

Additional Instructions - SMARTCON Control with Frequency Inverter

1 General

The SMARTCON control unit with frequency converter is used for monitoring and controlling an actuator and provides the interface between the operator, the control system and the actuator.

This version of the control unit is only available in control cassette design for separate mounting of the actuator. There are 2 different versions, the standard **CSC FU** and explosion-proof **CSCex FU** control unit.

2 Dimensions, Mounting

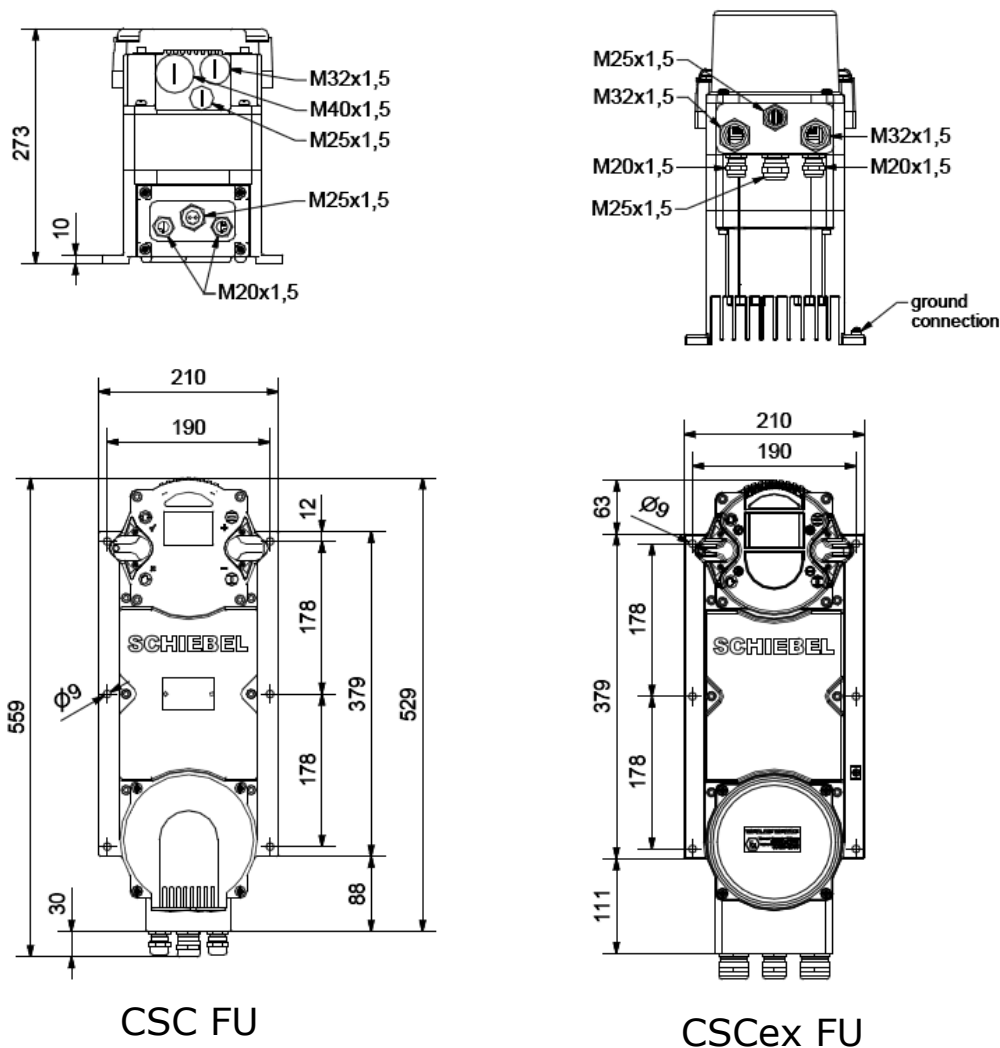


Figure 1: Dimensions

The control unit is designed to be mounted on a flat vertical wall in which a vertical orientation in accordance with the Figure 1. For mounting 6 boreholes (holes Ø9mm) are available at least the outer 4 must to be used. With the explosion-proof version CSCexFU it is to make sure that the cooling fins are not covered on the top and bottom of the unit and allow air circulation is impeded.

3 Electrical connection

WARNING: Work on the electrical system or equipment must be made in accordance with the applicable electrical engineering rules only by a qualified electrician or by instructed persons under the direction and supervision of a qualified electrician. Relevant safety regulations (OVE EN 1).



WARNING: Electric supply in a powered down state. Furthermore, make sure it comes to no electrostatic discharges during follow-up.



NOTE: Please connect the grounding screw first.

WARNING: When working in hazardous areas the European Standards EN 60079-14 "Electrical installations in hazardous areas" and EN 60079-17 must be observed "Inspection and maintenance of electrical installations in hazardous areas".



Warnings located on the control unit:

	ACHTUNG! Explosionsgefahr ATTENTION! Explosion hazard ATTENTION! Risque d'explosion ВНИМАНИЕ! Взрывоопасно
	Nur im spannungslosen Zustand öffnen Switch off power before opening Arrêter avant l'ouverture
	Отключите питание перед открытием
	ID:12991

	ACHTUNG! Explosionsgefahr ATTENTION! Explosion hazard ATTENTION! Risque d'explosion ВНИМАНИЕ! Взрывоопасно
	Nur im spannungslosen Zustand öffnen Nach dem Abschalten 5 Minuten warten vor dem Öffnen Switch off power before opening After de-energizing, delay 5 minutes before opening Arrêter avant l'ouverture
	Après la coupure, attendre 5 minutes avant d'ouvrir Отключите питание перед открытием
	ID:13502

После выключения ждать 5 мин. потом возможно открыть

CAUTION: Check whether the system-side supply (voltage, frequency) with the motor data (refer to motor type plate) matches.



NOTE: The connection of the electrical wiring must be in accordance with the operating instructions for actuators including Smartconsteuering and the relevant connection diagram. This is in reporting or connection housing. The diagram can be ordered quoting the serial number at SCHIEBEL.

CAUTION: Indicated on the nameplate of protection is only ensured if suitable cable glands are used, ie the protection of the cable glands must be at least equal to the protection of his control, and the cable gland must be suitable for the corresponding cable diameter. Unused cable entries must be fitted with suitable blanking screws may or supplied blind screws can not be removed.



For controllers in Ex version, the cable glands must additionally have an Ex "e" approval!
 General it should be observed when mounting that not only the tightness of the cable gland for cable, but also the tightness of the housing or cover part is guaranteed.
 The corresponding manufacturer's instructions must be observed!

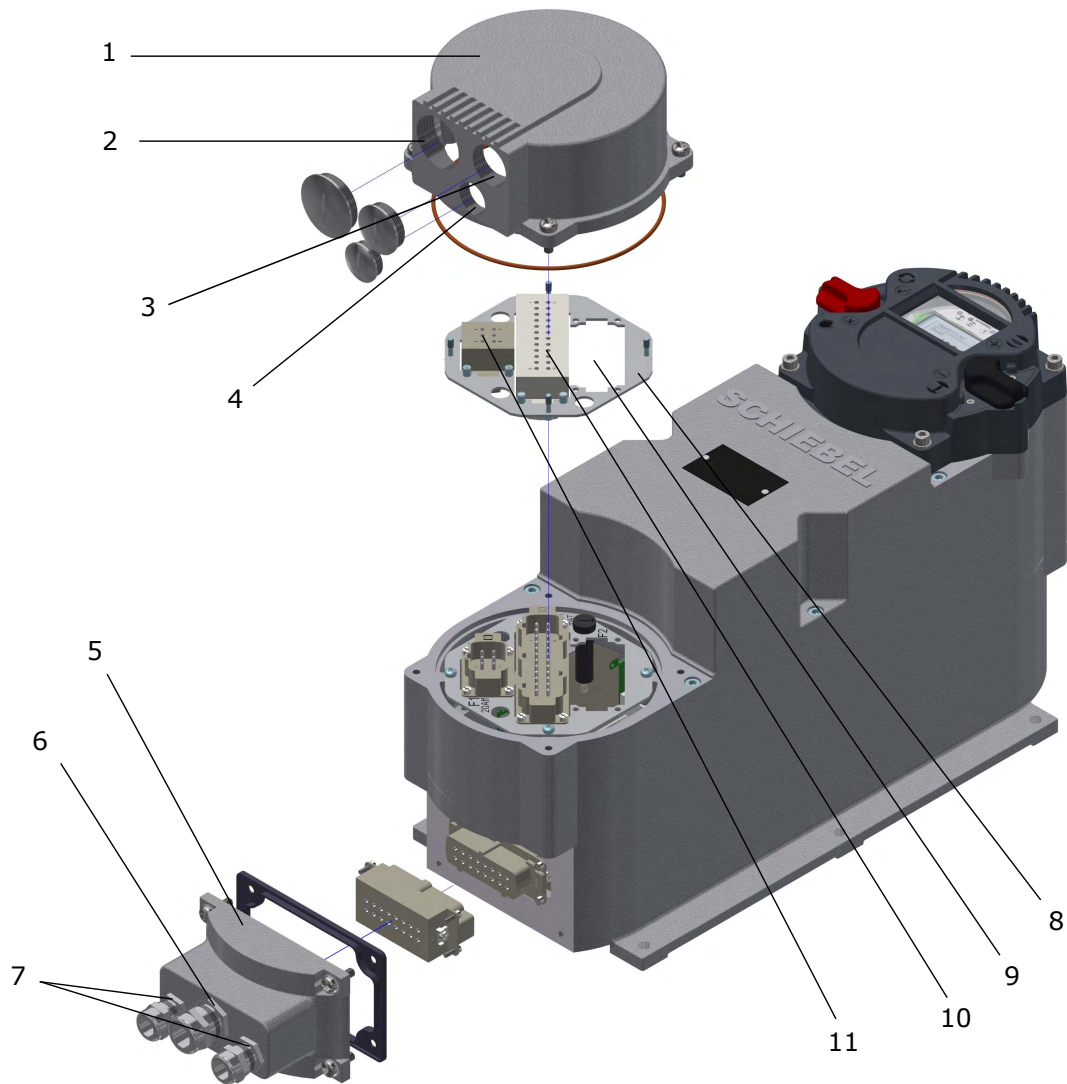


Figure 2: Connection normal version

1...Connection cover customer connection, 2...metric screw (are sealed delivered with blind screws) M40x1,5, 3...M32x1,5, 4...M25x1,5, 5...Connector cover joint actuator, 6...M25x1,5, 7...M20x1,5, 8...connector plate, 9...plug insert (for relay and bus board - option), 10...plug insert (for control cables), 11...plug insert (for power supply)

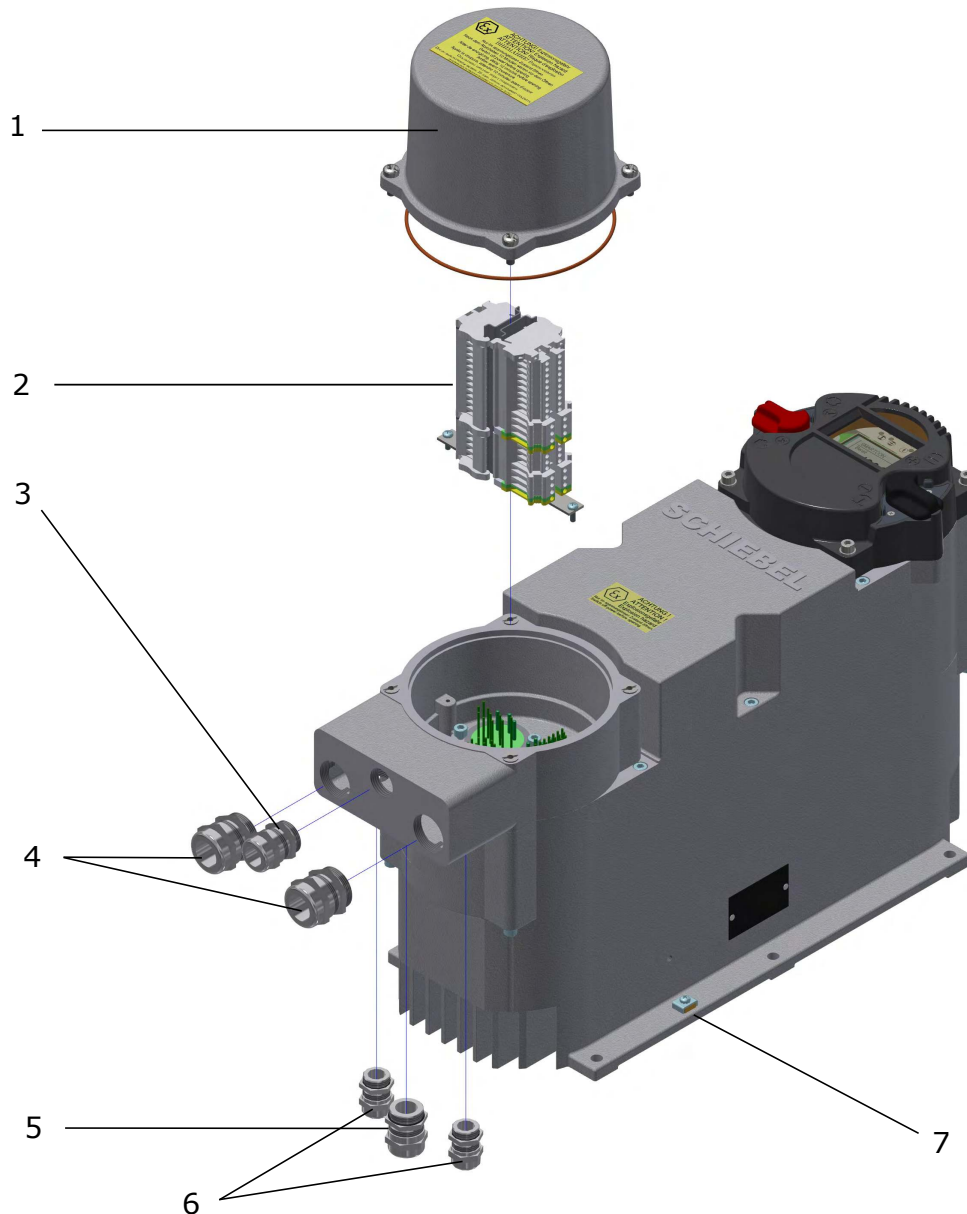


Figure 3: Connection Ex-version

1 ... connecting lid, 2 ... Terminal, 3 ... metric screw for customer connection (are delivered with blind screws closed) M25x1.5, 4 ... M32x1.5, 5 ... metric screw for connection to the actuator M25x1.5, 6 ... M20x1.5, 7 ... external grounding

Depending on the order the following connection are possible:

- In standard design then connection of control signal and motor are made via plug (see Figure 2) with screw (In = 16A): The maximum conductor cross-section is 2,5mm²
- For **Ex-design** or on sepcial order, the connection is made with terminals! (see Figure 3): The maximum conductor cross-section for the control signals is 2.5 mm and 4mm² for the power connection
On order (or if required due to high currents) also larger terminals are used for the motor connection.

For controllers in explosion-proof design both the outer grounding (connection cross section 4 mm²) and the ground lying in the terminal box must be connected.

On request there are additional pre-assembled connecting cable to the actuator available.

NOTE: When using options such as Profibus the additional guidelines must be observed.

After connecting, please check the points below:

- The sealing surfaces on the cover and housing must be cleaned.
- Check, whether the O-ring is in good condition.
- Lightly grease the sealing surfaces with acid-free grease (e.g. vaseline).
- The cover is to be put on and screws are to be tightened evenly crosswise.
- Tighten the cable glands to the prescribed torque to ensure that the specified degree of protection class is guaranteed.

3.1 Technical data, Fuses

NOTE: Fuses and switch-disconnectors are required on site for short-circuit protection and for disconnecting the actuator.



According to the following tables, the following current values apply and fuses must be dimensioned accordingly. Type gG fuses must be used for installation according to IEC. The nameplate data and the order documentation must also be observed!

Power supply 1x 230V 50Hz

Designation	FU-FC280-...	0,37-230	0,55-230	0,75-230	1,1-230	1,5-230	2,2-230
Frequency Inverter Type		PK37	PK55	PK75	P1K1	P1K5	P2K2
Typical Shaft Power	$P_{M,N}$ [kW]	0,37	0,55	0,75	1,1	1,5	2,2
Input Current	$I_{L,N}$ [A]	2,9	4,4	5,5	7,7	10,4	14,4
	$I_{L,MAX}(60s)$ [A]	4,6	7,0	8,8	12,3	16,6	23,0
Max. Fuses	IEC Typ gG [A]	20	20	20	20	20	20

Power supply 3x 400V 50Hz

Designation	FU-FC280-...	0,37-400	0,55-400	0,75-400	1,1-400	1,5-400
Frequency Inverter Type		PK37	PK55	PK75	P1K1	P1K5
Typical Shaft Power	$P_{M,N}$ [kW]	0,37	0,55	0,75	1,1	1,5
Input current	$I_{L,N}$ [A]	1,2	1,7	2,2	3,0	3,7
	$I_{L,MAX}(60s)$ [A]	1,9	2,7	3,5	4,8	5,9
Max. Fuses	IEC Typ gG [A]	10	10	10	20	20
Designation	FU-FC280-...	2,2-400	3,0-400	4,0-400	5,5-400	
Frequency Inverter Type		P2K2	P3K0	P4K0	P5K5	
Typical Shaft Power	$P_{M,N}$ [kW]	2,2	3	4	5,5	
Input current	$I_{L,N}$ [A]	5,3	7,2	9,0	12	
	$I_{L,MAX}(60s)$ [A]	8,5	11,5	14,4	19,2	
Max. Fuses	IEC Typ gG [A]	20	25	25	25	

4 Settings and parameters

The setting and parameters are set in the context of the actuator according to the operating instructions for actuators with SMARTCON control units.

5 Malfunctions

In case of a malfunction of the CSC FU or CSCex FU, please perform following checks:

Error Description	Action
smartcon supplied with main power: dark display	Check the main power supply. If supply voltage is OK, check fuse C606f
Smartcon supplied with 24V: dark display	Check the control voltage supply (terminal 1 (+) and 2 (-) on the control plug or control terminals if the 24V DC are present If OK check fuse C302b.
No binary outputs	Check the voltage (terminal 13 (+) and 14 (-) on the control plug or control terminals if the 24V DC are present If OK check fuse C302a.
No power to the heating resistor in the actuator	Check the fuse C408

NOTE: Fuses can be changed as described in chapters 5.1 and 5.2.

5.1 Fuse replacement for standard version CSC FU

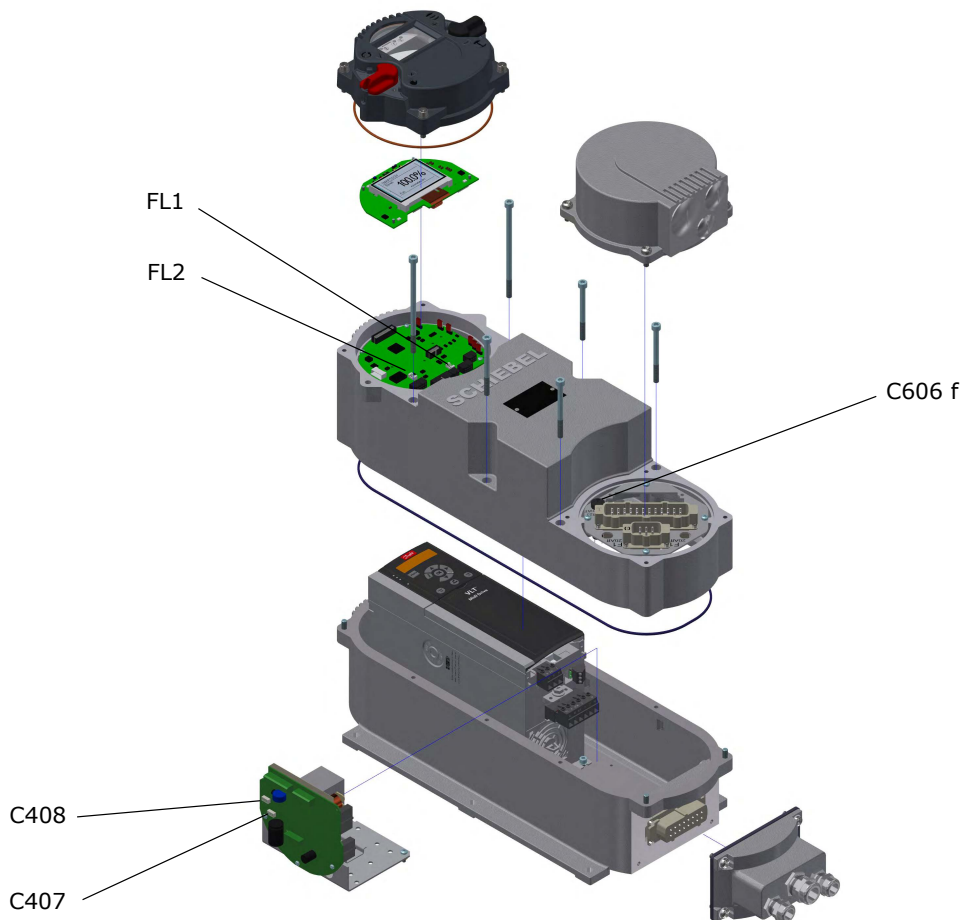


Figure 4: Fuses - standard version

Description	Position	application	Type	trigger value
FL1	Logic	24V auxiliary supply	Littelfuse 454 NANO ² Slo-Blo [®] träge	1 AT
FL2	Logic	binary outputs	Littelfuse 454 NANO ² Slo-Blo [®] träge	4 AT
C407	supply	safeguarding supply	Littelfuse 454 NANO ² Slo-Blo [®] träge	1 AT
C408	supply	safeguarding heating	Littelfuse 454 NANO ² Slo-Blo [®] träge	500 mA
C606 f	connection compartment	tax insurance	finely insurance 6,3x32	125 mA

NOTE: Please refer to the safety measures described in section 3, page 2 when working on fuses!

WARNING: Perform work only when the power is off!



For the access to the internal fuses (C407 and C408) the housing upper part must be removed. Therefore it is necessary to remove the actuator connector in order to access the underlying screw. Furthermore, it should be noted that between the upper and lower part there is a cable connection which must not be removed. For the work the upper part gently tilt to the side!

When refitting check seals and sealing surfaces. Seal the surfaces lightly with acid-free grease (eg Vaseline). Replace cover and make sure that no wires are pinched. Tighten screws evenly crosswise.

5.2 Fuse replacement for explosion-proof CSCex FU

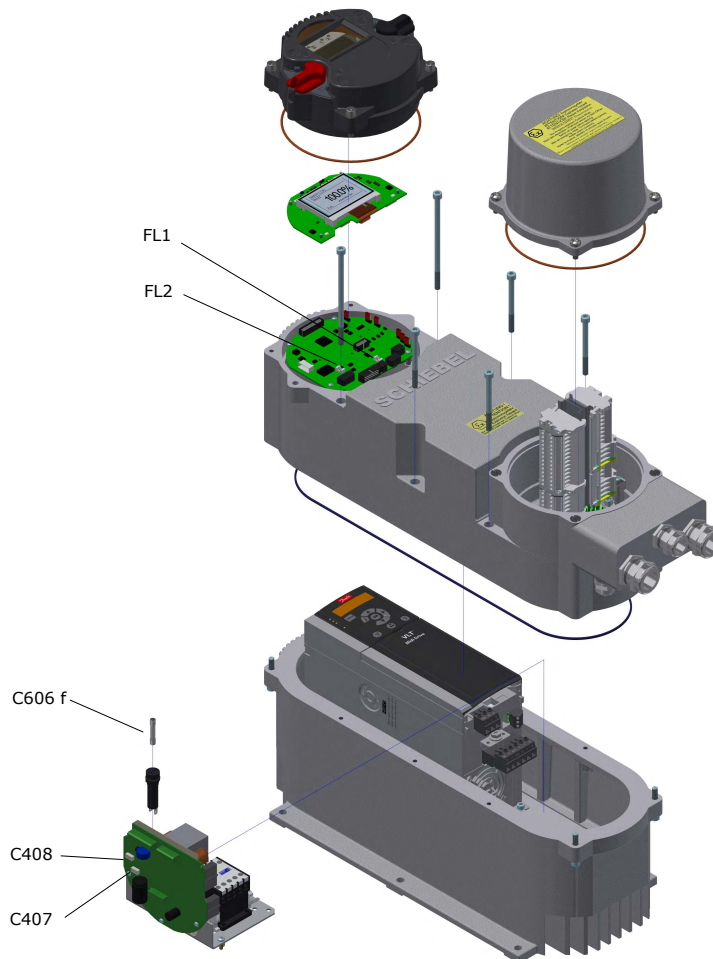


Figure 5: Fuse Ex-Version

CAUTION:



- **Pressure proof encapsulation! Before opening, check the absence of gas and if the unit is de-energized.**
- **Note signs on the device!**
- **Handle cover and housing parts carefully.**
- **Cleavage surfaces must not show any damage or contamination.**
- **Do not tilt the cover during assembly.**

For the access to the internal fuses (C407 and C408 and C606f) the housing upper part must be removed. Furthermore, it should be noted that between the upper and lower part there is a cable connection which must not be removed. For the work the upper part gently tilt to the side!

When refitting check seals and sealing surfaces. Seal the surfaces lightly with acid-free grease (eg Vaseline). Replace cover and make sure that no wires are pinched. Tighten screws evenly crosswise.

5.3 Maintenance

Generally the unit is maintenance-free.

Should be opened in the course of repair work cover the sealing surfaces and seals for damage or condition to check and if necessary replace.

It is recommended to annually conduct a visual inspection of the unit for mechanical damage that could affect the degree of protection.

Specifically, the cable entries must be checked for tightness of the cable and condition of the seals.

At least every 5 years to check the seal of the connection cover on condition.

5.4 Technical data

Product	CSC FU	CSCex FU
Housing and cover	Aluminium, painted	
Weight	max. 18 kg	max. 22 kg
Supply voltage (range)	three-phase 380-440VAC +/-10%; 50, 60Hz	
.....	single-phase: 220-240VAC +/-10%; 50, 60Hz	
Rated power (typical wave power)	0,37 - 5,5 kW (1,5kW 1phasig)	
frequency range (Output)	5-50Hz (Speed ratio 1:10)	
Binary In/Outputs	see instructions for actuators with SMARTCON control	
Analog In/Outputs	see instructions for actuators with SMARTCON control	
Auxiliary voltage input	see instructions for actuators with SMARTCON control	
Protection (EN 60529)	IP67	IP65 (IP67)
ambient temperature	- 10° to + 60°C	- 10° to + 40°C
Type of protection	-	Ex II2G EX de IIBT4
certificate number	-	TÜV-A 08ATEX0006