

SAFETY AND INSTRUCTIONS GARO CEE OUTLETS

Safety information and general instruction manual

GARO AB

Box 203, SE–335 25 Gnosjö
Phone: +46 (0) 370 33 28 00
info@garo.se
garo.se

Manual 380345 1.0

SAFETY INFORMATION AND GENERAL INSTRUCTION MANUAL 3

1. Safety information 3
2. Contact details of the manufacturer 4
3. Storage and transport 4
4. Installation and commissioning 4
5. Operation and maintenance 6
6. Decommissioning and disposal 8
7. General symbol explanation of GARO products 8

SAFETY INFORMATION AND GENERAL INSTRUCTION MANUAL

1. Safety information

1.1. Read this document carefully and completely before installing/ using the GARO equipment.

1.2. This safety information applies to the entire lifecycle of all GARO equipment.

1.3. At the time of initial market placement, all GARO equipment complies with:

1.3.1. The state of the art
1.3.2. The current applicable standards
1.3.3. The relevant harmonisation legislation and regulations to be used in each case
1.3.4. The customer agreement

1.4. Installation may only be carried out by persons (qualified electricians) with the relevant electrical engineering knowledge and experience!

1.4.1. Improper installation can result in a risk to:
- Your own life
- The lives of people using the electrical system

1.4.2. Improper installation can also result in a risk of material damage, e.g. due to fire.
1.4.3. You may be liable for personal injury and material damage.
1.4.4. Please consult a qualified electrician!

1.5. Specialist knowledge required for the installation In particular, the following technical knowledge is necessary:

1.5.1. The "5 safety rules" to be applied
1.5.2. Selection of appropriate tools, measuring equipment and personal protective equipment (PPE)
1.5.3. Evaluation of measurement results
1.5.4. Selection of electrical installation material to ensure the shutdown conditions
1.5.5. IP protection classes
1.5.6. Fitting of the electrical installation material
1.5.7. Type of supply network (TN system, IT system, TT system) and the resulting connection conditions
1.5.8. Compliance with national regulations and requirements
1.5.9. Compliance with GARO manufacturer's specifications found on the website www.garo.se together with relevant operating instructions.

FIVE SAFETY RULES:
Before starting work:

⚠ Disconnect mains!

⚠ Prevent reconnection!

⚠ Test for absence of harmful voltages!

⚠ Ground and short circuit!

⚠ Cover or close of nearby live parts!

1.6. Keep your GARO equipment in a good functional condition by cleaning regularly and servicing as required (see section 5 "Operation and maintenance").

1.7. The following must be ensured in order to prevent personal injury and/or material damage:

1.7.1. Perform installations as prescribed
1.7.2. Use the electrical equipment as prescribed and according to the manufacturer's specifications
1.7.3. Prevent improper use
(e.g. insertion of foreign bodies, attempts to plug into non-complementary sockets, tilting, disconnection without releasing the locking mechanism, etc.)
1.7.4. Use the electrical equipment only under the prescribed ambient conditions
1.7.5. Prevent manipulated electrical equipment from being used
1.7.6. Prevent defective electrical equipment from being used

1.8. Persons, particularly children, who cannot assess the potential risks or can only do so to a limited extent, and animals may be injured during work with the equipment. The equipment is not a toy – keep children and animals away.

1.9. Non-compliance with the safety information and operating instructions, enclosed documents, etc. will void all guarantee, warranty and/or liability claims.

2. Contact details of the manufacturer

GARO AB
Box 203, SE–335 25 Gnosjö
Phone: +46 (0) 370 33 28 00
info@garo.se
www.garo.se

3. Storage and transport

3.1. To ensure subsequent trouble-free use of the electrical equipment, it must be stored in its original packaging, or in a suitable carton, in a dry, dust-free environment.

3.2. The electrical equipment must be transported in its original or equivalent packaging. The electrical equipment must be protected against impact and/or falling.

3.3. Unless deviating storage or transportation temperatures are defined in the product-specific documentation, a minimum temperature of -30°C and a maximum temperature of +50°C apply.

4. Installation and commissioning

4.1. Installation of electrical equipment not yet ready for use may only be carried out by a qualified electrician . The statements in section 1 "Safety information" must be observed at all times!

4.2. Before initial installation and commissioning, the electrical equipment must be checked for possible damage (e.g. damage in transit, corrosion), for completeness and for soiling/contamination. Damaged, dirty or incomplete electrical equipment must never be put to use! This also applies to internal components, such as connecting terminals.

4.3. Also pay attention to correct disposal of the packaging materials.

4.4. In the case of heavy electrical equipment (e.g. large switchgear assemblies), suitable auxiliary devices may be needed under certain circumstances for transport, lifting or support during installation.

4.5. If specific safety information and/or product-specific documentation and/or customer agreements apply to the equipment, then these must be observed.

4.6. The electrical equipment may only be used in the prescribed operating position. Before commissioning, verify that the type/ degree of protection for each piece of electrical equipment is sufficient for the planned operating conditions. In the case of protection class IPX4, marked drainage holes must be opened in the lowest position. Direct exposure to sunlight must be avoided, because it could result in impermissible heating of the electrical equipment or condensation under certain circumstances.

4.7. The altitude of the installation site for the GARO equipment must not be higher than 2000 m above sea level, unless specified otherwise.

4.8. Electrical equipment for surface-mounted and/or flush-mounted installation as well as attachment and/or integration must be fitted using suitable fasteners (e.g. screws and dowels). The electrical equipment may only be secured at the points provided for this purpose. The introduction of additional fastening points not intended for this purpose (e.g. drilled holes) is not permitted. Furthermore, the clearances and creepage distances in conductive housings must be adhered to around breakthroughs.

4.9. Auxiliary materials, such as lubricants (oils, greases, etc.), may not be compatible with the material of the equipment.

4.10. Before installing the GARO equipment, attention must be paid to establishing the correct connection conditions appropriate for the type of supply network (TN system, IT system, TT system).

4.11. To ensure the protection class and strain relief, the GARO equipment may only be used with supplied cable glands and the intended electric cables. If other cable glands are used, ensure that the requirements for protection class and strain relief are met.

4.12. If the GARO equipment is not designed explicitly for aluminium conductors, then only copper cables may be used for installing the GARO equipment. The cable cross-section must be selected according to the power consumption and cable length of the terminal device. The cable type (flexible/rigid) must be selected in accordance with the enclosed documentation and/or GARO manufacturer's specifications on the website (www.garo.se) or catalogue. The design criteria of the GARO equipment must be observed. An excerpt of the connection cross-sections for GARO plugs and sockets is specified in Table 1:

Rated current / Type	Terminal cross section (mm²)	
	wire flexible	wire solid
16A - CEE	1 - 2,5	1 - 4
32A - CEE	2,5 - 6	2,5 - 10
63A - CEE	6 - 16	6 - 25
125A - CEE	16 - 50	16 - 70
16/32A - extra low voltage <50V	1 - 10	1,5 - 10
UIF, UIF-P	1,5 - 2x2,5	1,5 - 2x2,5
PP-, PR-	0,75 - 2,5	–
SSDGL and CRWL	1 - 2,5	–
GSG	1 - 2,5	–

(Table 1): terminal cross section

4.13. The following sheath stripping lengths as per Table 2 (excerpt) must be observed for GARO plugs and sockets. The stripped length of the cable must be fully inserted into the connecting terminal. GARO recommends the use of wire end ferrules. These must be suitable for the cable cross-section and installed according to standards with an appropriate wire stripping length.

Rated current	Dismantling length (mm)	Stripping length (mm)
16A - CEE	50	10 – 12
32A - CEE	50	12 – 14
63A - CEE	100	15 – 18
125A - CEE	100	24 – 27
16/32A - extra low voltage <50V	70	14 – 16
UIF, UIF-P	–	8 – 10
PP-, PR-	30	7
SSDGL and CRWL	30	7
GSG	30	7

(Table 2): Dismantling- and stripping length

4.14. To ensure correct installation of the GARO equipment, screws/ bolts and threaded components must be tightened to the torque specified in the enclosed documentation and/ or in the manufacturer's specifications on the website (www.garo.se) or in the catalogue. An excerpt of the torques for plugs and sockets is specified in Table 3.

CEE plugs and sockets 16A – 125A			Torques in Ncm	
Type	**16 A**	**32 A**	**63 A**	**125 A**
Contact screws (terminal)	100	110	200	450
Pilot contact	–	–	100	100
Connecting screws	–	–	200	200
Housing screws	110	110	200	200
Binding screws	110	110	200	200
Cable gland	500	600	1500	1500

Safety plugs and sockets			Torques in Ncm	
	UIF, UIF-P	PP-, PR-, CRWL	SSDGL	GSG
Contact screws	80	80	80	80
Cable gland	–	110	400	80
Connecting screws	80	110	110*	80
Flanged socket Contact screws	–	–	–	–
Plug/connector Contact screws	–	–	–	–

**model-dependent*

CEE low-voltage plugs and sockets < 50V	(Ncm)
Low-voltage connectors, couplings, wall sockets	
16A/32A contact screw	160
16A/32A cap nut	600
Low-voltage wall-mounted and accessory equipment connectors	
16A/32A contact screw	110

(Table 3): Torques

4.15. Screwless connectors (e.g. screwless terminals, latch systems for fixing housing parts) must be brought to their end positions. The tightness of each connection must be checked.

4.16. In the case of CEE industrial couplings and sockets with pilot contact, attention must be paid to correct installation of the electrical interlocking of the overall system.

4.17. Markings, labels, type plates must not be changed, removed or made illegible.

4.18. After installation and before commissioning/initial operation, a qualified electrician must check the correct function of the electrical equipment.

4.19. If the GARO equipment is installed or commissioned incorrectly, all guarantee, warranty and/or liability claims will be voided.

5. Operation and maintenance

5.1. GARO plugs and sockets are intended for use in industrial plants, commercial enterprises, agricultural facilities, and in households, both indoors and outdoors.The user must ensure that only GARO equipment suitable for the intended operating conditions at the point of use (e.g. network type, IP protection class, operating position, climatic conditions, etc.) is used.

5.2. For areas subject to special requirements (e.g. containers, ports, explosion-proof areas, vehicles, ships, airplanes, data centers etc.), the user must ensure that the equipment meets all the necessary area-specific criteria.

5.3. All GARO equipment must be used in the specified operating position(s).

5.4. GARO equipment is designed for the respective application and resulting mechanical loads. It must not be loaded improperly (e.g. through use as a step, by loading with foreign objects, etc.). In the case of mechanically locked, switched wall sockets, forcible switching on without a plug in place, for example, or forcible pulling of the connector when switched on is not permitted and may result in damage to the electrical equipment.

5.5. GARO equipment is suitable for the following ambient temperatures and must not be exposed to any direct heat sources (e.g. smelting units). To prevent the electrical equipment from overheating, it must not be covered by any objects.

Product group	**Minimum ambient temperature**	**Maximum ambient tempera-ture**	**max. over 24h**
Industrial plugs and sockets	-25°C	+40°C	–
Household plugs and sockets	-5°C -25°C*)	+40°C	+35°C
Low voltage switch gear combinations	see added product documentation		
Extension cords and cable reels - industry	-25°C	+40°C	–
Extension cords and cable reels - household	-5°C	+40°C	+35°C
* for UIF, UIF-P, PP-, PR-, SSDGL and CRWL			

(Table 4): Ambient temperatures, excerpt standards

5.6. Further information (e.g. chemical resistance or UV resistance of the GARO equipment) must be taken from the manufacturer's specifications on the website (www.garo.se) or in the catalogue. GARO equipment may only be used under suitable environmental conditions.

5.7. Damaged electrical equipment must not be used. Particular attention must be paid to kinked or damaged cables.

5.8. Improper use (e.g. pulling the connector at the cable, dropping from a great height, throwing, etc.) is not permitted.

5.9. The GARO equipment must be cleaned on a regular basis to ensure that it operates correctly. The electrical equipment must be disconnected from the mains power supply before cleaning. GARO recommends cleaning with a clean, dry cloth. Should cleaning agents be used, the user must first ensure that the cleaning agent used is compatible with the GARO equipment (see also section 5.6).

5.10. GARO equipment must be serviced and inspected for damage at regular intervals, in accordance with the relevant national legal regulations and provisions of the country of use and depending on the actual application. This also includes checking the tightening torques of all threaded connections.

5.11. In order to minimise wear of connectors and sockets, we recommend that electrical consumers be unplugged/ disconnected when switched off.

5.12. If the GARO equipment in question is fitted with a fault-current circuit breaker (e.g. various versions of switchgear assembly), then the function of the circuit breaker must be checked every six months using the test button. Shorter test intervals may also be prescribed (e.g. every working day in building site areas), depending on the make and application.

5.13. If the GARO equipment in question is fitted with fuses, then the equipment must be assumed to be defective if operation is interrupted by tripped fuses. A qualified electrician must be assigned to rectify the fault.

5.14. If the GARO equipment is fitted with window flaps for switchgear, etc., then the window flaps must always be completely closed after actuation of the underlying switchgear, etc. The protection class specified on the type plate is only guaranteed with correctly closed window flaps.

5.15. If the system allows connectors of a certain IP protection class to be inserted in plugs of another IP protection class, then the fact that the resulting IP protection class of the connector/socket combination corresponds to the lower of the two must be taken into account.

5.16. Any use of the GARO equipment going beyond use for the intended purpose will void all guarantee, warranty and/or liability claims.

6. Decommissioning and disposal

6.1. The electrical equipment must be disconnected from the power supply before decommissioning and disposal. The 5 safety rules (see section 1.5) must be observed prior to uninstalling.

6.2. The relevant, valid national legal regulations and provisions of the country of use must be observed for disposal.

6.3. Waste Electrical and Electronic Equipment (WEEE) Directive: According to European regulations, used electrical and electronic devices (equipment) may no longer be disposed of in unsorted waste. The symbol of the crossed-out wheeled bin indicates the necessity for separate collection.

7. General symbol explanation of GARO products

symbol	explanation
	The labeled equipment must not be disposed of with household waste.
	Observe the safety information and general operating instructions.
	A qualified electrician is a person who is authorized to perform and supervise electrical work.
	The CE mark is an indication that all EU-wide requirements have been met.
	The UKCA mark indicates that all requirements for the United Kingdom are met.
	Angled plugs, adapter plugs or plug devices may only be plugged into marked protective contact sockets with a sealing bulge.
	The marked equipment must not be plugged in one after the other because of the danger of overheating.
	The marked equipment must not be covered because of the risk of overheating.
	Protective contact plugs and sockets for serve conditions
	Use the marked equipment indoors and only temporarily outdoors.
	Use the marked equipment in dry rooms.
	The fully wound cable drum may be operated with maximum xxxx watt loads.
	The fully unwound cable drum may be operated with maximum xxxx watt loads.
	The marked equipment cable reel is to be used upright.
	Switch disconnector: Switching mixed resistive and inductive load including moderate overload. (eg: AC22A)
	In the case of sockets that can be switched off and are mechanically interlocked, unplugging is only possible when the device is switched off.
	Sockets that can be switched off and mechanically interlocked can only be switched on when fully plugged in.
	Indicates that the assembly is protected against cold and suitable for use at temperatures down to minus 25°C.
	Protective insulation, protection class II The marked equipment is double insulated.
	The marked equipment must not be plugged into fixed sockets.
	The marked equipment must not be operated in an explosive atmosphere.
	Operating equipment for high mechanical, physical or chemical impacts.

(Table 5): Symbol explanation

GARO AB
Box 203, SE–335 25 Gnosjö
Phone: +46 (0) 370 33 28 00
info@garo.se
garo.se