to the equipment.
- Use only the specified voltage when operating this equipment and any associated products.
- After switching off the equipment make sure to maintain a waiting time of at least 5 minutes before disconnecting the power cable for the capacitors to discharge.
- Operate electrical components only with a connected protective ground (earth) cable.
- Verify the secure connection of the protective ground (earth) cable to the electrical devices so that connection complies with the wiring diagram.
- Do not touch the electrical connection points of the components when the equipment is energized.
- Provide protection against indirect contact.
- Insulate any unused conductors on both ends of the connection cable.
- Ensure that the power cables are correctly connected and connectors are locked in place during the operation time of the system.

Failure to follow these instructions will result in death or serious injury.

NOTE: The following standardized "dangerous voltage" alert symbol is attached to the Lexium SCARA.



Emergency Stop

The Lexium SCARA is equipped with internal holding brakes on joint 3 and joint 4. The Lexium SCARA is not equipped with other brakes.

The holding brakes automatically engage when a safety stop or emergency stop is performed. For more information on connecting the Lexium SCARA robot to external safety devices, refer to [Electrical Connections](#), page 41.

⚠ WARNING

ENTRAPMENT BY ROBOT MECHANICS

- Provide means for ensuring that the motors can be put into a voltage-free state with any internal holding brake released.
- Make available those means to allow one person to manually move the robot within reach of the zone of operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Assembly and Handling

⚠ WARNING

CRUSHING, SHEARING, CUTTING AND HITTING DURING HANDLING

- Observe the general construction and safety regulations for handling and assembly.
- Use appropriate mounting and transport equipment and use appropriate tools.
- Prevent clamping and crushing by taking appropriate precautions.
- Cover edges and angles to protect against cutting damage.
- Wear suitable protective clothing (for example, protective goggles, protective boots, protective gloves).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: The following hand pinching alert symbol is attached to the Lexium SCARA.



Installation

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Ensure that the Lexium SCARA and the end-effector are properly attached to one another.
- Verify that the settings are correct for the Lexium SCARA installation position, the payload mounted on the Tool Center Point (TCP), and the TCP offset according to the instructions in the present document and any supporting documents.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Robot Motion

Parts of the mechanics can move at high speeds. In such cases, the payload weight, additionally installed end-effector, and shifts in the center of gravity of the moving parts contribute to the total energy of the forces generated.

Joint 3 and joint 4 of the Lexium SCARA have an internal holding brake. In case of power loss, the brake engages automatically to help prevent the Lexium SCARA from moving.

NOTE: Moving joints 3 and/or 4 with the holding brake(s) engaged may damage the holding brake. Avoid such movement in non-emergency conditions.

The functional safety standards and directives for the respective country where the equipment is in use define which protective measures are appropriate. Additionally, the system engineer who is responsible for the integration of the robot mechanics must evaluate which measures have to be taken.

NOTE: The configuration of the robot mechanics, the Tool Center Point (TCP) velocity, as well as the additional payload have an effect on the total energy, which can potentially be a source of damage and injury.

⚠ WARNING

CRUSHING, SHEARING, CUTTING AND IMPACT INJURY

- Define the clearance distance to the working area of operation of the Lexium SCARA to be within the mechanical limits such that the operational staff do not have access to, nor can be enclosed between, the Lexium SCARA working area and the mechanical limits of operation.
- All barriers, protective doors, contact mats, light barriers, visual protection system, and other protective equipment must be connected, configured correctly and enabled whenever the robot mechanics are under power.
- Consider the Lexium SCARA as active even though the Lexium SCARA has reached a stop position waiting for a run command.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠ WARNING

INAPPROPRIATE SAFETY FUNCTIONS

- Ensure that each safety function is verified by parameters and procedure before putting the system in operation for the first time.
- Ensure that your intended combination of safety functions is available when using the Lexium SCARA.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTICE**INSUFFICIENT WORKING SPACE**

Ensure the Lexium SCARA has sufficient space to operate freely.

Failure to follow these instructions can result in equipment damage.

NOTE: The following impact hazard and hand pinching alert symbols are attached to Lexium SCARA.



Heat Dissipation

The Lexium SCARA surface and the housing of the Lexium SCARA are parts of the heat dissipation concept of the system. For this reason, the surfaces must be kept clean and free of any coating or paint.

NOTICE**INOPERABLE EQUIPMENT**

- Keep the surface and housing clean.
- Do not apply coating or painting to the surface and housing nor anything that would affect the heat dissipation properties of the Lexium SCARA.

Failure to follow these instructions can result in equipment damage.

Hot Surfaces

The temperature on the housing of the Lexium SCARA may exceed 50 °C (122 °F).

▲ WARNING**HOT SURFACES**

- Avoid unprotected contact with hot surfaces.
- Do not allow flammable or heat-sensitive parts in the immediate vicinity of hot surfaces.
- Verify that the heat dissipation is sufficient by performing a test run under maximum load conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: The following hot surface alert symbol is attached to the Lexium SCARA.



Hazardous Movements

There can be different sources of hazardous movements:

- No or incorrect calibration of the Lexium SCARA
- Wiring or cabling errors
- Errors in the application program
- Component errors
- Error in the measured value and signal transmitter
- Incorrect installation settings (for example, payload parameter, TCP offset, safety-related configuration)
- Combination of the Lexium SCARA with other equipment or integration into a machine or process

NOTE: Provide for personal safety by primary equipment monitoring or measures. Do not rely only on the internal monitoring of the Lexium SCARA system. Adapt the monitoring or other arrangements and measures to the specific conditions of the installation in accordance with a hazard and risk analysis.

⚠ DANGER

UNAVAILABLE OR INADEQUATE PROTECTION DEVICE(S)

- Prevent entry to the zone of operation with, for example, protective fencing, mesh guards, protective coverings, light barriers or visual protection systems.
- Dimension the protective devices properly and do not remove or modify them.
- Connect safety-related devices only to the dedicated safety-related inputs and outputs of the system.
- Do not make any modifications that can degrade, incapacitate, or in any way invalidate protection devices.
- Protect existing workstations and operating terminals against unauthorized operation.
- Position emergency stop switches so that they are accessible and within reach of the normal position or station of the operator of the equipment.
- Validate the functionality of emergency stop equipment before start-up and during maintenance periods.
- Prevent unintentional start-up by disabling the power stages of the equipment system using the emergency stop circuit or using an appropriate lock-out tag-out sequence.
- Validate the system and installation before the initial start-up.
- Avoid operating high-frequency, remote control, and radio devices close to the system electronics and their feed lines.
- Perform, if necessary, a special electromagnetic compatibility (EMC) verification of the system.

Failure to follow these instructions will result in death or serious injury.

The Lexium SCARA may perform unanticipated movements because of incorrect wiring, incorrect settings, incorrect data, or other errors.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Carefully install the wiring in accordance with EMC standards.
- Do not operate the Lexium SCARA with undetermined settings and data.
- Perform comprehensive commissioning tests that include verification of configuration settings and data that determine position and movement.
- Do not operate the Lexium SCARA with a payload greater than the maximum payload.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

For further information on the payload, refer to *Technical Data*, page 30.

Noise Protection

The noise level of the mechanics depends on the basic cycle and the payload, as well as on further application-specific accessory parts. Be aware of the fact that noise emissions multiply when several mechanics are in use at the same time. If noise emissions reach a value of more than 70 dBA, wear hearing protection.

⚠ CAUTION

NOISE EMISSIONS OF THE ROBOT MECHANICS

- Wear hearing protection in accordance with the locally applicable regulations.
- Ensure that operators are clearly warned of any potentially excessive noise emissions.

Failure to follow these instructions can result in injury or equipment damage.

NOTE: Attach an alert symbol, such as depicted here, where it can easily be seen in the area where the Lexium SCARA is installed.



Emissions

Lubricant emissions on the Lexium SCARA may be an indication of a damaged joint.

NOTICE

INOPERABLE EQUIPMENT INDICATED BY LUBRICANT EMISSIONS

- Verify the mechanics before, during, and after use.
- Shut down the mechanics immediately if lubricant emissions appear on the Lexium SCARA.

Failure to follow these instructions can result in equipment damage.

Hanging Loads

The Lexium SCARA is capable of suspending heavy loads.

⚠ WARNING

FALLING LOADS

- Do not stand under hanging loads.
- Ensure that the Lexium SCARA is properly bolted on the mounting surface.
- Ensure that the permissible payload is properly bolted on the Lexium SCARA tool flange.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Attachments or Modifications

Various end effectors can be mounted on the tool flange of the Lexium SCARA. Ensure that the motion of the Lexium SCARA is not restricted by the end effector itself or by pneumatic hoses or wires used to operate the end effector.

If different customer end products are transported by the robot mechanics, then the product pickup must be modified accordingly. For this reason, you can mount different product pickups (end-effector mounting) to the flange. In doing so, ensure that the articulation movement is not restricted and/or that no motion errors can result from the modifications. Attachments and rebuilds must not influence the operation of the protective devices in any way and all emergency stop buttons must be accessible and operational at all times.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Do not drill into or modify the equipment.
- Do not modify the cable set.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Moving the Robot Without Drive Energy

The robot mechanics are not equipped with an enclosure.

NOTE: Take appropriate safety-related measures concerning the specific use before operating the Lexium SCARA.

⚠ WARNING

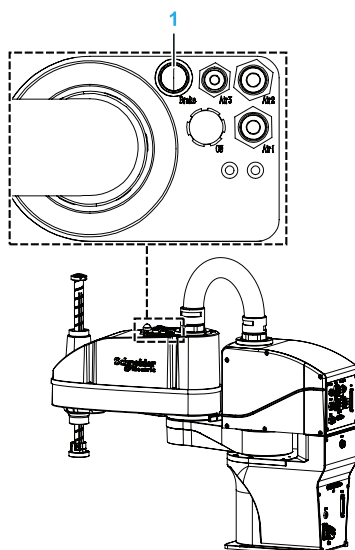
SAGGING OF THE LEXIUM SCARA

- Ensure that the robot is in the defined safe state before entering the zone of operation.
- Ensure that the release of the internal holding brakes poses no subsequent risks in the zone of operation.
- Ensure that the emergency stop or the protective stop is enabled.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

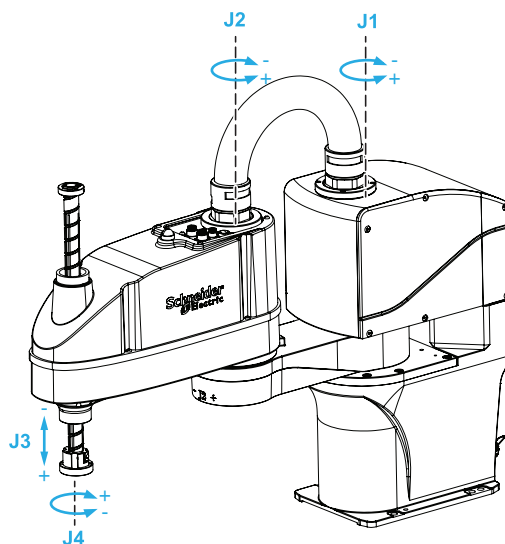
Once the robot is in the defined safe state, the axes J1 and J2 can be moved manually by pushing the robot arms. Axis J3 and J4 are held by a holding brake and do not move freely.

When the robot is powered, press and hold the brake release button to release the brakes. J3 and J4 can then be moved manually. Depending on the load, the axis may move when the brakes are released.



1 Brake release push-button

When the robot is not powered, axes J3 and J4 can be forced to move without releasing the brakes. Significantly higher forces/torques are required to move the axis in this case.



For detailed information, refer to the technical specification of the **Mechanical and Electrical Data**, page 32.

System Overview

System Architecture

Overview



NOTE: To help keep your Schneider Electric products secure and protected, refer to the *Cybersecurity Best Practices* and *Cybersecurity Guidelines* provided on the Schneider Electric website. See *Related Documents*, page 6.

Product Overview

Scope of Delivery

A Lexium SCARA package contains the following items:

- Lexium SCARA
- Set of cables for IP20 including:
 - 1x **Cable_POWER**, 5 m (16.4 ft)
 - 1x **Cable_Base CS**, 5 m (16.4 ft)
 - 1x **Cable_Arm CS**, 1.5 m (4.9 ft)
 - 1x **Cable_SAFETY**, 5 m (16.4 ft)
 - 1x **Cable_I/O**, 5 m (16.4 ft)
 - 1x MCP jumper plug
 - 18x fully insulated blade connectors, red (for cable arm wiring)
 - 1x set of fastening hardware including:
 - 4x hexagon socket screws M8x25
 - 4x spring washers
 - 4x flat washers
- Instruction sheet
- Declaration of conformity

After unpacking, verify the contents of the carton using the packing list and inspect the equipment for transport damage.

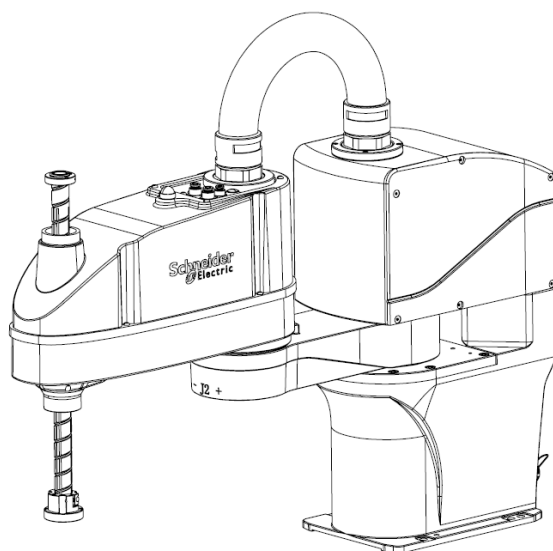
NOTE: In case of transport damages, contact your local Schneider Electric service representative.

General Description of the Lexium SCARA

The Lexium SCARA is designed as a compact, embeddable system. Typically, this type of robot is used in material handling and parts loading/unloading in electronics, food, and packaging industries.

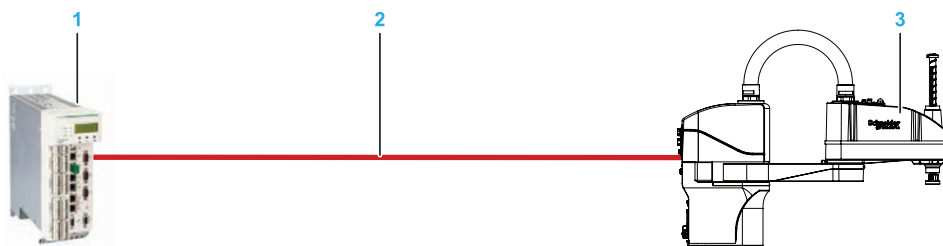
The Lexium SCARA has the following characteristics:

- Available with a workspace of 500 mm (19.7 in), 600 mm (23.6 in), or 700 mm (27.6 in), and two-stroke lengths of 200 mm (7.9 in) or 300 mm (11.8 in), for adaptation to different user applications.
- The robot is IP20 rated.



System Setup

The following figure presents an example of a system setup for a Lexium SCARA. At a minimum, the following equipment is required to achieve the performance described in this guide.



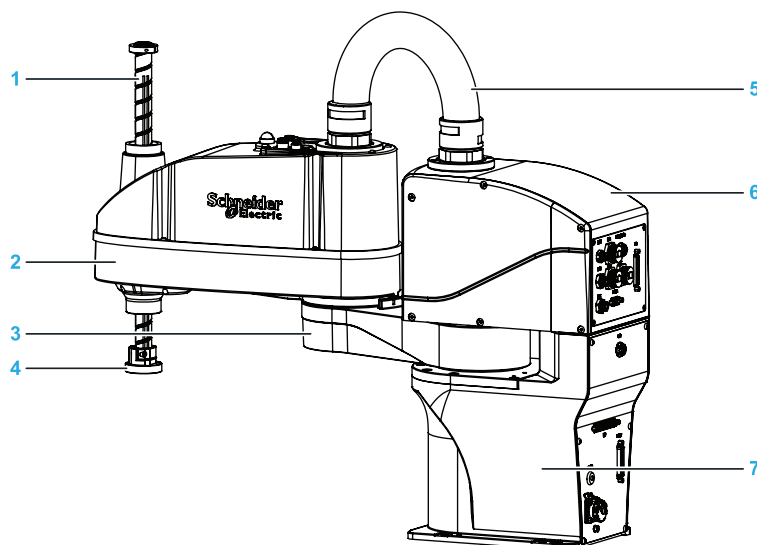
Number	Device name	Quantity ⁽¹⁾	Device type	Comment
1	Controller	1	LMC-02C	Logic Motion Controller
2	Sercos cable	1 or 2	VW3E5001R...	Sercos cable. The cable length depends on the distance between the controller and the Lexium SCARA.
3	Lexium SCARA	1	LXMRSP06..... ⁽²⁾	

(1) Quantity to be ordered.

(2) The device type depends on the Lexium SCARA reference and its characteristics. For further information, refer to [Commercial Reference](#), page 28.

Components Overview

The Lexium SCARA is composed of the following components:



- 1 Ball screw
- 2 Arm 2
- 3 Arm 1
- 4 Tool flange
- 5 Flexible tube
- 6 Control unit
- 7 Base

The interface panel, which is located at the back of the Lexium SCARA base, has connectors for power supply, communication ports, and status display LEDs.

Six through-holes are provided for robot mounting, and two dial-pin holes are provided to position the robot accurately.

Three sets of motors/gear reducers and ball screw are installed in arm 2, which provides fast motion and high accuracy positioning capability. Axis J3 and J4 are driven by timing belts.

Since the ball screw spindle is exposed, there is a risk of foreign matter attaching onto the shaft and cause damage.

<i>NOTICE</i>
FOREIGN MATTER ON BALL SCREW SPINDLE Inspect the ball screw spindle periodically and clean when necessary. Failure to follow these instructions can result in equipment damage.

For further information on the maintenance schedule, refer to [Maintenance Plan](#), page 78.

Commercial Reference

Overview

Example of a commercial reference for the Lexium SCARA:

Character position	1	2	3	4	5	6	7	8	9	10	11	12	13
Example	L	X	M	R	S	P	0	6	5	0	2	0	0

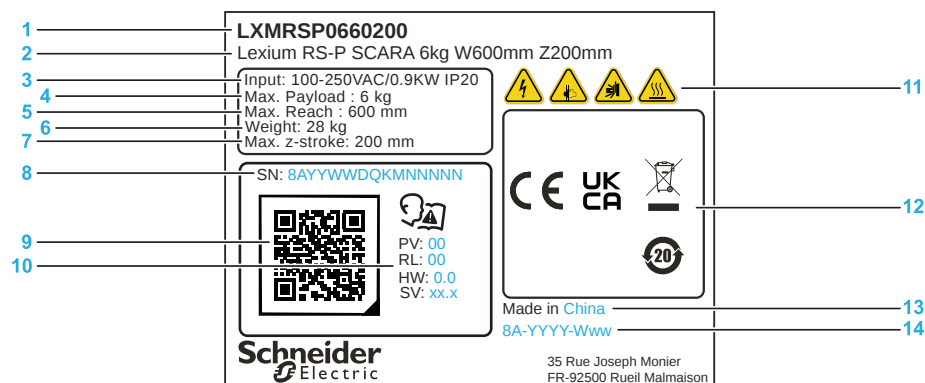
Description of the commercial reference structure with reference to the previous example:

Character position	Example	Item	Meaning
1...3	LXM	Family	Lexium
4, 5	RS	Robot/product type	Robot SCARA
6	P	Series	P = Precision Series
7, 8	06	Payload	06 = maximum payload 6 kg (13.2 lb) YY = Optional/replacement equipment
9, 10	50	Workspace	50 = Workspace of 500 mm (19.7 in) 60 = Workspace of 600 mm (23.6 in) 70 = Workspace of 700 mm (27.6 in) YY = Optional/replacement equipment
11	2	Z-axis stroke	2 = Vertical movement of 200 mm (7.9 in) 3 = Vertical movement of 300 mm (11.8 in) Y = Optional/replacement equipment
12, 13	00	Miscellaneous	00 = Standard ** = Accessories/spare part number

If you have questions concerning the commercial reference, contact your local Schneider Electric service representative.

Type Plate

Overview



1 Commercial reference*	10 Technical specifications:
2 Name	PV: Product version
3 Input power and ingress of protection	RL: Release version
4 Maximum payload	HW: Hardware version
5 Radius of the working space	SV: Software version
6 Weight of the robot	11 Alert symbols
7 Maximum Z-stroke	12 Certifications
8 Serial number	13 Country of origin
9 QR code on commercial reference and serial number	14 Date of manufacturing, plant code, followed by year and week of manufacture

* For detailed information about the meaning of the particular digits, refer to Commercial Reference, page 28.

Technical Data

Ambient Conditions

Overview

Procedure	Parameter	Unit	Value
Operation	Ambient temperature	°C (°F)	0...40 (32...104)
	Altitude	m (ft)	≤ 1000 (3281): no derating of performance > 1000 (3281) ≤ 1500 (4921): 10% derating of performance > 1500 (4921) ≤ 2000 (6562): 20% derating of performance
	Condensation	-	prohibited
	Formation of ice	-	prohibited
	Relative humidity	%	10...80
	Vibration according to IEC 60721-3-3 3M11 standard: - Stationary vibration, random - Frequency range: 5...200Hz - No shock	m/s ² (ft/s ²)	0.01 (0.033)
Transport	Ambient temperature	°C (°F)	-20...60 (-4...140) ¹⁾
	Condensation	-	prohibited
	Precipitation	-	prohibited
	Formation of ice	-	prohibited
	Other liquid	-	prohibited
	Wetness	-	prohibited
	Relative humidity	%	10...90
Long-term storage in transport packaging	Ambient temperature	°C (°F)	-20...60 (-4...140) ¹⁾
	Condensation	-	prohibited
	Precipitation	-	prohibited
	Formation of ice	-	prohibited
	Other liquid	-	prohibited
	Relative humidity	%	10...90
	Maximum storage period	months	12
Environ-ment	Located outdoors	-	prohibited
	Direct exposure to the sun	-	prohibited
	Flammable gas, dust or liquid	-	prohibited
	Corrosive gas, dust or liquid	-	prohibited
Fast transients	AC power port	kV	2
	Signal/control port	kV	1
Electrostat-ic discharge	Contact discharge	kV	4
	Air discharge	kV	8
¹⁾ Limit rapid temperature change to maximum 10 °C (50 °F) per hour.			

The robot is not suited to operate in an environment outside of the above-mentioned conditions. Be aware that if the equipment is used in an environment where temperature and/or humidity vary considerably, water condensation may form inside the robot.

<i>NOTICE</i>

INOPERABLE EQUIPMENT

- | |
|---|
| <ul style="list-style-type: none">• Ensure that the ambient temperature and humidity of the installed equipment are kept relatively constant.• Do not operate the robot in a corrosive (acidic or alkaline) environment, as this may affect the life of the robot. |
|---|

Failure to follow these instructions can result in equipment damage.

For further information about storage conditions, refer to Transport and Storage , page 53.

Mechanical and Electrical Data

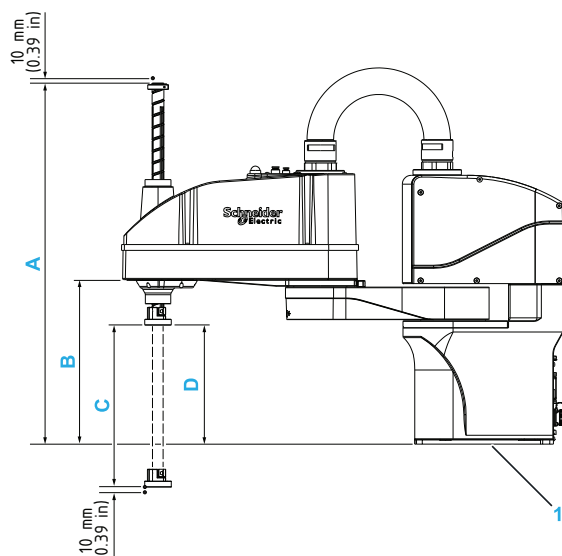
Mechanical and Electrical Data of LXMRSP06•••••

Mechanical Data

			Workspace of 500 mm (19.7 in)		Workspace of 600 mm (23.6 in)		Workspace of 700 mm (27.6 in)	
Model		Unit	LXMRS-P0650200	LXMRS-P0650300	LXMRS-P0660200	LXMRS-P0660300	LXMRS-P0670200	LXMRS-P0670300
Arm length	Full arm length	mm (in)	500 (19.7)		600 (23.6)		700 (27.6)	
	J1	mm (in)	225 (8.9)		325 (12.8)		425 (16.7)	
	J2	mm (in)	275 (10.8)					
Maximum speed	J1+J2	mm/s (in/s)	7050 (278)		7750 (305)		8450 (333)	
	J3	mm/s (in/s)	1100 (43)					
	J4	deg/s	2150					
Work space	Horizontal	mm (in)	500 (19.7)		600 (23.6)		700 (27.6)	
	Vertical	mm (in)	200 (7.9)	300 (11.8)	200 (7.9)	300 (11.8)	200 (7.9)	300 (11.8)
	J1	°	+/-130					
	J2	°	+/-129		+/-148		+/-149	
	J3	mm (in)	200 (7.9)	300 (11.8)	200 (7.9)	300 (11.8)	200 (7.9)	300 (11.8)
	J4	°	+/-360					
Repeatability	J1+J2	mm (in)	+/-0.02 (+/-0.000787)					
	J3	mm (in)	+/-0.01 (+/-0.000394)					
	J4	°	+/-0.01					
Rated payload		kg (lb)	2 (4.4)					
Maximum payload		kg (lb)	6 (13.2)					
J4 rated moment of inertia		kg·m2 (lb·in2)	0.01 (34.172)					
J4 maximum moment of inertia		kg·m2 (lb·in2)	0.12 (410)					
Total weight		kg (lb)	27 (59)		28 (62)		29 (64)	

		Workspace of 500 mm (19.7 in)		Workspace of 600 mm (23.6 in)		Workspace of 700 mm (27.6 in)	
Model	Unit	LXMRS-P0650200	LXMRS-P0650300	LXMRS-P0660200	LXMRS-P0660300	LXMRS-P0670200	LXMRS-P0670300
Rated input voltage	V ac	100...170, derating of ~15% 170...250, no derating Frequency: 50/60 Hz					
Rated / maximum power	kW	0.9 / 2					
Air hose	mm Ø (in Ø)	1 x 4 (0.157) 2 x 6 (0.236)					
Communication	–	Sercos					
Noise level	dB	≤ 70					
Mounting	–	Tabletop					
Ingress of protection	–	IP20					
Operating environment	–	Standard ⁽¹⁾					
(1) For further information, refer to Ambient Conditions, page 30.							

Vertical Workspace



1 Base mounting surface

Dimension	Unit	LXMRS-P0650200	LXMRS-P0650300	LXMRS-P0660200	LXMRS-P0660300	LXMRS-P0670200	LXMRS-P0670300
A	mm (in)	610 (24)	710 (28)	610 (24)	710 (28)	610 (24)	710 (28)
B	mm (in)	277.7 (11)				279.7 (11)	
C	mm (in)	200 (7.9)	300 (11.8)	200 (7.9)	300 (11.8)	200 (7.9)	300 (11.8)
D	mm (in)	201.7 (8)					

These dimensions represent:

A – The distance from the top of the ball screw at its highest point to the base mounting surface.

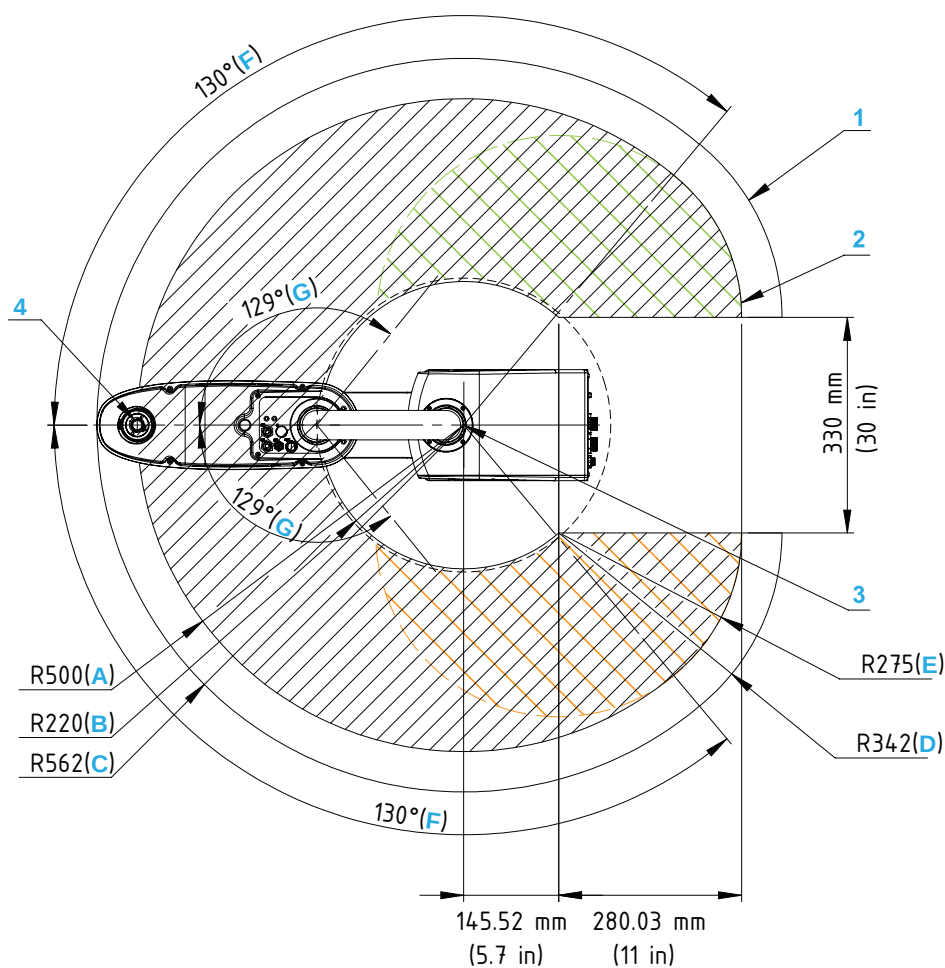
B – The distance from the bottom of arm 2 to the base mounting surface.

C – The nominal working range of the Z axis.

D – The distance from the surface of the tool flange at its highest point to the base mounting surface.

Horizontal Workspace

Horizontal workspace of Lexium SCARA with workspace of 500 mm (19.7 in):



1 Maximum area

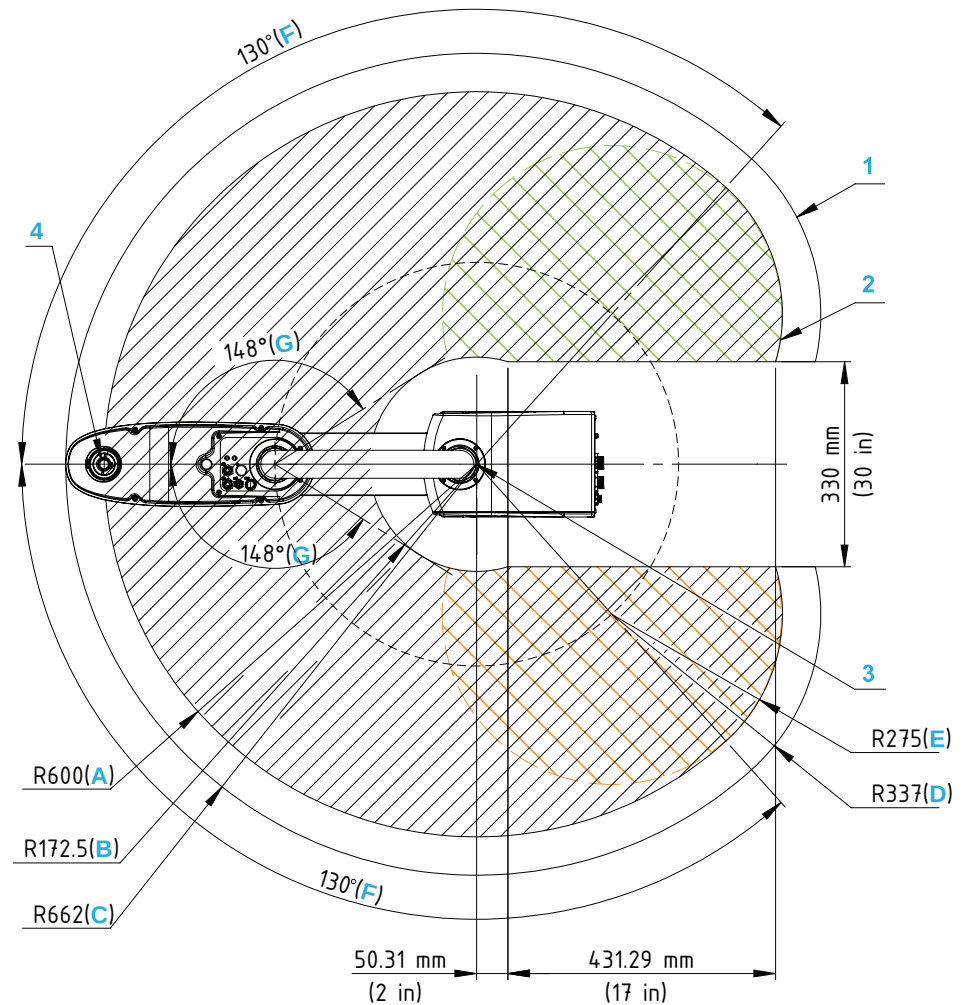
2 Motion area

3 Joint 1 rotation center

4 Joint 3 rotation center

NOTE: The orange and green circles represent the reduced working area in relation to the arm configuration (left or right).

Horizontal workspace of Lexium SCARA with workspace of 600 mm (23.6 in):



1 Maximum area

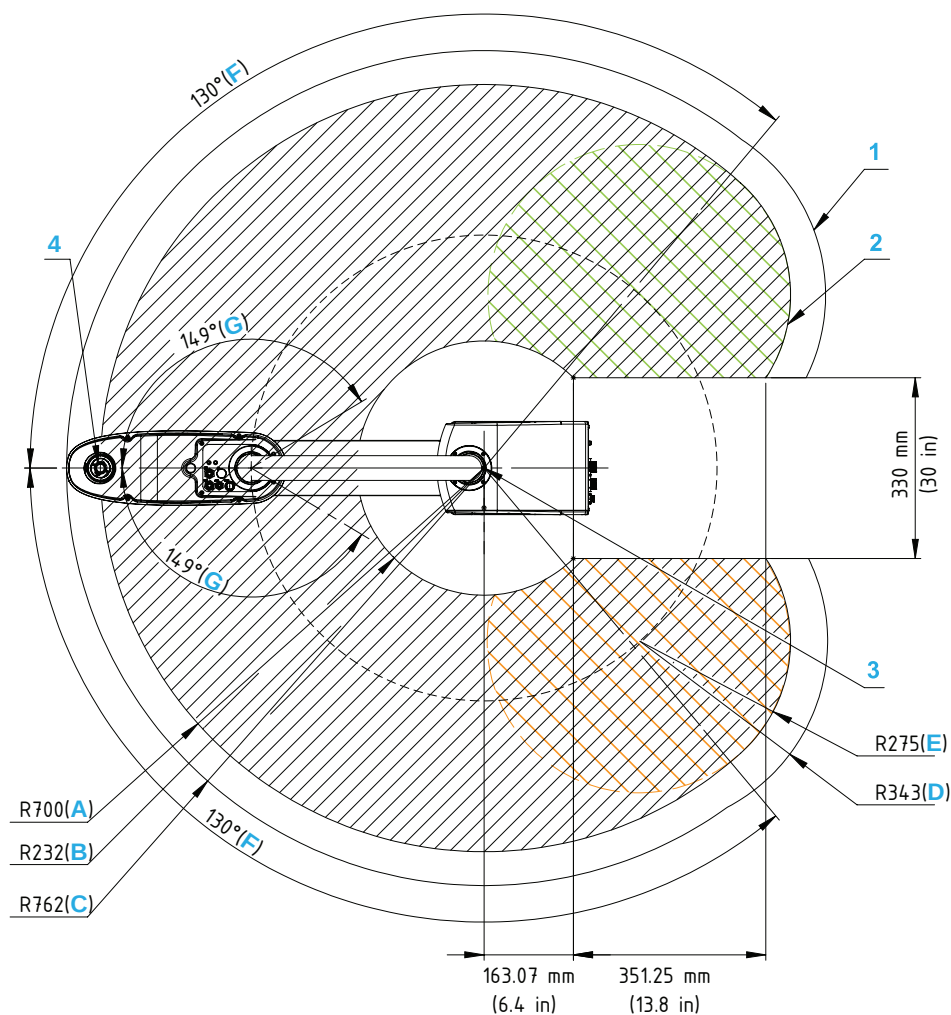
2 Motion area

3 Joint 1 rotation center

4 Joint 3 rotation center

NOTE: The orange and green circles represent the reduced working area in relation to the arm configuration (left or right).

Horizontal workspace of Lexium SCARA with workspace of 700 mm (27.6 in):



1 Maximum area

2 Motion area

3 Joint 1 rotation center

4 Joint 3 rotation center

NOTE: The orange and green circles represent the reduced working area in relation to the arm configuration (left or right).

Dimension	Description	Unit	LXMRS-P0650200	LXMRS-P0660200	LXMRS-P0670200
			LXMRS-P0650300	LXMRS-P0660300	LXMRS-P0670300
A	Maximum working radius	mm (in)	500 (19.7)	600 (23.6)	700 (28)
B	Minimum working radius	mm (in)	220 (8.7)	172.5 (6.8)	232 (9.1)
C	Maximum radius occupied by robot	mm (in)	562 (22)	662 (26)	762 (30)
D	Maximum radius occupied by robot, in the extreme end of joint 1 travel	mm (in)	342 (13.5)	337 (13.3)	343 (13.5)
E	Maximum working radius, in the extreme end of joint 1 travel	mm (in)	275 (10.8)	275 (10.8)	275 (10.8)

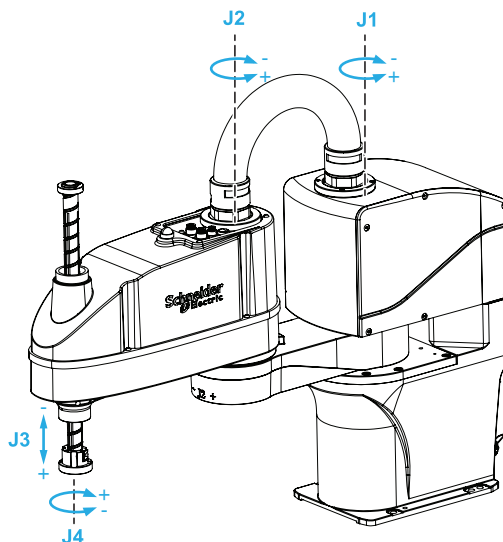
Dimension	Description	Unit	LXMRS-P0650200	LXMRS-P0660200	LXMRS-P0670200
			LXMRS-P0650300	LXMRS-P0660300	LXMRS-P0670300
F	Maximum joint 1 angle travel range	°	130		
G	Maximum joint 2 angle travel range	°	129	148	149

Coordinate Systems

Joint Coordinate System

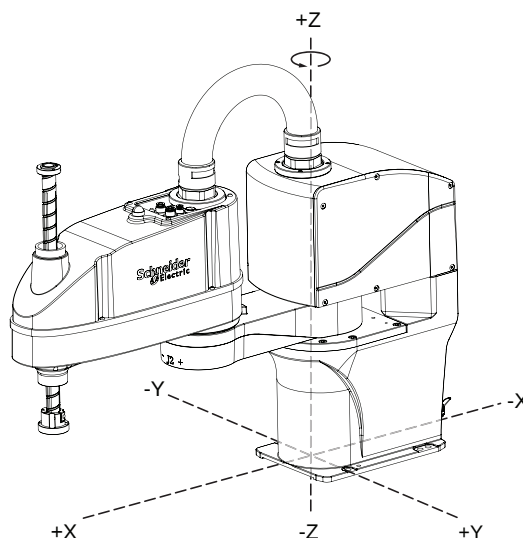
The position of the robot is represented by the rotation angle of each axis.

The + and - signs indicate travel directions of individual axes of the joint coordinate system. These differ from the Cartesian positions of the TCP (Tool Center Point) of the robot.



Robot Coordinate System

The + and - signs indicate the axes directions of the Cartesian coordinate system. These differ from the travel direction of the individual axes of the robot.

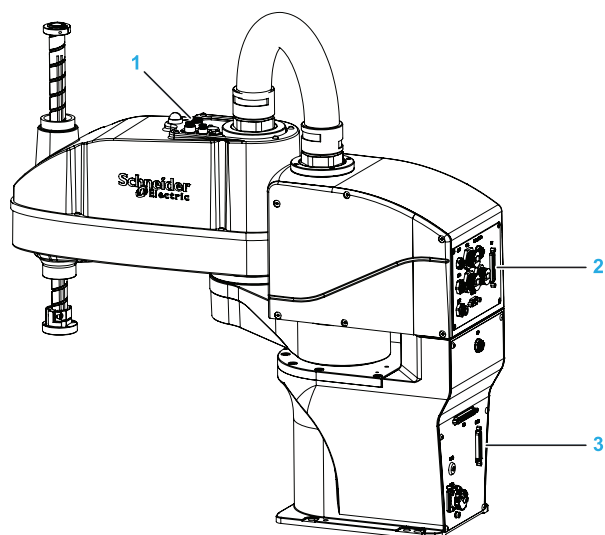


Electrical Connections

Interface Panels

Overview

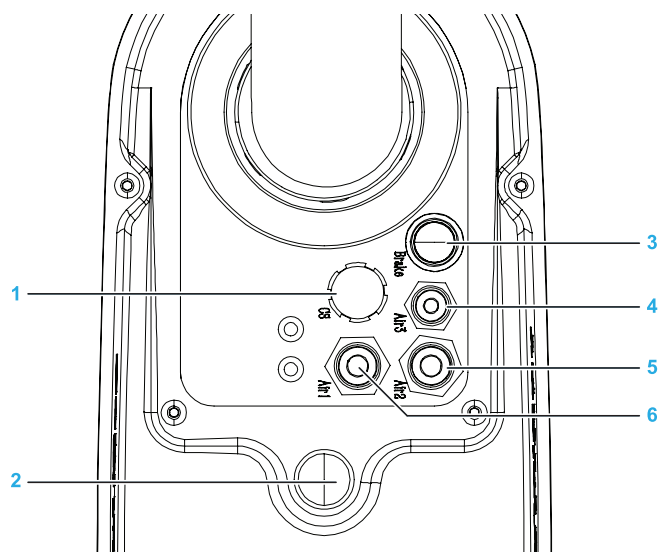
The following figure presents the location of the three interface panels of the Lexium SCARA.



- 1 Arm 2 interface panel
- 2 Control unit interface panel
- 3 Base interface panel

Arm 2 Interface Panel

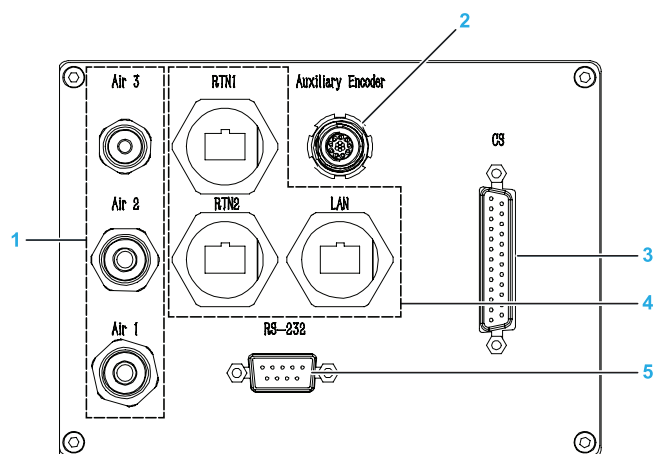
The following figure presents the arm 2 interface panel.



- 1 **CS**: Customer Signal interface (Customer Signal)
- 2 Robot Status indicator, see [Status Indicators](#), page 44
- 3 **Brake**: Brake release button
- 4 **Air3**: Air hose 3: Ø 4 mm (0.157 in)
- 5 **Air2**: Air hose 2: Ø 6 mm (0.236 in)
- 6 **Air1**: Air hose 1: Ø 6 mm (0.236 in)

Control Unit Interface Panel

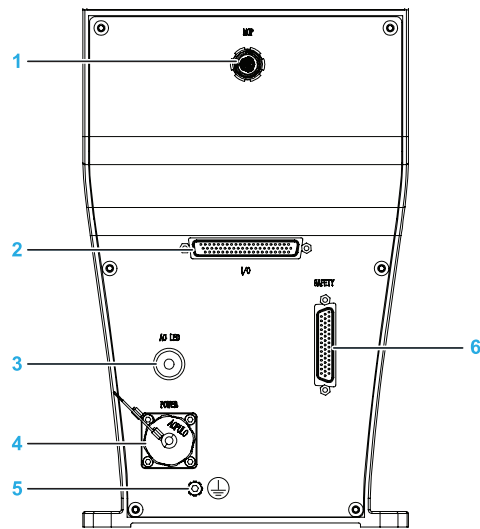
The following figure presents the control unit interface panel.



- 1 **Air1**: Air hose 1: Ø 6 mm (0.236 in)
Air2: Air hose 2: Ø 6 mm (0.236 in)
Air3: Air hose 3: Ø 4 mm (0.157 in)
- 2 **Auxiliary Encoder**: Reserved
- 3 **CS**: Customer Signal interface (Customer Signal)
- 4 **RTN1**: Sercos port 1
RTN2: Sercos port 2
LAN: Reserved
- 5 **RS-232**: Reserved

Base Interface Panel

The following figure presents the base interface panel.



- 1 MCP:** Reserved: use MCP (Manual Control Pendant) jumper plug
- 2 I/O:** Reserved
- 3 AC LED:** Main power indicator light
- 4 POWER:** AC power supply connector
- 5** : Earth ground connection
- 6 SAFETY:** Emergency stop connector

Status Indicators

Main Power Indicator

The main AC power is located at the base of the robot.

Status	Description
OFF	Indicates the AC power to the Lexium SCARA is OFF.
ON (green)	Indicates the AC power to the Lexium SCARA is ON.

Robot Status Indicator (Arm 2)

The robot status indicator is located at the top of arm 2. It is a circular LED light, and it displays different color patterns depending on the robot status.

Status	Description
OFF	Indicates that the robot axes position control is not active.
ON (green)	Indicates that the robot axes position control is active (drive enabled).
Flashing 1 Hz	During initialization, the light flashes and it is turned OFF when initialization is completed.
Flashing 5 Hz	Indicates that the firmware download or update is in progress. NOTE: Do not power off the robot during the firmware download and update.
Flashing 2 Hz	Indicates that the firmware download or an update step is successfully completed. See Updating the Firmware of the Robot , page 71
Flashing 5 Hz, 5 Hz, 1 Hz	Indicates a firmware update error. See Troubleshooting , page 81.

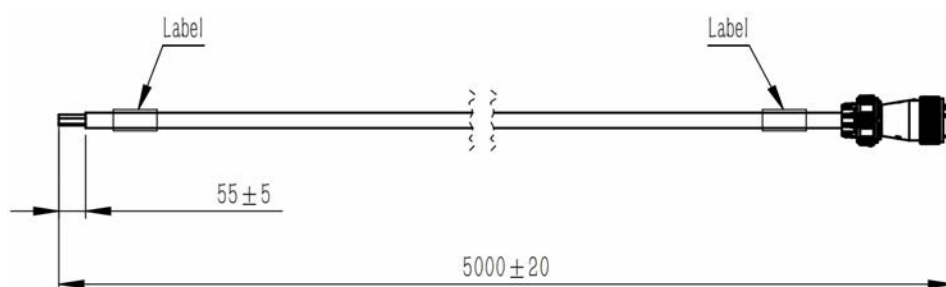
Connector Definitions

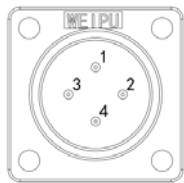
Overview

This section provides detailed functions and descriptions of pins on the power interface, of the interface of the control unit and of the customer signal interface (**CS**) on the arm 2.

AC Power Supply Connector (POWER)

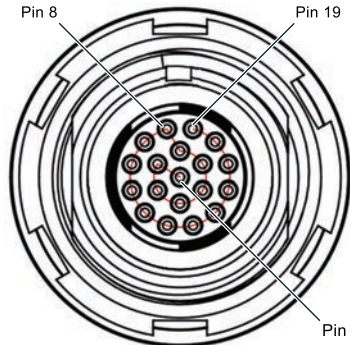
The **POWER** connector is located at the robot base. The corresponding preconfigured cable is labeled **Cable_POWER** and presented in the following figure. The cable has an free-end and a connector. The connector is IP67 rated with an input voltage rating of 100...250 V ac. The minimum bending radius of this cable is 54 mm (2.13 in).



Pin	Label	Wire color	Description	Power Supply Connector
1	L	Brown	Live wire	 4-pin plug-type connector, front pinout
2	N	Blue	Neutral wire	
3	PE	Yellow/Green	Ground wire	
4	—	—	—	

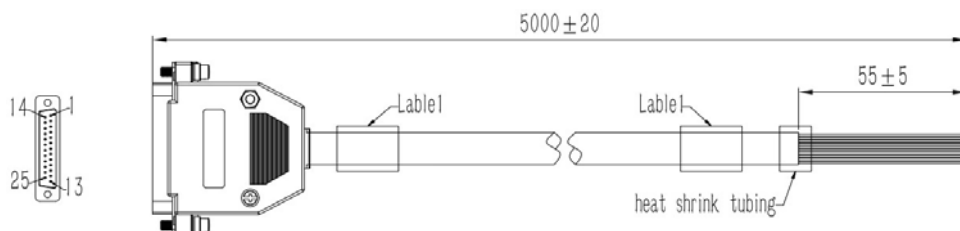
MCP Connector (Reserved)

The robot is equipped with a jumper plug that must be installed on the MCP connector. It must be installed prior to the operation of the equipment.

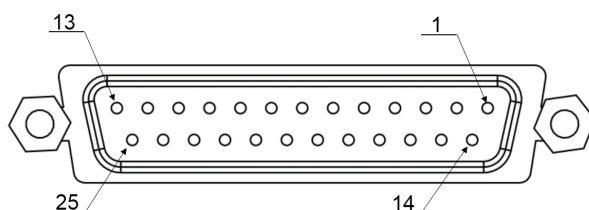
Pin	Label	Description	Representation
01...06	—	Reserved	 19-pin socket-type connector, front pinout
07	Jumper 1	Jumpered to pin 8	
08	Jumper 1	Jumpered to pin 7	
09	—	Reserved	
10	—	Reserved	
11	Jumper 2	Jumpered to pin 13	
12	—	Reserved	
13	Jumper 2	Jumpered to pin 11	
14...19	— (not used)		

Customer Signal (CS) Connector on Control Unit

The preconfigured cable used for the **CS** customer signal connector on the control unit is labeled **Cable_Base CS** and presented in the following figure. The cable has an open end and a connector. The minimum bending radius of this cable is 51 mm (2 in).



25-pin socket-type connector, front pinout

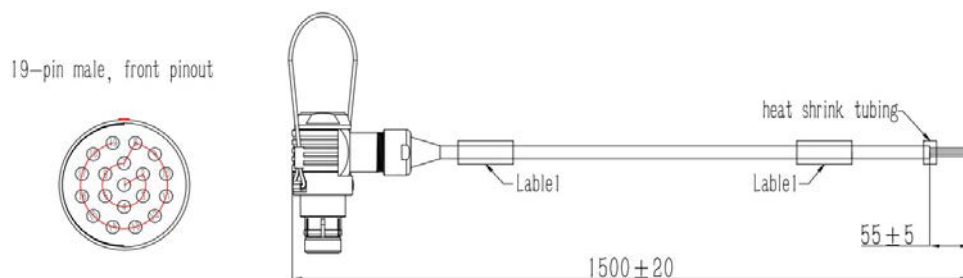


The wires at the open end of the cable are defined as follows:

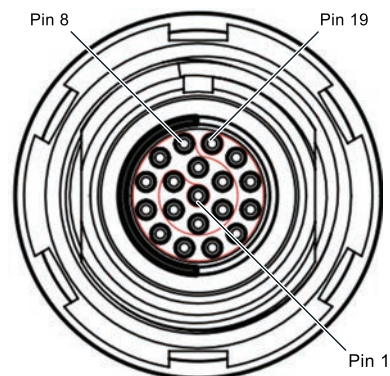
Pin	Wire color	Pin	Wire color
01	Black	11	Pink
02	Brown	12	White/Black
03	Red	13	White/Brown
04	Orange	14	White/Red
05	Yellow	15	White/Orange
06	Green	16	White/Yellow
07	Blue	17	White/Green
08	Purple	18	White/Blue
09	Gray	19...25	– (not used)
10	White		

Customer Signal (CS) Connector on Arm 2

The cable used for the **CS** customer signal connector on arm 2 is labeled **Cable_Arm CS** and presented in the following figure. The connector is IP67 rated. The minimum bending radius of this cable is 51 mm (2 in).



19-pin socket-type connector, front pinout



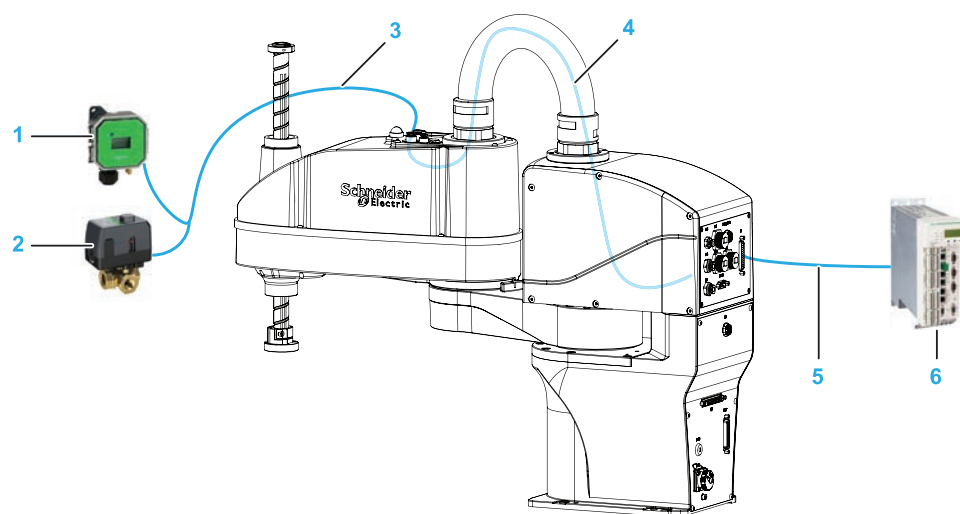
The wires at the open end of the cable are defined as follows:

Pin	Wire color	Pin	Wire color
01	Black	11	Light blue
02	White	12	Pink
03	Red	13	Light green
04	Green	14	Light yellow
05	Yellow	15	Light brown
06	Brown	16	Light purple
07	Blue	17	Light gray
08	Orange	18	Transparent
09	Gray	19	– (not used)
10	Purple		

Application Example of Using CS Connectors and Cables

Two end-of-arm devices are used. One is a pressure sensor and the other is a solenoid valve. The pressure sensor provides a digital signal when triggered, and the solenoid valve is controlled by a digital signal. The I/O states of the signals are monitored/controlled by an application program on a controller. The 24 V dc power supply is supplied to the devices through the customer signal cable.

As presented in the following figures, external wires are used to connect from the devices to the CS connector on the arm 2 (solid blue lines). Internal wiring (solid light blue line) is used to exchange signals between the robot base and the arm 2.



1 Pressure sensor

2 Solenoid valve

- 3 Customer signal cable
- 4 Robot internal cables
- 5 CS cable with D-SUB25 connector
- 6 PacDrive controller I/O and 24 V dc

Power supply of the devices:

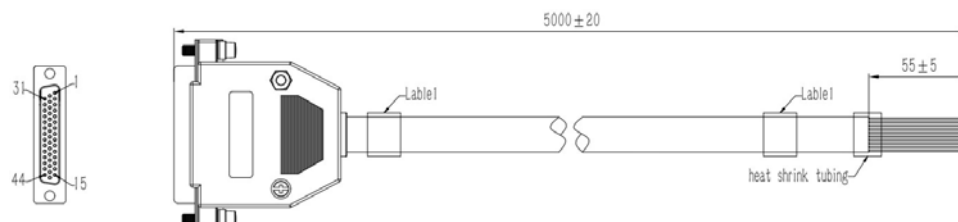
- An external 24 V dc power supply can be used to power a device mounted on arm 2.
Therefore, two or more wires (for example, wire 1 and 2) of the preconfigured CS cable (with D-Sub25, at robot base) can be used.
- From the preconfigured CS cable (with 19-pin connector, on arm 2), the corresponding wires (for example, wire 1 and 2) must be connected to both devices to provide power.

Digital input and output signals from/to the devices:

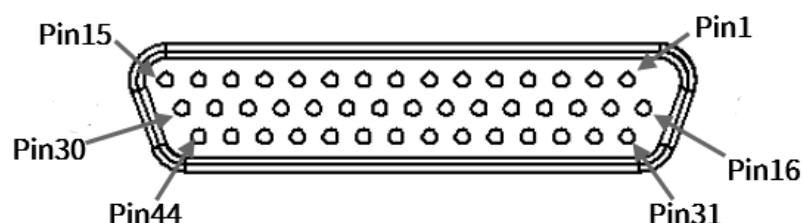
- The controller or a connected I/O device provides the digital input and output signals.
These must be connected to the required wires (for example, wire 3...6) of the preconfigured CS cable (with D-Sub25, at robot base).
- The corresponding wires (for example, wire 3...6) of the preconfigured CS cable (with 19-pin connector, on arm 2), must be connected to both devices to get/set the I/O state.

Emergency Stop Connector (SAFETY)

The emergency stop connector at the robot base is labeled **SAFETY**. The corresponding preconfigured cable is labeled **Cable SAFETY** and presented in the figure above. The cable has a D-Sub44 connector and an open end. The minimum bending radius of this cable is 51 mm (2 in).



Pin definition of the emergency stop connector:

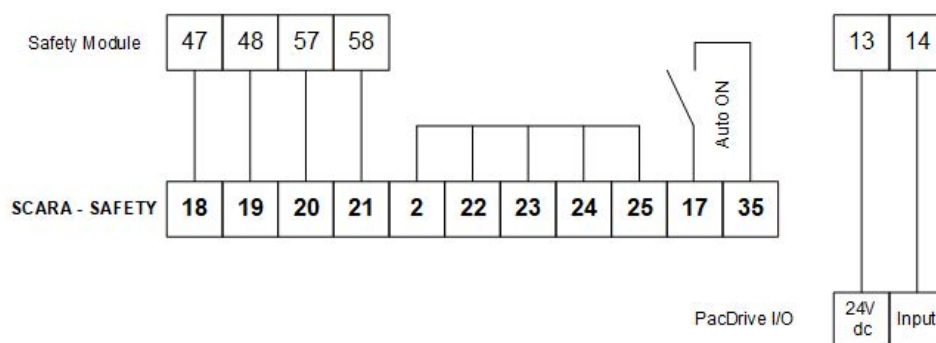
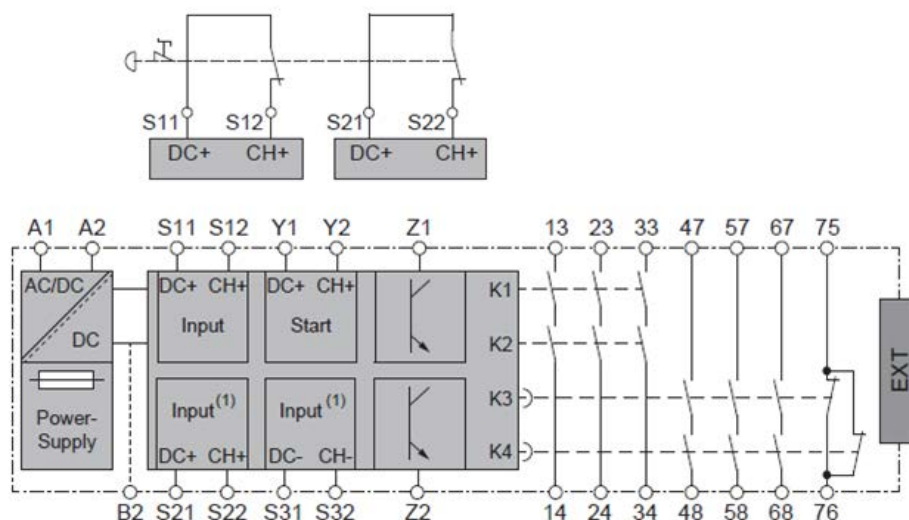


The wires at the open end of the cable are defined as follows:

Pin	Wire color	Function	Description
01	Black	24 V dc	24 V dc output
02	Brown	24 V dc GND	24 V dc grounding potential
03	Red	E-Stop State 1	Emergency stop output 1
04	Orange	E-Stop State 2	Emergency stop output 2
05...15	–	–	Reserved
16	Yellow	24 V dc	24 V dc output
17	Green	24 V dc GND	24 V dc grounding potential
18	Blue	E-Stop channel 1A	User emergency stop 1
19	Purple	E-Stop channel 1B	User emergency stop 1
20	Gray	E-Stop channel 2A	User emergency stop 2
21	White	E-Stop channel 2B	User emergency stop 2
22	Pink	Protective Stop channel 1	User protective stop 1
23	White/Black	Protective Stop channel 2	User protective stop 2
24	White/Brown	Functional safety device 1	User functional safety device 1
25	White/Red	Functional safety device 2	User functional safety device 2
26..30	–	–	Reserved
31	White/Orange	24 V dc	24 V dc output
32	White/Yellow	24 V dc GND	24 V dc grounding potential
33, 34	–	–	Reserved
35	White/Purple	Auto_On ⁽¹⁾	Power enable confirmation
36...44	–	–	Reserved
(1) Before the robot accepts commands from the controller via Sercos, a confirmation is required after the robot has been powered on. For the confirmation pulse, the Auto_On input is used (pin 17 and pin 35, button or...). The Auto_On signal must be considered in the safety assessment.			

The D-Sub44 connector must be connected to the **SAFETY** connector at the robot base and the open end of the **Cable_SAFETY** cable must be connected to the functional safety circuit of the machine.

Wiring example with Safety Module XPSUAT•3A3A•



For further information on wiring, refer to the hardware guide of the safety module.

Connection Sercos III (RTN1 and RTN2)

Pin	Signal name	Description	Representation
01	Tx+	Transmit signal +	Pin8 Pin1 8-pin, front interface
02	Tx-	Transmit signal -	
03	Rx+	Receive signal +	
04	-	Reserved	
05	-	Reserved	
06	Rx-	Receive signal -	
07	-	Reserved	
08	-	Reserved	

The following table presents the cable specifications:

Shield	Required, both ends grounded
Twisted pair	Required
PELV	Required
Cable composition	4 x 0.14 mm ² (AWG 24)
Connector type	RJ45

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Do not connect any wiring to reserved, unused connections, or to connections designated as No Connection (N.C.).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Use pre-assembled cables to reduce the risk of wiring errors, see [System Setup](#), page 26.

Verify that the connector locks snap in properly.

Design of the Robot Frame

Overview

Use the Lexium SCARA for floor mounting only. For special applications, contact your local Schneider Electric service representative.

- When determining the suspension height of the robot, observe the overall height of the gripper (suction cup or other product pickups).
- For the design of the robot frame, account for possible varying gripper heights. Possibly design the robot suspension in a height-adjustable manner.

The precision of the robot in the application is also determined by the frame. Deformations of the frame cause imprecisions on the Tool Center Point (TCP).

General Requirements Regarding the Frame

The frame must not only permanently withstand the forces and torques (refer to *Mechanical Data*, page 32 of the respective robot), but also have sufficient stiffness so that the occurring deformations and vibrations do not lead to any major deviations on the TCP. Ensure a sufficient transverse bracing in the frame.

The forces and torques to be taken up by the frame during normal operation are the configuration of the robot mechanism, the speed, the acceleration, as well as the connected payload, all of which affect the total energy, and may possibly cause damage.

NOTE: Fasten the robot with at least class 8.8 screws. For more information, refer to the respective dimensional drawing in *Mechanical and Electrical Data of LXMRSP06.....*, page 32.

WARNING

CRUSHING, SHEARING, CUTTING AND IMPACT INJURY

- The robot must be operated only within an enclosure supported by a frame.
- Open or enter the enclosure for cleaning and maintenance purposes only.
- Design the enclosure to withstand an impact from the robot and to resist ejected parts from escaping the zone of operation.
- Design the enclosure to safely deactivate the robot as soon as a person enters the zone of operation of the robot.
- All barriers, protective doors, contact mats, light barriers, and other protective equipment, must be configured correctly and enabled whenever the robot mechanics are under power.
- Define the clearance distance to the zone of operation of the robot so the operational staff do not have access to, nor can be trapped by, the robot mechanics zone of operation.
- Design the enclosure to account for the maximum possible travel paths of the robot; that is, the maximum path until the hardware safety system limits as well as the additional run-on paths, in case of a power interruption.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Transport and Commissioning

Transport and Unpacking

Transport and Storage

Overview

Ensure to follow the following instructions while storing or transporting a robot.

⚠ WARNING

FALLING HEAVY LOAD

- Ensure that the Lexium SCARA is properly secured and stabilized when you transport it or move it.
- When lifting a robot with a crane, ensure to stabilize it during movement. A loss of balance may cause the robot to fall, which could result in robot damage or personnel injury.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

If the robot has been stored or inactive for an extended period of time, ensure that the robot starts at a reduced speed when it is operated. After running for a while without issues, it can be run at full speed again. For more information on warming up the robot, see [Commissioning Procedure](#), page 70.

If condensation forms when the robot is put in storage, or after transportation, ensure that it is fully cleaned before operation.

Transport Conditions

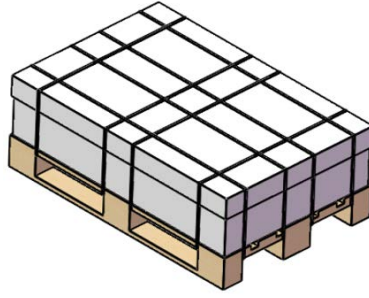
The Lexium SCARA must be handled with care. Shocks and impacts may damage the robot. Damage may lead to reduced running accuracy, reduced service life, or to inoperable equipment.

The robot is preassembled before transport.

NOTE: Before unpacking and installing the robot, ensure that the lifting capacity of the lifting devices (forklift truck and crane or hoist) is sufficient to lift the robot.

For detailed information about transport conditions, refer to [Ambient Conditions](#), page 30.

Packaging of the Lexium SCARA



Size and weight of the packaging:

Parameter	Lexium SCARA
Packing case L x H x W	1200 x 409 x 800 mm (47 x 16 x 31.5 in)
Gross weight	52 kg (115 lb)

Storage

The Lexium SCARA can be stored inside the packaging or unpacked. In both cases, ensure that it is stored in a sheltered and dry place. Avoid humidity which can have corrosive effects on the robot.

Unpacking

Overview

A proper installation of the robot is essential for its run-time operation. Special attention should be paid to securing the robot base to its foundation, since it needs to be able to withstand the forces and torques generated during motion. Use the following instructions to properly install the robot.

Handling of the crate should be carried out by qualified personnel. Take care not to impact the equipment during unpacking.

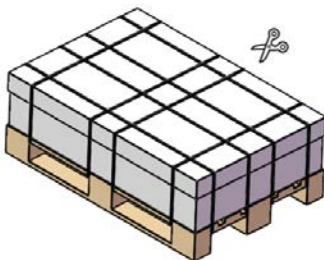
⚠ WARNING

FALLING LOADS

- Handle the Lexium SCARA by at least two people.
- Wear protective equipment when handling the Lexium SCARA.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Unpacking

Step	Action
1	Cut the cable ties outside the packaging carton. 
2	Open the carton and lift out the robot and accessories box. NOTE: Store the carton for later use.
3	Verify the contents of the carton using the packing list from Scope of Delivery, page 25, and inspect the equipment for transport damage. NOTE: In case of transport damages, contact your local Schneider Electric service representative.

Mechanical Installation

Information About Installation

Overview

Proceed with care during the following steps in order to help prevent the following points:

- Injuries and material damage
- Incorrect installation and programming of components
- Incorrect operation of components
- Use of non-authorized cables or modified components

For further information, refer to [Hazard Information](#), page 11.

Installation Requirements

The Lexium SCARA is designed for floor mounting. The shape and size of the robot mounting rack vary according to its use. However, it must withstand the weight of the robot and the dynamic force produced during its motion. Here are some mounting requirements:

- Reinforce the mounting rack with a truss.
- The bottom surface of the robot must be parallel to the mounting surface of the rack.
- The area of the mounting surface must be no less than that of the bottom surface of the robot.
- Securely bolt the rack to the ground to make sure it does not move.
- The holes on the rack for installing the robot must be M8 threaded holes. When installing the robot, the strength of the bolts must meet ISO 898-1 property class 10.9 or 12.9 standard.

To minimize vibration, the bottom plate of the robot should be a steel plate with the following characteristics:

- Thickness: > 20 mm (0.79 in)
- Surface roughness: < 12.5 μm (492 μin)
- Flatness: < 0.5 mm (0.0197 in)

⚠ CAUTION

PINCH POINTS

Pay attention to the robot pinch points.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

INSUFFICIENT INSTALLATION

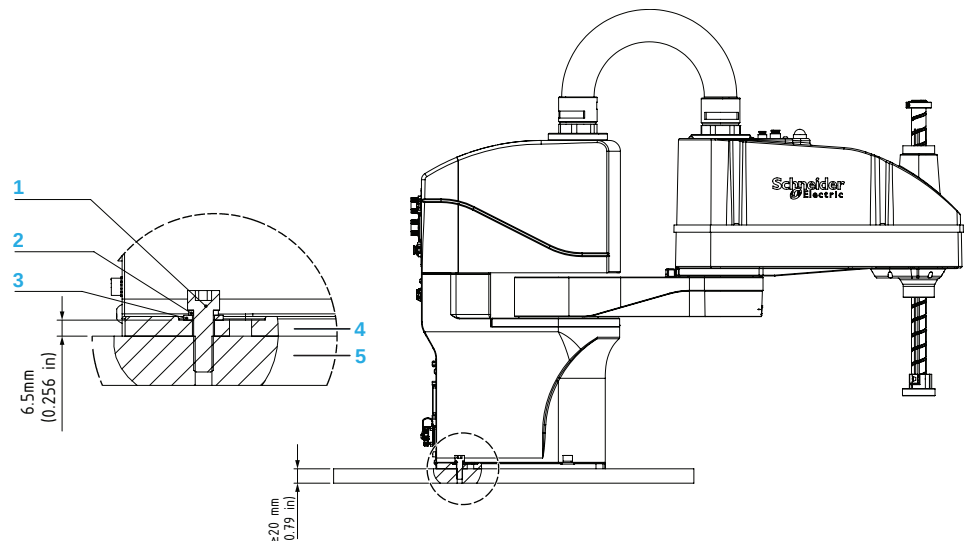
Ensure that the robot base is stable to avoid adverse effects, such as vibration and/or position inaccuracy, during robot motion.

Failure to follow these instructions can result in equipment damage.

Mounting the Robot

Base Mounting

Use bolts, elastic washers, and flat washers for base mounting. The dimensions and installation of the bolts and washers are presented in the following figure.



1 Hexagon socket screw M8x25 (4 pieces)

2 Spring washer

3 Flat washer

4 Robot base

5 Bottom plate

For further information on the mounting dimensions, refer to Dimensional Drawing of LXMRSP06, page 34.

Mounting the Robot

Position the robot via the two dial-pins and secure the robot base by screwing down four bolts through the mounting holes. Use the hexagon bolts, elastic washers, and flat washers.

Torque requirement for base mounting bolt:

- 4 securing screws: M8x25
- Torque requirement: 35 Nm (310 lbf-in)

NOTE: To prevent the hexagon bolts from getting loose during robot operation, tighten them according to torque requirements.

⚠ WARNING

FALLING LOADS

- Handle the Lexium SCARA by at least two people.
- Wear protective equipment when handling the Lexium SCARA.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Pneumatic Installation

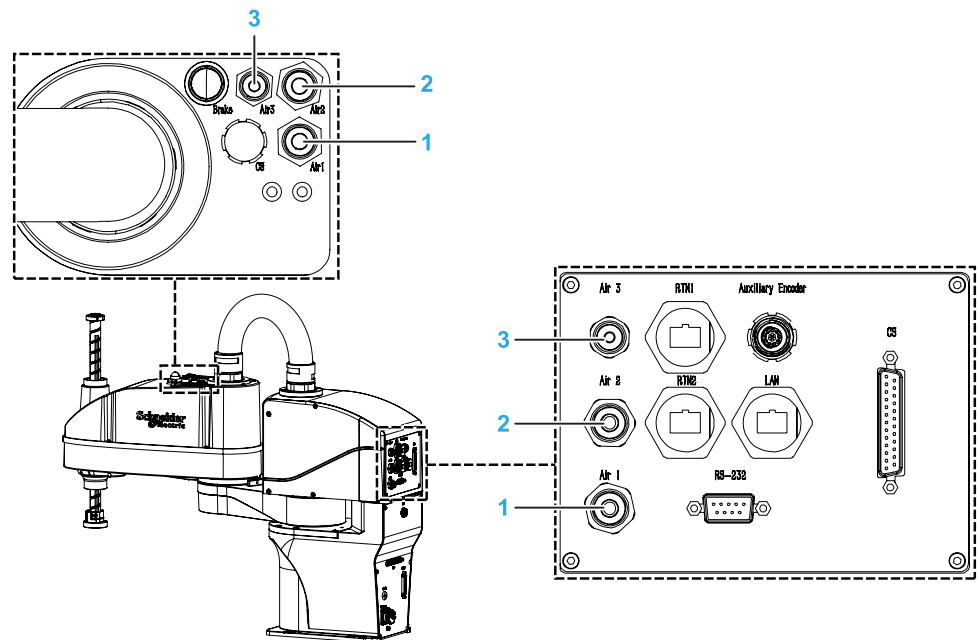
Overview

Three air hoses link the base to the arm 2. If needed, connect **Air 1** both on the base and on the arm 2 to use a pneumatic device. Additionally, you can connect the two **Air 2**, and/or the two **Air 3**.

Maximum pressure: 10 bar (145 psi)

The connections are made using press-on fittings for polyurethane tubing with an internal diameter of:

- 6 mm (0.236 in) for air hose 1 and 2
- 4 mm (0.157 in) for air hose 3



1 Air 1: connection for air hose 1

2 Air 2: connection for air hose 2

3 Air 3: connection for air hose 3

⚠ WARNING

FALLING HEAVY LOAD

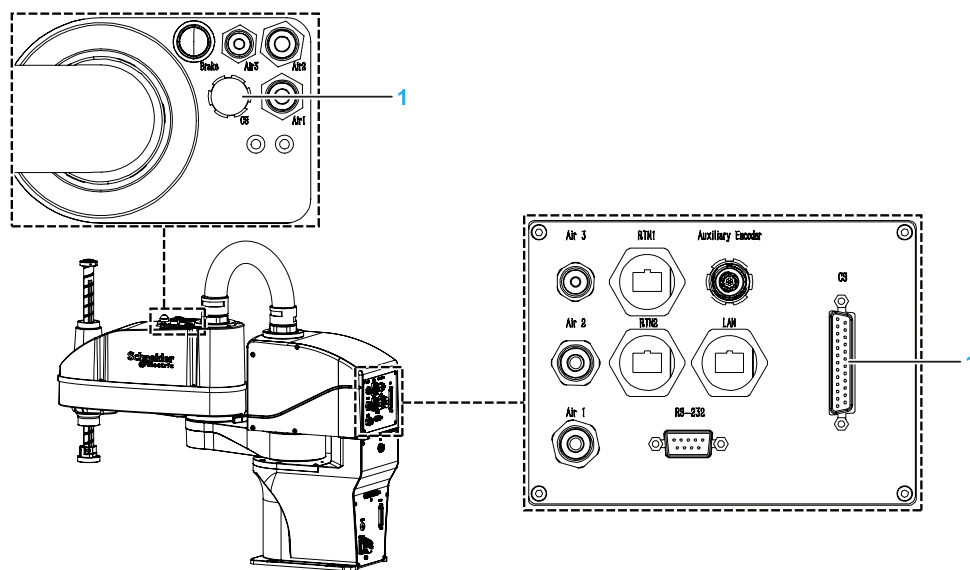
Verify in the application that the gripper is designed to hold the load with the accelerations programmed, as well as in the event of an electrical power outage or an inoperative air supply.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

CS Connection

Overview

If needed, connect CS both on the base and on the arm 2 to connect an electric device. The maximum voltage and current are respectively 30 V dc and 0.6 A.



1 CS connection

Electrical Installation

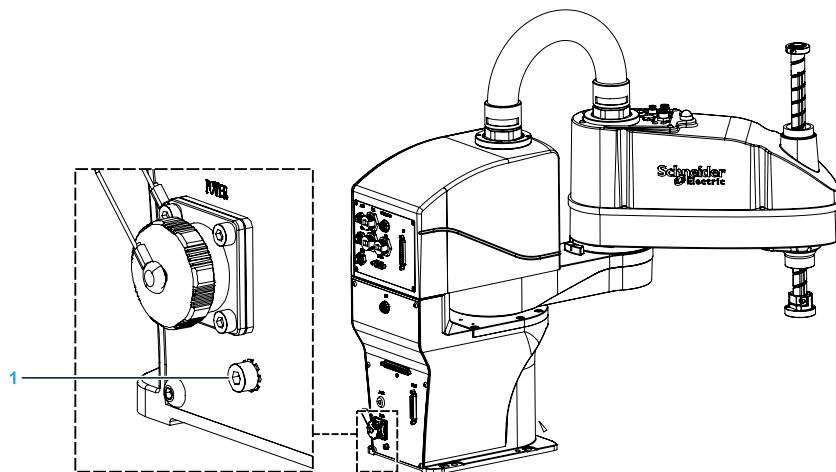
Grounding the Robot

Grounding the Robot

Feed and fasten the protective ground (earth) cable to the protective ground (earth) connection (1) of the robot housing. Use a wire of minimum 1.5 mm². The ground connection is marked with the following symbol:



NOTE: For the specifics of the requirement of the ground wire, follow the local standards and applicable regulations for a protective ground (earth).



⚠ DANGER

ELECTRIC SHOCK DUE TO IMPROPER GROUNDING

Ground robot components in accordance with local, regional and/or national standards and regulations at a single, central point.

Failure to follow these instructions will result in death or serious injury.

Multipoint grounding is permissible if connections are made to an equipotential ground plane dimensioned to help avoid cable shield damage in the event of power system short-circuit currents.

Local Standards and Regulations

For the specifics of the requirement of the ground wire, refer to the following local standards and regulations.

Nation	Standard
China	GB/T 5226.1
EU	EN 60204-1
England	BS EN 60204-1
US	UL 1740
Canada	CAN/CSA-Z434-14

Cabling the Robot

Overview

DANGER

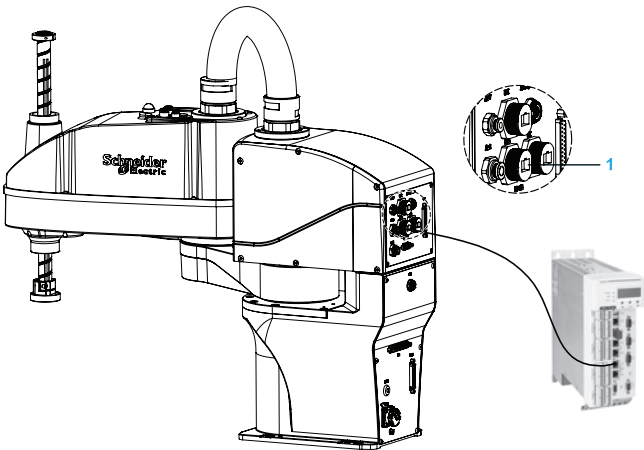
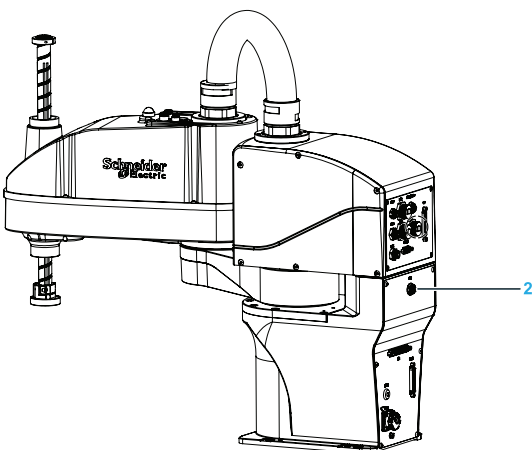
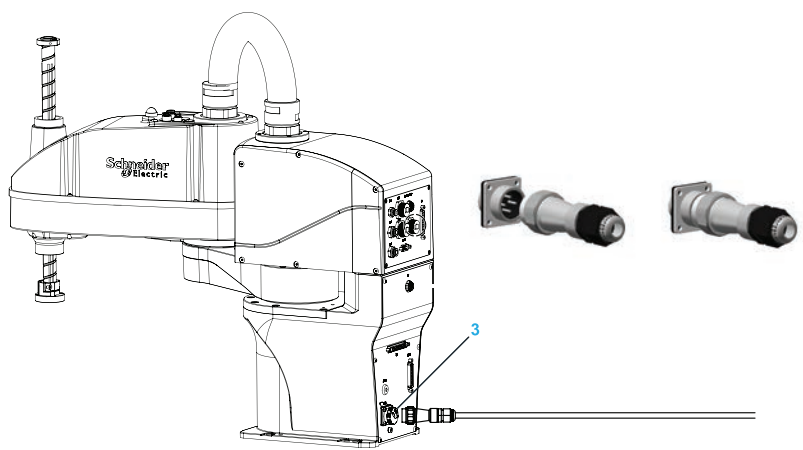
ELECTRIC SHOCK

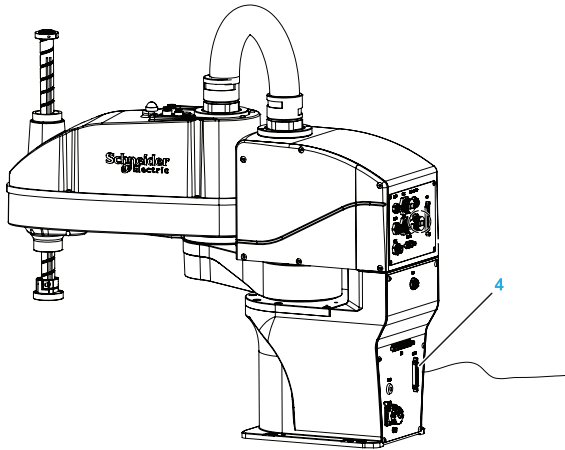
- After switching off the equipment make sure to maintain a waiting time of at least 5 minutes before disconnecting the power cable for the capacitors to discharge.
- Always use a properly rated voltage sensing device to confirm that the power is off where and when indicated.
- Turn off the power and disconnect from the power source while wiring power cables and use lockout devices, tags and/or clearly stated labels to help prevent the inadvertent powering of the mains power while wiring the power cables.
- Ensure that the connector is turned clockwise and is securely fastened.
- Provide only the specified AC power to the robot.

Failure to follow these instructions will result in death or serious injury.

Cabling the Robot

To cable the Lexium SCARA according to the system architecture with a PacDrive controller, perform the following steps:

Step	Action
1	Connect the communication connector to the Sercos port RTN1 or RTN2 (1) at the robot. 
2	Verify that the jumper plug at the MCP connector (2) is connected. NOTE: Out of the factory shipment, the robot is delivered with a jumper plug at the MCP connector. It must be connected to move the Lexium SCARA joints. 
3	Connect the power supply cable to the POWER connector (3) at the back of the robot. 
4	Turn the connector of the power cable clockwise to tighten it.

Step	Action
5	Connect the D-Sub44 connector of the Cable_SAFETY cable to the SAFETY connector at the robot base (4) and the open end of the cable to the functional safety circuit of the machine.  The diagram shows a side view of a robot base. A cable is connected to a port on the base, which is labeled with the number 4. The cable is labeled 'Cable_SAFETY'. For further information on wiring, refer to Emergency Stop Connector (SAFETY), page 48.
6	Verify the correct routing and fastening of the cables to help prevent any collision of cables and moving parts.

Functional Safety

General Information

The Lexium SCARA provides emergency stop safety functions (SF) that have been designed and tested for functional safety in accordance with the following standards:

- IEC 60204-1
- ISO 13849-1

Process for Minimizing Risks Associated with the Lexium SCARA

General

The goal of designing machines safely is to protect people. The risk associated with electrically controlled robots comes chiefly from moving machine parts and electricity itself. Only you, the user, machine builder, or system integrator can be aware of all the conditions and factors realized in the design of your application for the robot. Therefore, only you can determine the robotic equipment and the related safeties and interlocks which can be properly used, and validate such usage.

Hazard and Risk Analysis

Based on the system configuration and utilization, a hazard and risk analysis must be carried out for the system (for example, according to ISO 12100 or ISO 13849-1). The results of this analysis must be considered when designing the system, and subsequently applying safety-related equipment and safety-related functions. The results of your analysis may deviate from any application examples contained in the present or related documentation. For example, additional safety components may be required. In principle, the results from the hazard and risk analysis have priority.

⚠ WARNING

NON-CONFORMANCE TO SAFETY FUNCTION REQUIREMENTS

- Specify the requirements and/or measures to be implemented in the risk analysis you perform.
- Verify that your safety-related application complies to applicable local regulations and standards.
- Make certain that appropriate procedures and measures (according to applicable sector standards) have been established to help avoid hazardous situations when operating the robot.
- Use appropriate safety interlocks where personnel and/or equipment hazards exist.
- Validate the overall safety-related function and thoroughly test the application.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The ISO 13849-1 *Safety of machinery - Safety-related parts of control systems - Part 1: General principle for design* describes an iterative process for the selection and design of safety-related parts of controllers to reduce the risk to the system to a reasonable degree. To perform risk assessment and risk minimization according to ISO 12100, proceed as follows:

1. Defining the boundary of the system.
2. Identifying risks associated with the system.
3. Assessing risks.
4. Evaluating risks.
5. Minimizing risks by:
 - Intrinsically safe design
 - Protective devices
 - User information (see ISO 12100)

Additional information is available on www.se.com.

Emergency Stop Safety Functions

Stop Function Categories

The following table presents the stop function categories according to IEC 60204-1 that are related to the product:

Stop function category	Definition	Corresponds to
0	Stopping by immediate removal of power to the machine actuators (for example, an uncontrolled stop).	An uncontrolled stop (stopping of machine motion by removing electrical power to the machine actuators).
1	A controlled stop with power available to the machine actuators to achieve the stop and then removal of power when the stop is achieved.	A controlled stop (stopping of machine motion with power to the machine actuators maintained during the stopping process).

Functional Description

The following emergency stop options can be implemented with the Lexium SCARA:

- Stop category 0

If the Lexium SCARA detects an emergency stop signal at the **SAFETY** connector, this results in a stop category 0.

- Stop category 1

The stop category 1 can be achieved by using an external safety monitor with delayed relay outputs. The undelayed emergency stop signal is wired to the PacDrive controller, which performs the controlled stop. The delayed emergency stop signal is wired to the Lexium SCARA **SAFETY** connector and disables the Lexium SCARA (final switch off). See the wiring example with safety module XPSUAT•3A3A• in Emergency Stop Connector (**SAFETY**), page 48.

Diagnostic

The Lexium SCARA monitors the status of the safety-related inputs. If a signal is detected, the Lexium SCARA system performs a category 0 stop and removes the power. The corresponding diagnostic messages are sent to the PacDrive controller via Sercos.

Initial Start-Up

Parametrization of the Robot Mechanics

Parametrization of the Robot Mechanics with the SchneiderElectricRobotics Library

Use the `SchneiderElectricRobotics` library for operating the Lexium SCARA. The `SchneiderElectricRobotics` library facilitates the parametrization.

For further information about using the `SchneiderElectricRobotics` library, refer to *SchneiderElectricRobotics Library Guide* in the EcoStruxure Automation Expert - Motion or EcoStruxure Machine Expert online help.

Manual Parametrization of the Robot Mechanics

Depending on the application, individual values may or must be adapted or optimized. This is done with the parameters for the payload, the path, the permissible tracking deviation, and other relevant parameters.

Setting the Monitoring

Operating Library

Use the `SchneiderElectricRobotics` and `RoboticModule` library for operating the Lexium SCARA robot.

Software Limits for Working Area

For the definition of application-specific software limits, refer to EcoStruxure Automation Expert - Motion or EcoStruxure Machine Expert online help.

Testing the Additional Protective Devices

- Verify the emergency stop, any operator protective device, and the releasing of the brakes.
- Comply with the relevant standards, design the protective devices to stop the robot without leaving the path (Safe Stop 1 (SS1)).

Verifying the Monitoring

- Slowly move the robot beyond the limits of the preset working area in order to verify that this is prevented by the preset monitoring.
- Individually move the arms beyond the maximum/minimum angles in order to verify that this is prevented by the preset monitoring.

Start-Up

Overview

When the robot is operated for the first time, there is a risk of unintended equipment operation caused by possible wiring errors, improper mounting and fastening, or unsuitable parameters.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Verify that the robot is properly and firmly fastened.
- Take all necessary measures to ensure that the moving parts of the robot cannot move in an unanticipated way.
- Verify that emergency stop equipment is operational and within reach of the zone of operation.
- Verify that the system is obstacle-free and ready for the movement before starting the system.
- Run initial tests at reduced velocity.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

If the power supply is disabled unintentionally, for example as a result of power outage, the robot is no longer decelerated in a controlled way.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

Verify that movements without braking effect cannot cause injuries or equipment damage.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The temperature on the housing of the Lexium SCARA may exceed 50 °C (122 ° F).

⚠ WARNING

HOT SURFACES

- Avoid unprotected contact with hot surfaces.
- Do not allow flammable or heat-sensitive parts in the immediate vicinity of hot surfaces.
- Verify that the heat dissipation is sufficient by performing a test run under maximum load conditions.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

For further information, refer to [Hot Surfaces](#), page 18.

Commissioning Procedure

Step	Action
1	Verify that the load conforms to the specified payloads for the robot before operating the robot.
2	Verify that the ambient conditions, page 30 conform to the appropriate specified environments for the robot.
3	Perform initial tests at reduced velocity.

NOTE:

- It may be necessary to perform a warm-up cycle before the performance data is obtained.

To perform a warm-up cycle, run the robot at a speed up to 20% of the maximum speed for 10...15 minutes.

The appropriate warm-up procedure depends on the environment. If the environment is cold, the warm-up time may have to be longer. If the environment is warm, the warm-up time may have to be shorter.

- For information about vibrations, contact your local Schneider Electric service representative.
- A high ambient temperature may lead to limitations in the dynamic performance levels of the robot.

Verifying the Firmware Version of the Robot

Overview

To verify the firmware version of the robot, use the **Device Assistant** of **EcoStruxure Automation Expert - Motion** or **EcoStruxure Machine Expert**.

The firmware versions are listed in the **SchneiderElectricRobotics Library Guide**.

The robot firmware is available on www.se.com. To download the firmware, use the **Device Assistant** of **EcoStruxure Automation Expert - Motion** or **EcoStruxure Machine Expert**.

Updating the Firmware of the Robot

To update the firmware of the robot, perform the following steps:

Step	Action
1	Disconnect the PacDrive controller from the Sercos network.
2	Connect the Ethernet port of the PC with the Device Assistant to the Sercos port of the Lexium SCARA and power on the Lexium SCARA.
3	Scan the network, click Update in the context menu of the selected Lexium SCARA, select the new firmware file with the *.fw extension and start the download. Result: The download starts and the progress bar is displayed. The robot status indicator (arm 2) flashes at 5 Hz during the download. When the download is complete, the robot status indicator flashes at 2 Hz. NOTE: Do not power off the Lexium SCARA during the firmware update.
4	Restart the Lexium SCARA by clicking Yes in the dialog or power cycle the Lexium SCARA. Result: The Lexium SCARA restarts and the internal firmware distribution, verification and backup process is performed. The Lexium SCARA restarts automatically two more times before the firmware update is complete. This takes several minutes and the robot status indicator flashes at different frequencies, for details see <i>Robot Status Indicator (Arm 2)</i>, page 44. When the firmware update is complete, the robot status indicator turns off. NOTE: Do not power off the robot during the firmware update. NOTE: If the LED keeps flashing, refer to <i>Troubleshooting</i>, page 81.
5	Verify the firmware version.

Releasing the Joint Brake

Overview

The motors on the axes 3 and 4 are equipped with brakes. The opening of the brakes of axis 3 and 4 may lead to a sagging of the axes.

⚠ WARNING

SAGGING OF THE ROBOT

Ensure that release of the motor brakes of axis 3 and 4 poses no subsequent risks in the zone of operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The load may fall when the brakes are released.

⚠ WARNING

FALLING HEAVY LOAD

Ensure that the robot and the load are independently supported when releasing the brakes.

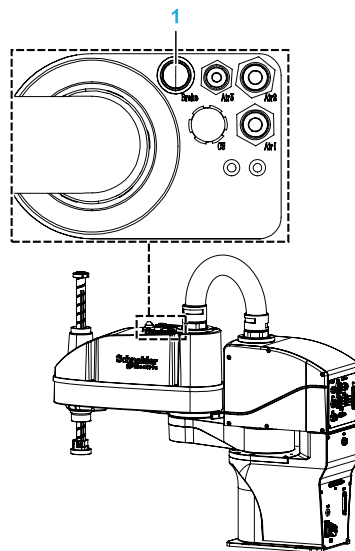
Failure to follow these instructions can result in death, serious injury, or equipment damage.

As precondition, the robot must be connected to the power supply and the application must be ready for use.

When the brake release push-button is pressed, the brakes on axes 3 and 4 are released simultaneously.

Brake release can be used whenever the application is ready for use and the robot has to be moved manually, for example to teach a point in the system.

NOTE: When the robot is not connected to the power supply, the brake release button is without any action.

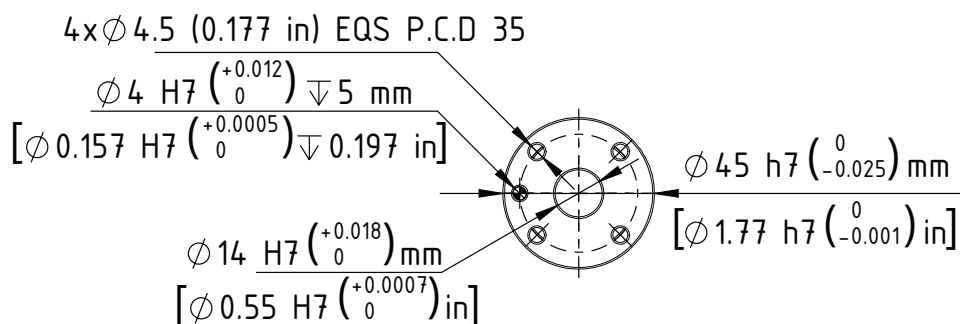
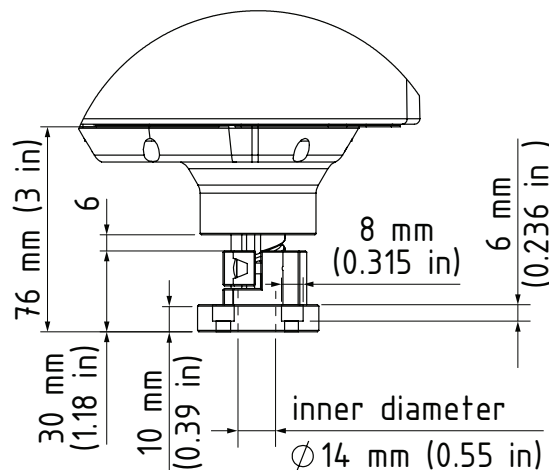


1 Brake release push-button

Mounting the Payload

Mounting the End-Effector

Tool Flange Dimensions



Center of Payload Mass

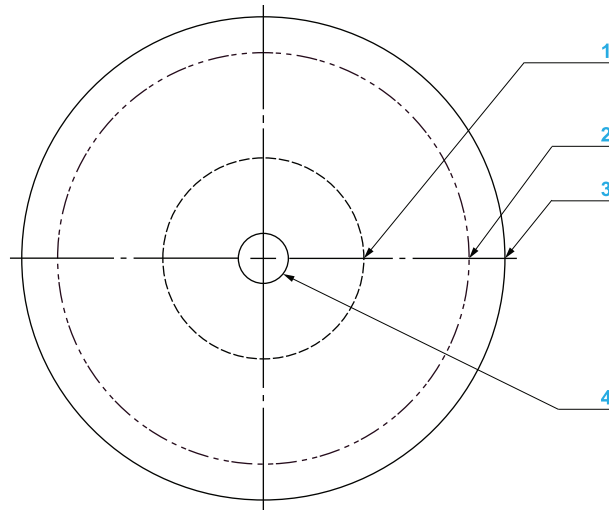
In a typical application the payload may be off-centered relative to joint 4 rotation axis. The following diagram presents the maximum radius of a payload center-of-mass, based on the following setup conditions:

- Rated payload and rated inertia
- Maximum payload and maximum inertia
- Rated payload and maximum inertia

Note that the assumed payload is relatively compact, similar to a point mass.

Calculate the load inertia with the following formula:

load inertia = load mass $\times$ distance from the load center of mass to the center of rotation



- 1** 70 mm (2.76 in) - rated payload (2 kg (4.4 lb) and rated inertia
- 2** 141 mm (5.6 in) - maximum payload (6 kg (13.2 lb) and maximum inertia
- 3** 150 mm (5.9 in) - rated payload (2 kg (4.4 lb) and maximum inertia
- 4** Joint 4 rotation center

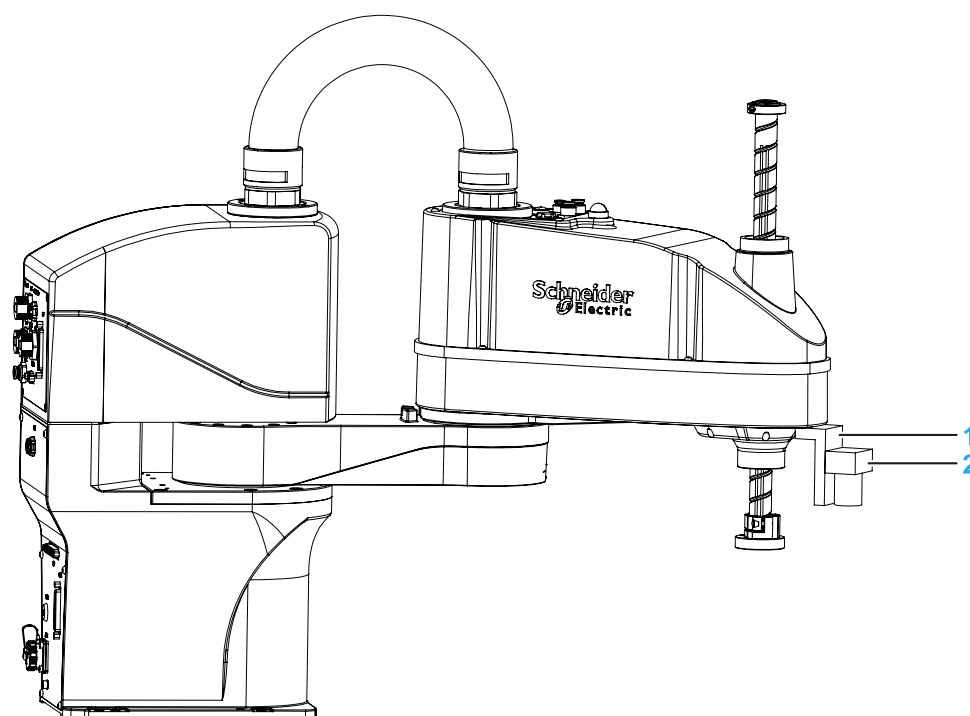
Optional Equipment

Installation of End-of-Arm Camera

Overview

External equipment such as a vision camera, solenoid valve, and so on, can be mounted at the end of the robot arm. Mounting holes are pre-drilled for this purpose. You can design a mounting bracket that meets your specific requirements.

An example of an end-of-arm camera mounting is presented in the following figure.



1 Mounting bracket

2 Camera

M4 mounting screws are not included with the robot.

Maintenance

General Information About Maintenance and Cleaning

Overview

The use and application of the information contained herein require expertise in the design and programming of automated control systems. Only you, the user, machine builder or integrator, can be aware of all the conditions and factors present during installation and setup, operation, repair, and maintenance of the machine or process.

You must also consider any applicable standards and/or regulations with respect to grounding of all equipment. Verify compliance with any safety information, different electrical requirements, and normative standards that apply to your machine or process in the use of this equipment.

DANGER

ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Disconnect all power from all equipment including connected devices prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires except under the specific conditions specified in the appropriate hardware guide for this equipment.
- Always use a properly rated voltage sensing device to confirm that the power is off where and when indicated.
- Replace and secure all covers, accessories, hardware, cables, and wires and confirm that a proper ground connection exists before applying power to the equipment.
- Use only the specified voltage when operating this equipment and any associated products.
- After switching off the equipment make sure to maintain a waiting time of at least 5 minutes before disconnecting the power cable for the capacitors to discharge.
- Operate electrical components only with a connected protective ground (earth) cable.
- Verify the secure connection of the protective ground (earth) cable to the electrical devices so that connection complies with the wiring diagram.
- Do not touch the electrical connection points of the components when the equipment is energized.
- Provide protection against indirect contact.
- Insulate any unused conductors on both ends of the connection cable.
- Ensure that the power cables are correctly connected and connectors are locked in place during the operation time of the system.

Failure to follow these instructions will result in death or serious injury.

Insufficient maintenance can lead to premature wear, or even present potential safety hazards for production or maintenance operators.

WARNING

UNINTENDED EQUIPMENT OPERATION

Develop and follow a maintenance plan and associated protocols adapted to the requirements of your application and equipment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Servicing

In case of issues which cannot be resolved, contact your local Schneider Electric service representative with the following information:

- Type plate information (commercial reference, serial number, technical specifications, date of manufacturing), see [Type Plate](#), page 29.
- Detailed description of the issue
- Previous and associated circumstances

Maintenance Plan

Overview

Regular maintenance verifications are a form of preventive maintenance to keep the robot in good working condition and to help prevent malfunctions. It must be performed by trained maintenance personnel.

The maintenance intervals may have to be adapted to the operational hours depending on the application.

The maintenance intervals must take into account the natural wear and tear based on how you operate the Lexium SCARA.

Maintenance Schedule

Action	Inspection area	Tasks	Inspection interval				
			Daily	1 month	3 months	6 months	12 months
Verify that the air pipes and connectors are not loose.	External air pipes and connectors of the robot	Visually inspect the connectors for loose connections and, if necessary, tighten using a torque wrench with a torque of 1.5 Nm (13 lbf-in). Visually inspect for breakage. Visually inspect for severe bending and air blockage. In case of bending, the air pipe needs to be manually restored to its original position.	√	-	-	-	-
Verify the bolted connections of the robot.	Optional equipment/ accessories assembly bolts Base assembly bolts	Visually inspect for loose assembly bolts on the robot base and the optional equipment/accessories and, if necessary, tighten using a torque wrench with the following torques. - Robot base: 35 Nm (310 lbf-in) - Optional equipment/accessories: 0.6 Nm (5.3 lbf-in)	√	-	-	-	-
Verify that the cable connectors are not loose.	External robot cables	Verify the cable connectors on the interface panel of the robot body for looseness, tangling, pulling, and so on. In case of looseness, re-lock the cable connectors.	√	-	-	-	-
Verify that the ball screw spindle screws are not rusty.	Ball screw spindle	Visually inspect for lack of oil. Visually inspect the screws for rust. If case of irregular noise occurs, contact your local Schneider Electric service representative.	√	-	-	-	-
Verify that the brake is operating properly.	Axis 3 Brake release push-button	Press and hold down the brake release push-button while the robot is under power and verify that the ball screw can move up and down. Verify that the ball screw does not drop due to gravity when the brake release button is unpressed and the robot is turned off.	√	-	-	-	-
Verify the robot by visual inspection for issues Remove dust.	Robot overall	Visually inspect the robot and clean it if dusty ⁽¹⁾ . Visually inspect the cables. If there are scratches, ensure there is no damage such as broken wires.	-	√	-	-	-

Action	Inspection area	Tasks	Inspection interval				
			Daily	1 month	3 months	6 months	12 months
Verify the flexible tube.	Flexible tube	Verify that the clips at the flexible tube connections are fully engaged. Verify the flexible tube manually for unobstructed rotation.	-	√	-	-	-
Verify the condition of the sealings by visual inspection.	Axis 1 and axis 2 Motor/gearbox unit	Visually inspect the motor/gearbox unit for grease leakage.	-	-	√	-	-
Verify the defined home position of the robot.	Robot home position	Verify that the defined home position in the software corresponds to the home position of the robot in the machine.	-	-	√	-	-
Grease the ball-screw.	Ball-screw	Grease the ball-screw with an appropriate grease brush.	-	-	√	-	-
Verify the stability of the various components of the control unit.	Control unit assembly screws	Verify by visual inspection that the anti-loosening marks are properly aligned.	-	-	-	√	-
Verify the stability of the various components of arm 2.	Arm 2 assembly screws	Verify by visual inspection that the anti-loosening marks are properly aligned.	-	-	-	√	-
Verify that the power supply is operating properly.	Controllers	Restart the power supply and verify that the main power indicator (see Base Interface Panel, page 43) is on. Measure the voltage input to the robot with a multimeter. The qualified range is: 100...250 V ac	-	-	-	-	√
Verify the emergency stop and other functional safety devices performance.	Emergency stop Other functional safety devices	While the motor is energized, press the emergency stop button or activate the functional safety devices to verify that the robot stops moving as intended.	-	-	-	-	√
(1) For details, refer to Cleaning, page 80.							

Cleaning

Overview

Only use wipes wetted with a cleaner with 70% Isopropyl alcohol (IPA70).

For painted parts, you can use the suggested cleaner if you wipe softly and without long application. Nevertheless, the repetitive mechanical action of wiping may damage the brightness of the paint.

Highly corrosive detergents are not suitable for cleaning the robot. Do not immerse anodized parts in cleaning solution.

Troubleshooting

Overview

Issue	Probable cause	Solution
Lexium SCARA is not reachable via EcoStruxure Automation Expert - Motion or EcoStruxure Machine Expert.	Lexium SCARA is powered off.	Power on the Lexium SCARA.
	Not connected to the PacDrive controller via Sercos.	Connect the PacDrive controller via Sercos.
	Not connected to the Lexium SCARA controller via Sercos cable.	Verify the connection and functionality of the cable.
Lexium SCARA could not be enabled.	Emergency stop is pressed.	Release the emergency stop button.
Lexium SCARA is not powering on.	Emergency stop is pressed.	Release the emergency stop button.
Lexium SCARA does not accept commands from the controller via Sercos.	Confirmation signal via Auto_On input is missing.	Provide confirmation pulse to Auto_On input.
Emergency stop	Emergency stop is pressed.	Release the emergency stop button.
	No jumper plug is connected to the MCP port.	Connect the jumper plug to the MCP port.
	The Cable_SAFETY is not connected properly.	Verify the connection of the Cable_SAFETY .
Unexpected stop of Lexium SCARA during movement.	Overheating of the Lexium SCARA controller.	Verify that there is sufficient airflow.
Robot status indicator on arm 2 is flashing 5 Hz, 5Hz, 1 Hz.	Indicates a firmware update error. For example, due to an insufficient network communication quality or an unsigned firmware.	Power cycle the Lexium SCARA and try the update again. NOTE: Only use a firmware package signed by Schneider Electric. An unsigned firmware package will be refused.

Appendices

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Further Information About the Manufacturer

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Contact Addresses

Manufacturer

Schneider Electric Industries SAS
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92500 Rueil-Malmaison
France

Other Contacts

See the homepage for additional contact addresses:
Contact Center | Schneider Electric Global (se.com)

Product Training Courses

Product Training Courses

Schneider Electric offers a number of product training courses.

The Schneider Electric training instructors will help you take advantage of the extensive possibilities offered by the system.

Contact your local Schneider Electric representative for more information about potential training.

Disposal

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Disposal

Information on the Disposal of Schneider Electric Products

The robot is delivered on a recyclable pallet. Further packaging comprises cartons and films.

NOTE: The components consist of different materials which can be recycled and must be disposed of separately. Do not return the packaging to the manufacturer.

Dispose of the packaging in accordance with the relevant local, regional or national regulations.

Dispose of the packaging at the disposal sites provided for this purpose.

Dispose of robot in accordance with the applicable local, regional or national regulations.

NOTE: The gearbox units contain lubricants whose disposal may be subject to local, regional, or national regulations apart from the packaging.

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As standards, specifications, and design change from time to time,
please ask for confirmation of the information given in this publication.

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