Contents

1 Subject of specification 2
2 Scope of validity 2
2.1 Deviations 2
3 Hierarchy of documents 2
4 Definition and designations 2
4.1 Definitions 2
5 Description 3
5.1 Ambient conditions 3
5.2 Electric supply system data 4
5.3 Basic design requirements 4
5.3.3 Technical requirements 5
5.3.4 Repair socket-outlets, single, 16, 32, 63A respectively 5
5.4 Assembly of repair Ex socket-outlets sets 6
5.4.1 Technical requirements 6
6 Technical requirements 7
7 Relevant documents 7
8 Codes and standards 7
9. Record of changes 8

This document is the property of LOTOS Group SA.. Copiyng and giving it to other is forbidden without express written authority by LOTOS Group SA

1 Subject of specification

This specification used in conjunction with other technical specifications of LOTOS Group S.A., establishes minimal requirements regarding designing and manufacture of repair socket-outlets' systems.

2 Scope of validity

This specification shall be used when preparing both quotations and Purchase Orders concerning planned LOTOS Group S.A. new investments and modernizations.

It shall also be a base for preparation of other detailed specifications and quotations relevant for package units or other equipment deliveries.

The Contractor is independently responsible for selection of equipment and materials to be purchased on the basis of technical design particularly in relation to instruments and equipment made in explosion – proof execution.

2.1 Deviations

Any deviation from this specification and the relevant specifications, standards and related documents including proposals, which the bidder claims to be economically and / or technically superior solutions must be submitted in writing for review and approval by Grupa LOTOS SA. Non-approved exceptions are not acceptable by Grupa Lotos S.A.

The supplier must report in writing any ambiguity in this or any other specifications of Grupa LOTOS SA or non-compliance with the referred documents / standards and obtain a written explanation from Grupa Lotos SA.

3 Hierarchy of documents

In case of conflicts existing between this specification and other documents, the following order of precedence shall govern:

- The current Polish legislation
- Terms of purchase order/contract and other requirements agreed in writing with GL SA
- Data Sheets approved by GL SA
- This Specification
- Other Specifications
- Drawings and other documents
- Standards

4 Definition and designations

CONTRACTOR: GL SA LOTOS Group Inc./ BUYER

SUPPLIER: BIDDER/ DELIVERER

4.1 Designations

GL SA LOTOS Group S.A.

MV – medium voltage

LV – low voltage

AC – alternate current

DC – direct current

EMC – ElectroMagnetic Compatibility

Shall – Indicate a mandatory requirement

5 Description

5.1 Ambient conditions

- Atmosphere — marine, aggressive industrial, chemical and dusty
- Ambient temperature (max/min) — +36°C/-25 °C
- Relative humidity (max/min) — 90%/70%
- Elevation above sea level — 1m
- Wind speed — 26 m/s
- Snow falls — 290mm
- Work conditions — refinery, sea coast

5.2 Electric supply system data

▪ Low voltage	400V, TN-S with +/-10% allowable tolerance
▪ Low voltage (lighting, heating)	230V, 1-phase,TN-S
▪ Low voltage (emergency lighting)	110V DC
▪ Direct current control voltage	24V, 110V DC. 220V DC (for GPZ1,S7 and S9)
▪ Alternate current control voltage	230V, 1-phase
▪ Frequency	50Hz with +4%/-6% allowable tolerance

5.3 Basic design requirements

5.3.1. Documentation

Listed below documents shall be submit to GL SA for approval:

- document list,
- operation manual,
- dimension drawing,
- spreadsheet fulfilled by Supplier,
- one line diagram,
- equipment location drawings
- wiring diagrams,
- list of equipment,
- spare part lists
- certificates
- EMC declaration
- Declaration of conformity
- mounting details, manuals

5.3.2. Basic requirements

For all used equipment is require reliability, smooth operation and ease of use. A typical apparatus shall be used. It is not allowed to use prototype devices, non-registered devices and devices which are not into production. Spare parts shall be available for a minimum of 10 years. Name plate shall comply with the equipment the rated at continuous operation of these devices in certain (indicated) conditions.

The nominal parameters of equipment shall comply working requirements at rated voltage and rated currents for all uses, voltage tolerance ± 10%.

Socket outlet set shall comply requirements of the EMC Directive, that means that it should work correctly in a specified electromagnetic environment without introducing additional electromagnetic disturbances.

5.3.3 Technical requirements

- For purposes of electrical equipment supply during repairs, sets of repair socket-outlets shall be used, equipped with:
  - 4-pole main disconnector switch, 80 A explosion-proof (for devices located in Ex-zone)
  - 1-phase, 16A , 1-pole socket-outlet, according to European system,
  - 3-phase 16A socket-outlet,3 pole, industrial type (non-Ex)
  - 3-phase 32A socket-outlet, 3 pole, industrial type (non-Ex)

    3-phase 63A socket-outlet, 3 pole, industrial type (non-Ex)
  - residual current-operated circuit-braker (RCCB) 63A, 30 mA
  - residual current-operated circuit-braker (RCCB) C16A, C32A, C63A,
  - Pilot lamp red colour (voltage signalling)
- Enclosure and main disconnector switch shall be of explosion-proof design, certified for operation on Zone 1, restricted to the socket outlet industry type, non-Ex.
- Main disconnector switch, enabling locking with padlock in „OFF" position.
- Enclosures made of plastics shall have impact resistance better than 7Nm, dielectric strength better than 2kV, surface resistance below $10^9\Omega$, and shall be resistant to influence of aggressive chemicals, such as acids, lye, bases, salts, oils and greases.
- Cable glands glands and hole plugs made of plastic shall be fire resistant and self-extinguishing.
- The supplier of Ex equipment is responsible for selection of adequate cable glands, on the base of cable data provided together with data sheets for Ex equipment.
- Cable glands for armoured cables – made of brass or nickel plated, suitable for cables armoured with round steel wires, screwed in from bottom side of enclosure to brass plate, connected with earthing PE terminal by means of yellow-green 2.5 mm^2 copper strand. Cable glands for non-reinforced cables – made of metal or plastic, suitable for PVC insulated cables with gaskets fitted to diameter of external cable jacket.
- Reliability, smooth operation and easy handling are required for all equipment applied. Typical equipment shall be used. Application of prototype equipment, not registered and not admitted for production is forbidden.
- Rated data for equipment shall correspond to continuous operation rated data of the equipment, at specified (previously given) working conditions.
- Socket outlets shall be made accordingly diagram – attachment 1 (Wiring diagram of repair socket outlet 80A)

5.3.4 Repair socket-outlets, single, 16, 32, 63A respectively

Single repair socket outlet (16.32.63A) are used , , if is required to periodical supply of mobile Ex equipment during normal plant operation. The socket-outlets shall Ex-proof II2G Ex de IIC T4 be

certified for operation in Zone 1. Sockets outlets shall be able to disconnect circuit only when they are not energized.

5.4 Assembly of repair Ex socket-outlets sets

Repair socket outlets sets shall be shall be agreed with GL SA.

It is necessary to foreseen such location of repair socket outlets sets, so that for assumed reach of receiving cable 30 m, supplying of consumer located within process plant boundaries would be possible.

5.4.1 Technical requirements

- Explosion protection: II2G ; EEx de IIC T4
- Rated voltage 230V AC – for 3-pole, sine-phase sockets 400V AC – for 5-pole sockets
- Rated current 16A, 32A and 63A AC, respectively
- Socket outlets requirements described in point 4.3.3
- Degree of protection IP 56, minimum
-

5.5 Local Repair Panel for high power consumers like VOMA pumps, construction switchgears, socket outlet

For supply:

- VOMA pumps
- cutting devices
- repair switchgear
- other equipment above 30kW

Electrical distribution junction box or connecting box shall be made as EX-proof equipped with busbar connection L1,l2,L3,N,PE .Current carrying capacity shall be sufficient to connect a load to 160kW.

During normal operation of the process installation repair socket outlets are switched off. Terms of use Local Repair Panel regulates the supply of temporary electricity consumers in the GLSA procedure.

5.5.1. Technical requirements

- Ex proof type II2G Ex e II T4
- rated voltage 400VAC
- Power consumption 160kW
- Busbar connection L1,L2,L3,N,PE
  with special Connectors for flexible cable connections
- On supply side (in substation) short circuit breker with residual-current part
- Degree of protection IP56
- Cable clands for supply cable with protection cover

6 Relevant documents

- **Ot**her Technical Specifications, shown on delivered List of Technical Specifications for GL S.A

7 Codes and standards

Repair socket-outlets along with accessories shall fulfil requirements of Polish Norms and standards listed below, as well as their European equivalents IEC, ISO/CENELEC:

▪ PN EN 60309-1	Socket-outlets and plugs for industrial purposes. General requirements.
▪ PN EN 60309-2	Socket-outlets and plugs for industrial purposes. Dimensional interchangeability requirements for pin and contact-tube accessories.
▪ PN-EN 60529	Degrees of protection provided by enclosures (IP Code).
▪ PN-EN 60079-0	Electric equipment in explosion hazard zones. Part 0. General requirements.
▪ PN-EN 60079-1	Electric equipment in explosion hazard zones. Part 1. Flameproof enclosures „d”.
▪ PN-EN 60079-7	Electric equipment in explosion hazard zones. Part 7. Increased safety „e”

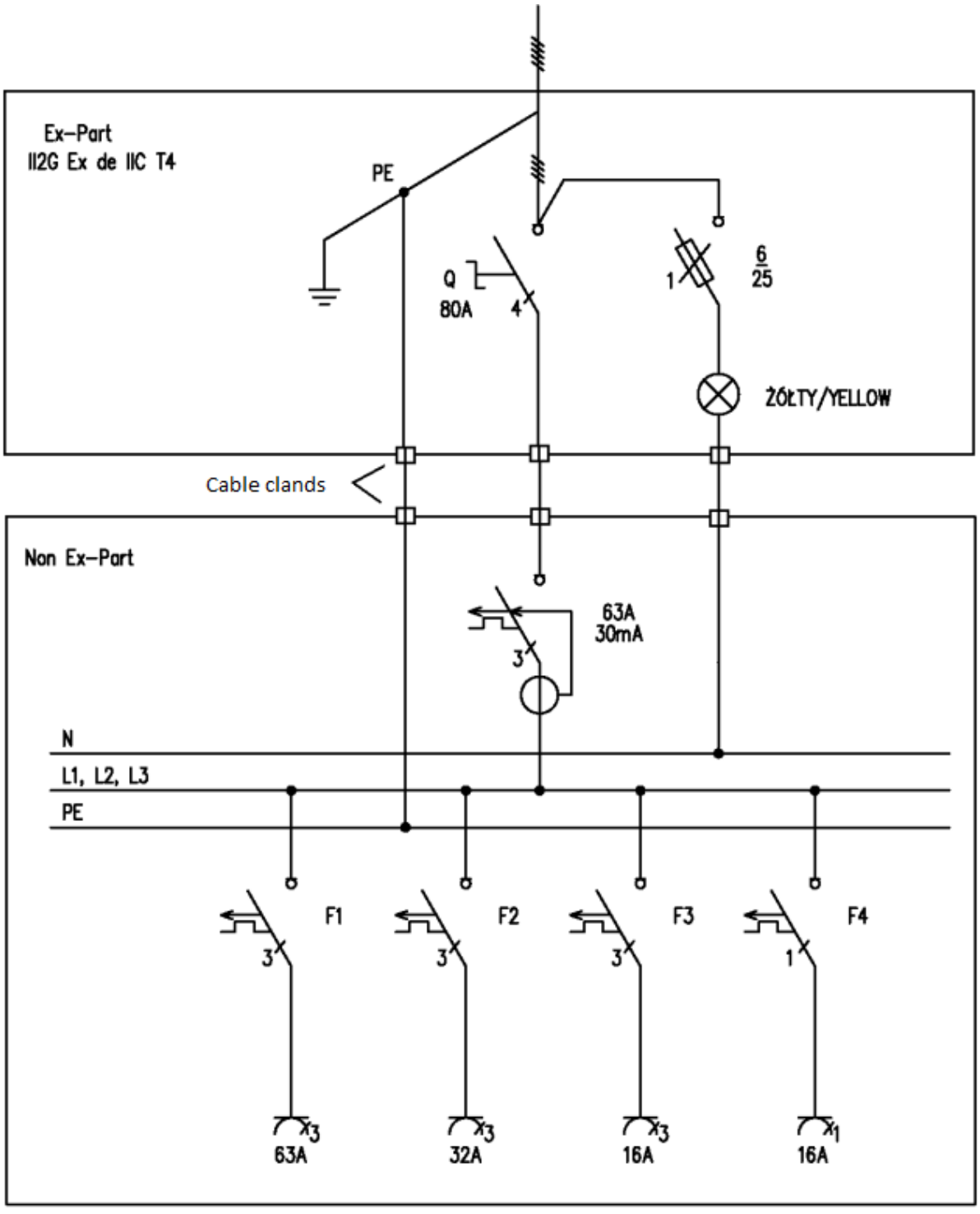
Socket outlets prepared base on different codes or standards shall be submitted to the GL SA for acceptance.

8. Record of changes

No.	Date	Description	Introduced by
0		This specification entirely replaces the former LOTOS Group S.A. standard No. PR 07 422 with the same title.	J. Bućko
1	30-11-2013 (rev.1)	Review, update, standardize and changes to the Standard within scope of order No. OK/990/2012	Editorial board coordinated by T.Wróbel
-	31-08-2015	Page layout corrections, no content changes.	T. Wróbel

8 Attachment 1

Wiring diagram of repair socket outlet 80A.


Ex–Part
II2G Ex de IIC T4
PE
Q
80A
4
1
6
25
ŻÓŁTY/YELLOW
Cable clands
Non Ex–Part
63A
30mA
3
N
L1, L2, L3
PE
F1
F2
F3
F4
3
3
3
1
3
3
3
1
63A
32A
16A
16A