

GRDC-4200

Electronic capacitive earthing system 'Ex eb / tb'

- Zone 1, 2, 21, 22
- High quality electronic components
- Aluminium or polyester casing
- High resistance to corrosion and extreme weather
- Safe and reliable over time
- Marking with one or two earthing pliers

*Polyester coating
RAL 7035*

Connection pliers

Selector switch

*8m connection cable
(extended)*



GRDC-4200 Capacitive electronic earthing system 'Ex eb / tb'

The GRDC-4200 is a capacitive-type electronic earthing system that ensures earthing of tankers, rail tankers and IBCs (intermediate bulk containers) when transporting flammable liquids such as fuels, chemicals, powders and granulates.

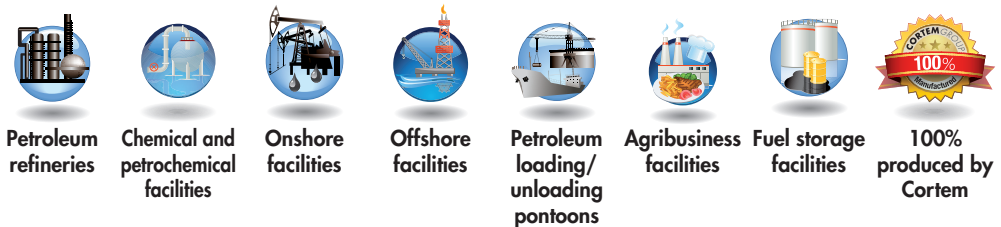
The system analyses the overall capacitance of the vehicle, to provide consent for load activation, only in the case of actual connection. Thanks to the electrical capacitance reading of the connected device, the GRDC-4200 can distinguish whether it has been connected to the tank or to another metal object (pipe, ladder, etc.), thereby increasing the level of reliability and safety and preventing possible misuse by the operator. During the whole loading and unloading phase, the device checks that the earthing system remains equipotential via the connection of earthing pliers.

The GRDC-4200 consists of a Cortem Ex eb/tb casing containing ATEX/IECEx-certified earthing control logic, Cortem Ex eb/tb control and signalling devices such as selector switches and LED indicators, and one or more earthing pliers for connecting to tankers or other metal parts.

Cortem Group applies a tamper-evident holographic security label to its products, complete with a unique authentication numeric code, to combat the illegal sale of imitations and counterfeits, as well as guarantee the authenticity of its products. Failure to observe international standards creates serious risks for the environment and, above all, for the personnel who work with the systems on a daily basis.



Sectors of application:



CERTIFICATE DATA

Classification:	Group II	Category 2GD		
Installation: EN 60079.14	zone 1 - zone 2 (Gas)	zone 21 - zone 22 (Dust)		
Marking:	CE 0722 Ex II 2GD - Ex db eb mb [ia Ga] IIC T... Gb - Ex tb [ia Da] IIIC T...°C Db			
Certificate:	ATEX	CML 20 ATEX 3235X		
	IEC Ex	IECEx CML 20.0144X	For all IEC Ex, UKEX certificate data, download the certificate from www.cortemgroup.com	
	UKEX	AVAILABLE		
Standards:	CENELEC EN 60079-0: 2018, EN 60079-1: 2014, EN 60079-7: 2015+A1:2018, EN 60079-11: 2012, EN 60079-18: 2015+A1:2017, EN 60079-31: 2014, EN 60529: 1991 and European Directive 2014/34/EU. IEC 60079-0: 2017, IEC 60079-1: 2014-06, IEC 60079-7: 2015, IEC 60079-11: 2011, IEC 60079-18: 2017, IEC 60079-31: 2013, IEC 60529: 2001. RoHS Directive 2002/95/EC.			
Temperature class:	85°C (T6)	85°C (T5)	85°C (T4)	
Ambient temperature:	-40°C +40°C	-40°C +50°C	-40°C +60°C	
Degree of protection:	IP66			

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MECHANICAL FEATURES

GRDC-4200..

Body and lid:	Low copper content aluminium alloy
Resistant to knocks:	IK10
Gasket:	Acid, hydrocarbon and high temperature resistant silicone positioned between the body and the lid
Certificate label:	Adhesive
Screws, bolts and nuts:	Stainless steel, captive type
Earthing screw:	Stainless steel. Inside and outside the body, complete with anti-rotation brackets
Mounting:	Cast aluminium feet for M6 screws
Coating:	Polyester RAL 7035 (Light grey)

Resistenza alla corrosione:

The STANDARD of the aluminium alloy used by Cortem has passed the tests required by the Standard EN60068-2-30 (hot-humid cycles) and EN60068-2-11 (salt fog test)

GRDC-4200..P..

Body and lid:	Black polyester resin with antistatic properties
Resistant to knocks:	IK10
Gasket:	Acid, hydrocarbon and high temperature resistant silicone positioned between the body and the lid
Mounting:	Polyester feet for M6 screws
Certificate label:	Adhesive
Screws, bolts and nuts:	Stainless steel, captive type

Pliers:	Bipolar, casting with aluminium with handles in neoprene, jaws with steel tips, auto-releasing. 16 mm opening.
Spiral cable:	Yellow with trim in rubber resistant to oil and chemical substances. Suitable for extremely high mechanical stresses. Length 8 m (extended).
Bracket for pliers:	In stainless steel.
Selector switch:	In aluminium with black anodic oxidation.
Indicator light:	Green polycarbonate.



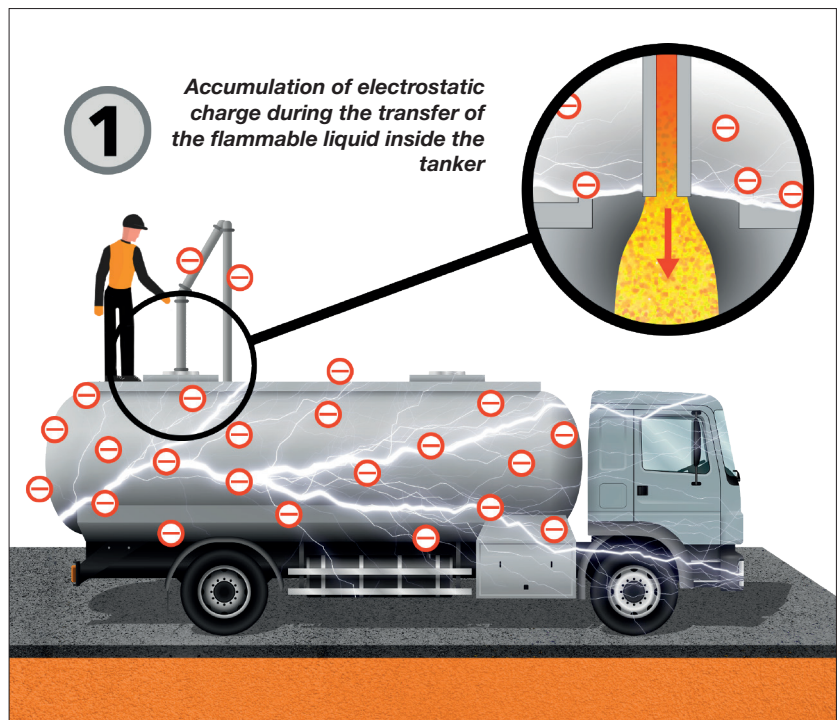
ACCESSORIES UPON REQUEST / SPECIAL REQUESTS

- Cable gland
- Body and lid in stainless steel AISI 316L

Operation of the capacitive earthing system in Ex environments

The GRDC earthing system is designed to prevent the accumulation of electrostatic charges generated during loading and unloading from transport vehicles containing flammable and explosive liquid (e.g. fuels) or solid (e.g. coal, flour) products.

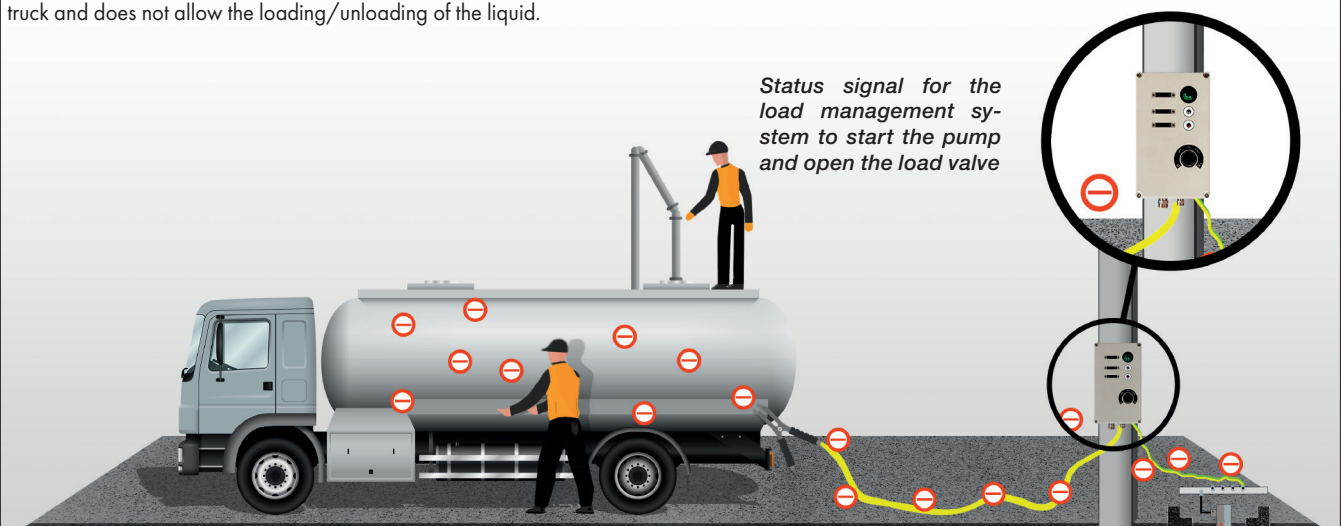
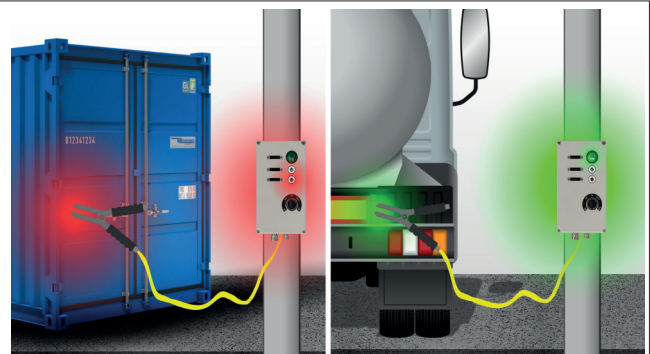
An earthing connection between the tanker truck and the earthing network of the system is not enough to prevent the generation of sparks. A series of safety measures must be taken to connect the two systems safely, ensuring the safety of people and the protection of property. These systems are commonly referred to as "earthing systems" and operate on the principle of equipotential bonding of metallic conducting and semiconducting objects present during loading or unloading of potentially explosive products.



This system, known as a capacitive earthing system, differs from the resistive type system (Cortem Product code GRDE) in terms of its ability to distinguish a tanker from a simple metal component (e.g. a tank cage, a container). This is necessary in order to ensure maximum safety, also in the event of a possible error or misuse by the operator who, by connecting the pliers to a simple metal part, can obtain consent from the resistive-type earthing system causing them to proceed with unsafe loading/unloading operations.

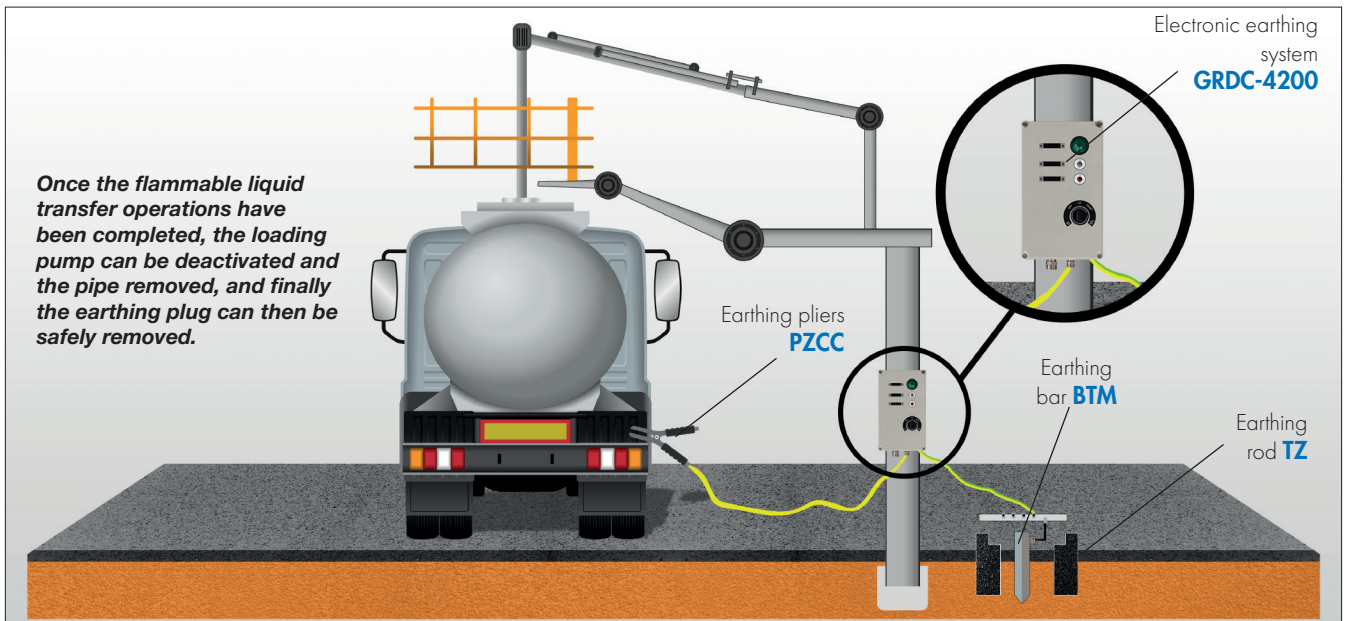
In fact, a resistive earthing system only checks that the pliers are connected to a component with good conductivity (low resistance) and that the resistance between ground and the component connected to the earthing pliers is below a certain limit.

Therefore, with a capacitive earthing system, if an operator connects the pliers to a simple metal element it recognises that it is not connected to a tanker truck and does not allow the loading/unloading of the liquid.



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This system consists of a earthing control logic called PCBLCZ-4200 which, protected by the 'Ex mb' protection mode, not only monitors the parameters of the earth connection, but also has an intersectional safety barrier 'Ex ia' which ensures engagement of the pliers for safe earth connection. Furthermore, thanks to this logic, in addition to enabling the connection to ground in order to remove electrostatic charges from the tanker truck, tanker, etc., the GRDC system can also be used to enable the switching on of the loading/unloading pump through the use of a double contact relay. This way, in the unfortunate event that the ground connection fails, the flammable liquid loading/unloading operation is immediately stopped in complete safety until the connection to ground is restored. The GRDC system can be supplied with one or two earthing pliers for simultaneous connection of several tankers.



Operating guide

STEP 1

Switch on - Automatic check of the earth resistance connection

Set the selector switch from OFF to ON

- Positive result - yellow indicator light stops flashing after 5 seconds
- Negative result - continuous yellow indicator light flashes waiting for the earth connection to improve

STEP 2

Earthing pliers connection - Capacitive load control

After having connected the pliers to the tank:

- there is a capacitance to ground greater than the pre-set value, the white indicator light turns on giving the consent to STEP 3
- correct capacitive load to ground is not present (connect the pliers to a different metal object), white indicator light off, access to STEP 3 not permitted.

STEP 3

Electrostatic current discharge - Enabling or stopping the operation

- Once the correct earthing is verified, by turning and holding the switch in the START position for 2-3 seconds, the green indicator light turns on and the internal logic checks that the impedance value does not exceed 10Ω for the duration of the operation, thereby enabling or stopping the operation via a relay.

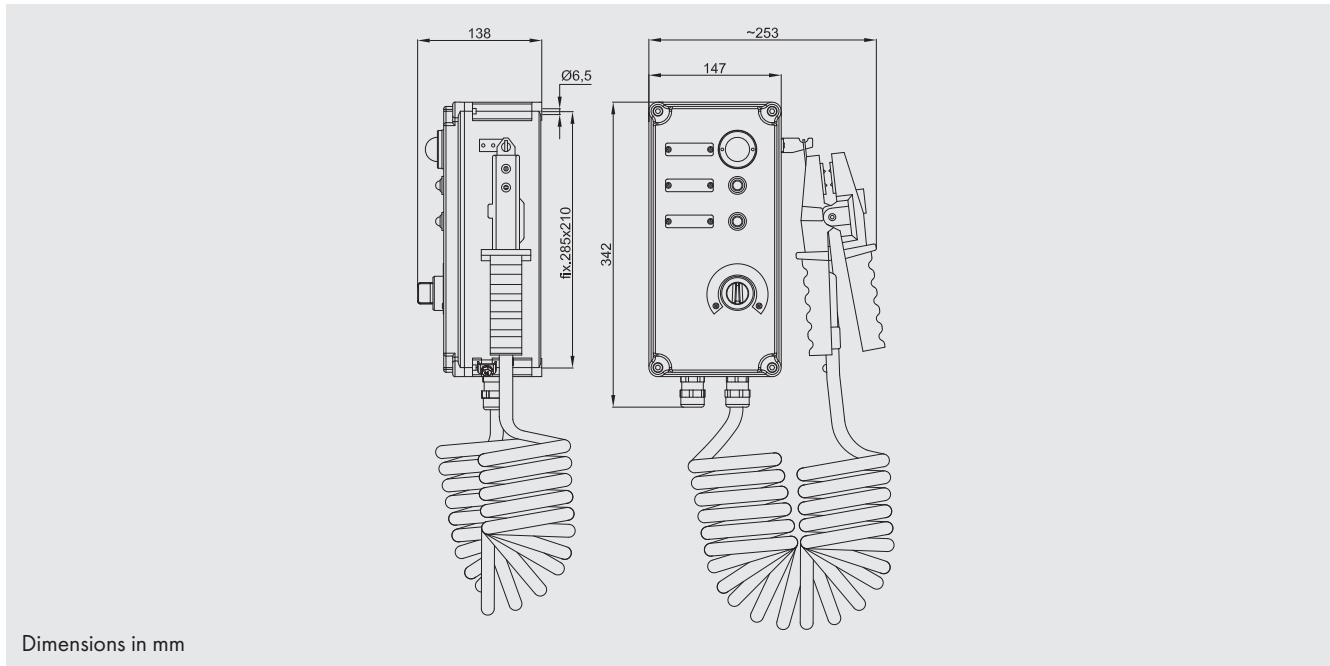
By-pass function

The GRDC earthing system has an integrated by-pass system, which in the event of critical conditions, e.g. rain, snow and excessive humidity, is still able to allow vehicle loading/unloading. In these cases, recognition of a tanker truck, for example, may not be reliable since the capacitive values can no longer be measured accurately. The by-pass consists of holding the selector switch on START for at least 10 seconds, thereby excluding the capacitive reading. If the pliers have been properly connected to a metal component, the green indicator light will come on giving consent for the operation.



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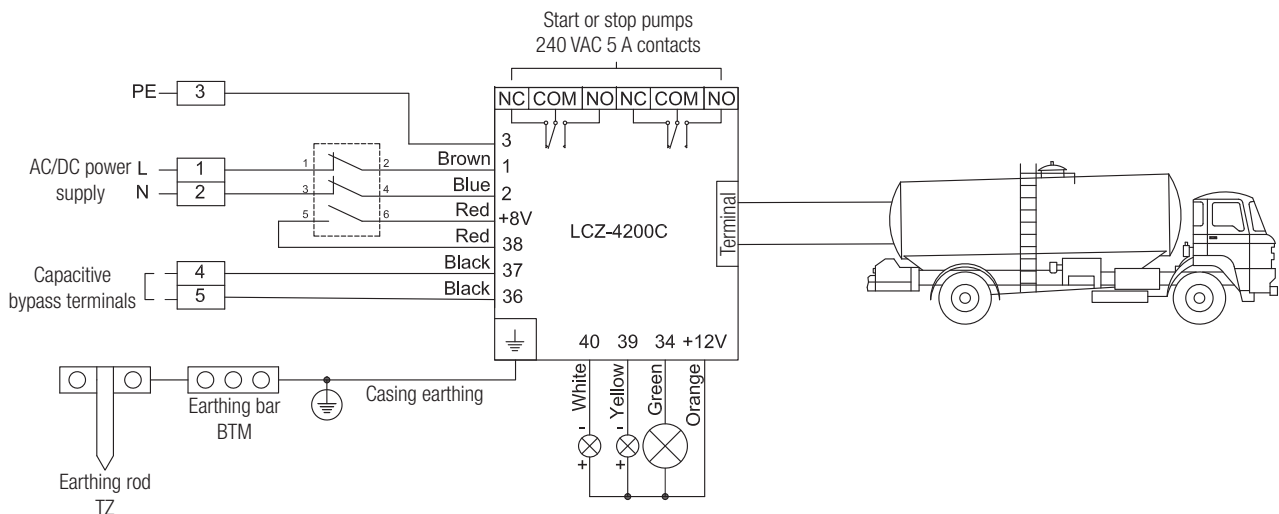
DIMENSIONAL DRAWING



SELECTION TABLE

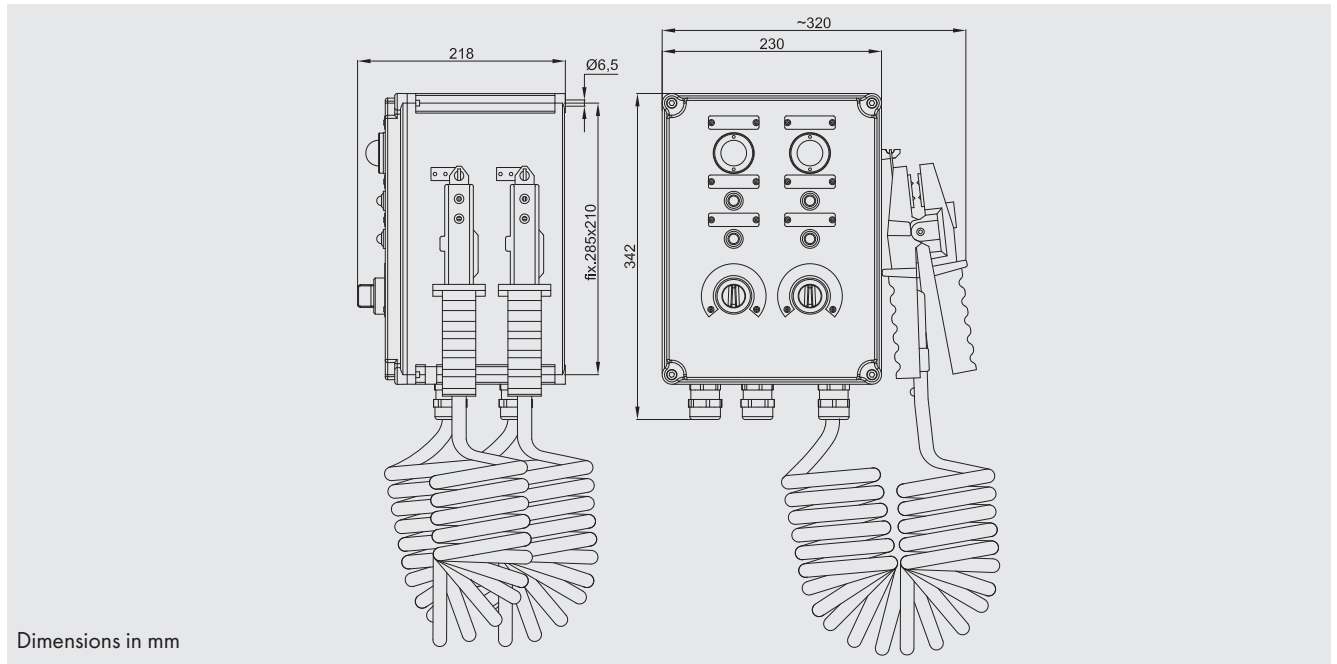
Code	Housing material	Number of pliers	Power	Power supply	Rated frequency	Weight
GRDC-4200	Aluminium	One set of pliers	< 10W	220-240 VAC	50 - 60 Hz	3.73 kg
GRDC-4200-24				12-24 VDC	0 Hz	3.73 kg
GRDC-4200-110				110 VAC	50 - 60 Hz	3.73 kg
GRDC-4200-P	Polyester	One set of pliers	< 10W	220-240 VAC	50 - 60 Hz	3.28 kg
GRDC-4200-P-24				12-24 VDC	0 Hz	3.28 kg
GRDC-4200-P-110				110 VAC	50 - 60 Hz	3.28 kg

WIRING DIAGRAM



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DIMENSIONAL DRAWING

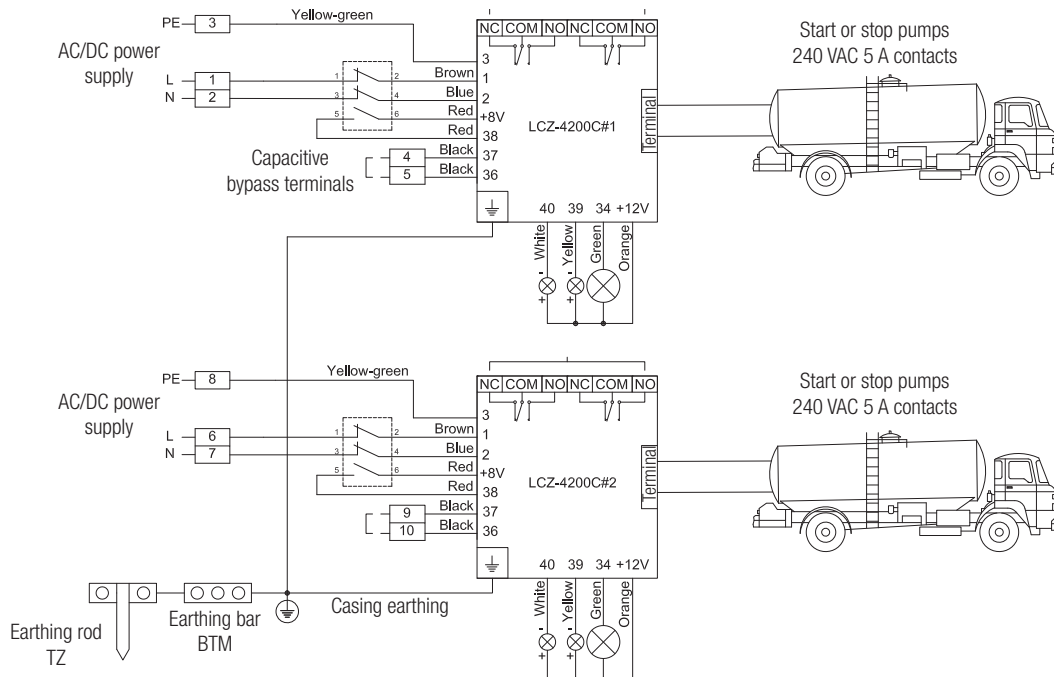


Dimensions in mm

SELECTION TABLE

Code	Housing material	Number of pliers	Power	Power supply	Rated frequency	Weight
GRDC-4200-2	Aluminium			220-240 VAC	50 - 60 Hz	6.93 kg
GRDC-4200-2-24				12-24 VDC	0 Hz	6.93 kg
GRDC-4200-2-110	Polyester	Two pliers	< 20W	110 VAC	50 - 60 Hz	6.93 kg
GRDC-4200-2P				220-240 VAC	50 - 60 Hz	6.13 kg
GRDC-4200-2P-24				12-24 VDC	0 Hz	6.13 kg
GRDC-4200-2P-110				110 VAC	50 - 60 Hz	6.13 kg

WIRING DIAGRAM



GRDC-4200 Accessories upon request and spare parts

ILLUSTRATION	DESCRIPTION	MODEL	CODE	LEGEND
	Green 12 VAC/DC multi-LED indicator light	GRDC...	M-0612/3V12	
	Yellow multi-LED indicator light	GRDC...	M-0487/G	
	Colourless multi-LED indicator light		M-0487/I	
	Switch	GRDC...	M-0604/3R	
	Monitoring logic	GRDC-4200...	LCZ-4200C	
		GRDC-4200...24	LCZ-4200C/24	
		GRDC-4200...110	LCZ-4200C/110	
	Earthing pliers	GRDC...	PZCC-4209	
	Yellow cable Length: 8 metres	GRDC...	20CE063	
	Cable gland cable range 6.5 - 14	GRDC...	NAV20SIB	 