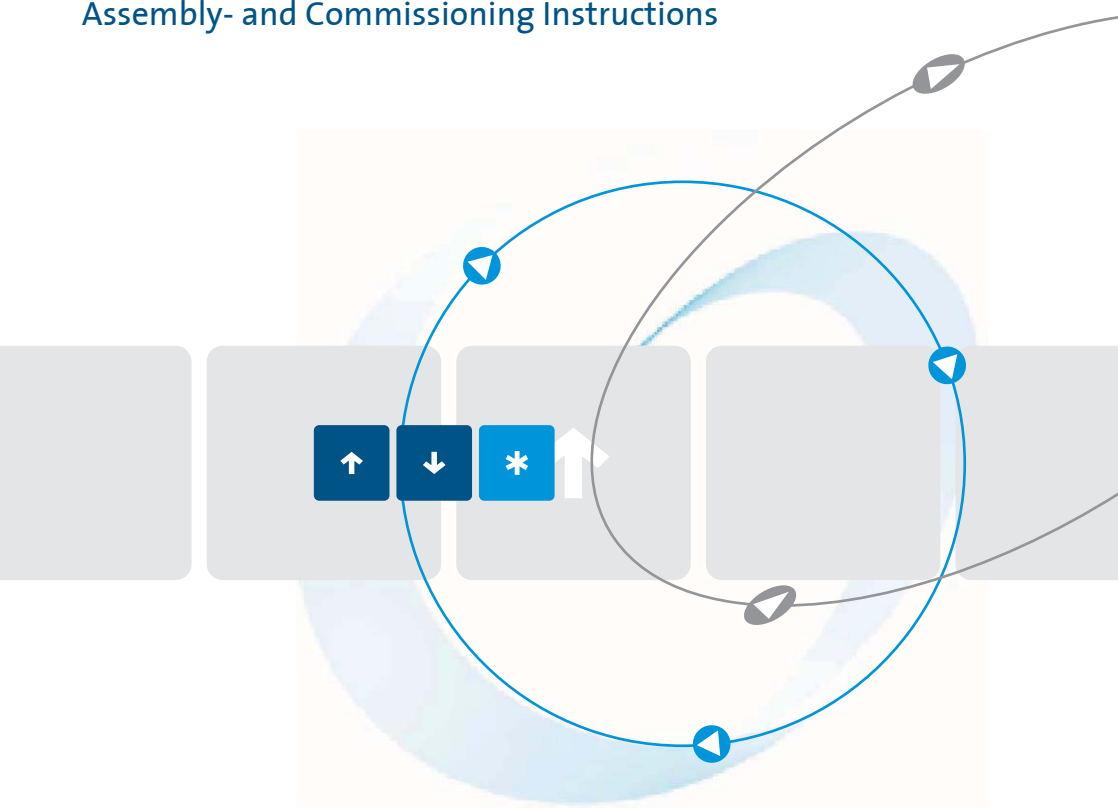


Thyristor Controllers
SGP 160-1.4/1.5 (G)
Assembly- and Commissioning Instructions



as per 04/10

12000.10001

Table of Contents	Page
1. Safety notes	3
2. Conformity	3
3. General description	4
4. Usage to the intended purpose	4
5. EC declaration of Conformity	5
6. Block diagram	6
7. Electrical data	6
8. Parameter setting	6
9. Environmental conditions	7
10. Dimensions	7
11. Installation guidelines	8
11.1 Connection diagram	8
11.2 Radio interference suppression and shielding	9
11.3 Arrangement	9
11.4 Shielding	9
11.5 Cabling	10
11.6 Accessories	10

These commissioning instructions were prepared with great care. Nevertheless, PETER electronic GmbH & Co. KG does not assume liability for damage resulting from mistakes possibly contained in this manual. Technical changes that serve to improve the product are subject to change without notice.

Notes and symbols used in these instructions

Note: Notes explain the advantages of certain adjustments or settings and help you to make use of the device in the best possible way.



Warning notices: Read them carefully and follow them strictly!

Warning notices are indicated in order to protect you against danger or to help you to prevent the device from being damaged.



Caution: Danger to life through electric shock!

When you see this sign, always make sure that the device is de-energized and secured against unintentional energizing.

1. Safety notes



The described devices are electrical equipment for use in industrial electrical power installations. An impermissible removal of the covers during operation can cause serious damage to your health, since these devices contain live parts with high voltages.

Adjustment work may only be performed by trained staff observing the safety regulations. Assembly and mounting work may only be carried out with the equipment deenergized.

Make sure that all drive components are properly earthed.

Please read these commissioning instructions carefully before putting the device into operation.

Besides, the user must ensure that the devices and associated components are fitted and connected in accordance with the applicable local, legal and technical regulations. The VDE-regulations VDE 0100, VDE 0110 (EN 60664), VDE 0160 (EN 50178) , VDE 0113 (EN 60204, EN 61310), VDE 0660 (EN 50274) plus the appropriate regulations of the TÜV (Technical Control Association) and the trade associations apply in Germany.

The user must ensure that the drive turns into a safe operating state following a device failure, in the event of maloperation, or if the control unit has failed etc..

Caution: Even if the motor is at rest, it is **not** physically separated from the mains.

2. Conformity

The user takes the responsibility to ensure that the user's design and construction comply with the applicable legal provisions.

The commissioning is strictly forbidden as long as the conformity of the final product with the directive 2006/42/EC (machinery directive) is not proved.

To be able to use the devices to their intended purpose, it requires power supply networks according to DIN EN 50160 (IEC38).

The user takes the responsibility that the user's design and construction comply with the applicable legal provision.

The commissioning is strictly forbidden as long as the conformity of the final product with the guidelines 2006/42/EC (Machinery directive) and 2006/95/EC (Low voltage directive) is not proved.

3. General description

The one-quadrant thyristor controllers of the SGP 160-1.4/1.5-series are designed for the operation of d.c. motors with permanent excitation or field winding up to a motor shaft power of 150 watts.

The controllers are either deliverable as built-in devices or as controllers with housing and integrated setpoint potentiometer and mains switch.

With a special circuit arrangement implemented by the customer the devices of the type series SGP 160-1.4 enable a re-adjustment of the motor speed similar to that of an armature voltage control.

In the case of the type series SGP 160-1.5 a current limiting controller has been integrated in addition to the speed controller (armature voltage control). If the actual current exceeds the adjusted current setpoint value, the current limiting controller regulates the armature voltage down. Thus, it allows no overcurrents and prevents the drive from being overloaded. Motors with permanent excitation may be operated without any problems as well.

The power section consists of a single-phase, half-controlled, symmetrical bridge circuit and an excitation voltage source. Circuit-commutated recovery time problems, which in the case of power semiconductor circuits with only one thyristor - especially in motors with permanent excitation - may occur, can be ruled out with this type of circuit. In addition, the electronics features a snubber circuit to protect the power semiconductors.

To ensure a good commutation and a long service life of the carbon brushes, we recommend to use a smoothing reactor. As a special version the variants with housing are deliverable with an incorporated smoothing reactor.

4. Usage to the intended purpose

The devices of the SGP 160-1.4/1.5-series are electrical equipment that is used in industrial electrical power installations. They are designed for the application in machines, in order to control speed-variable drives with d.c. motors.

Typical Applications

- conveying systems
 - printing machines
 - pumps
 - rotary table drives
 - welding wire feed mechanisms
 - packaging machinery
-

5. EC declaration of Conformity

EC Declaration of Conformity 

The manufacturer / company placing the product on the market
(authorized representatives of the manufacturer / companies placing the product on the market
that are established within the Community)

Name / Address: Peter Electronic GmbH & Co.KG
Bruckäcker 9
92348 Berg
Germany

hereby declares that the following product (device, component, unit) in the version as supplied

Product designation: DC Thyristor Controller
Serien / type designation: SGP 160-1.4/1.5 (G)
Article group: 220...
Year of manufacture: 2000

complies with the provisions of the following EC-directives:

2004/108/EG concerning Electromagnetic compatibility and **2006/95/EG** concerning Electrical equipment designed for use within certain voltage limits

The following harmonized standards have been applied:

EN 60947-1: Low-voltage switchgear and controlgear General rules	EN 60947-4-2: Low-voltage switchgear and controlgear Contactors and motor-starters - AC semiconductor motor controllers and starters
--	--

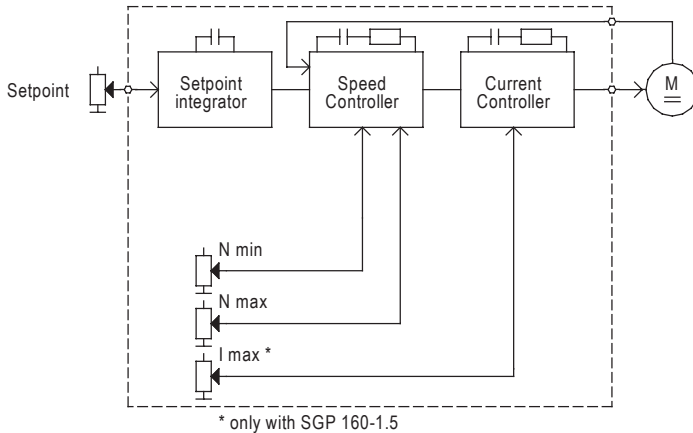
This EC Declaration of Conformity is no longer valid, if the products is modified or changed without our agreement.

This declaration is issued under the sole responsibility of the signatory.

Berg, 05.08.2009 Dr. Thomas Stiller, Managing Director
(place, date) (signatory and function of the signatory)


(signature)

6. Block diagram



7. Electrical data

	SGP 160-1.4 (G)	SGP 160-1.5 (G)
Operating voltage according to DIN EN 50160 (IEC38)	230V +15% 50/60Hz	
max. Output power	240W	
max. Motor shaft power	150W	
Armature voltage	0 ... 180VDC	
max. Armature current	1.5A eff.	
Excitation voltage/current	200VDC / 0,5A	
Control range	1:10	1:20
Setpoint potentiometer 2.5kV test voltage	1M Ohm linear	10k Ohm linear
Fuses	4A flink	4A superflink

8. Parameter setting

Adjustable minimum speed	0 ... 50%	0 ... 50%
Adjustable maximum armature voltage	100 ... 200VDC	
Adjustable current control range	-	0.7 ... 1.5A eff.

9. Environmental conditions

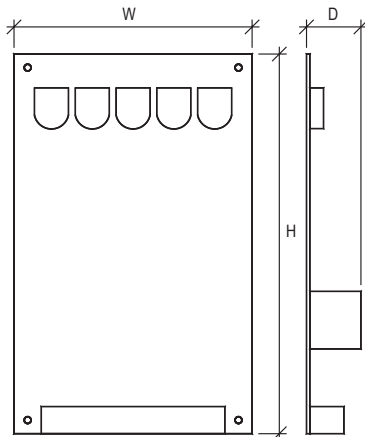
	SGP 160-1.4 (G)	SGP 160-1.5 (G)
Storage temperature	-25°C ... 75°C	
Operating temperature	0°C ... 45°C	
Degree of protection		
Built-in device	IP 00	IP 00
Version with housing	IP 44	IP 44
Environment	Overvoltage category III, pollution degree 2	

10. Dimensions

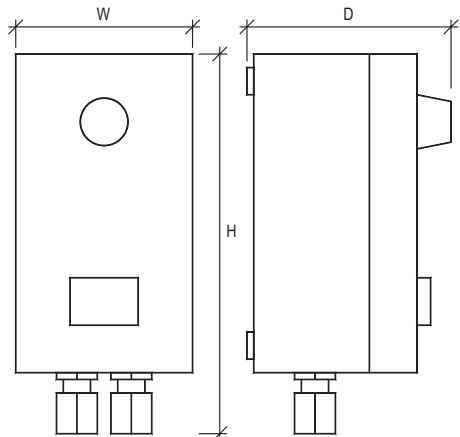
	H (mm)	W (mm)	D (mm)	Weight (g)
SGP 16-1.4/1.5	110	67	30	175/250
SGP 160-1.4/1.5G ¹	194	80	84	450/510

¹ Housing with mains switch and potentiometer, external mains filter required

Built-in device

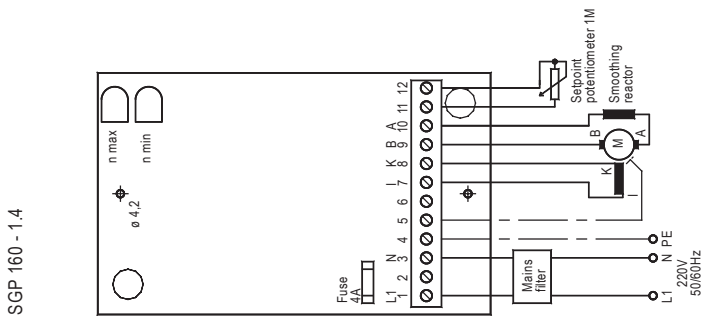
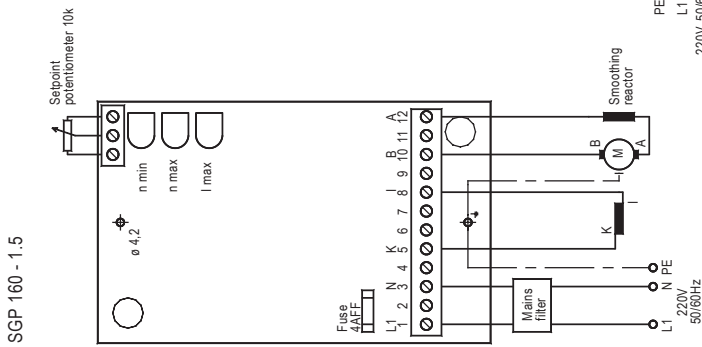
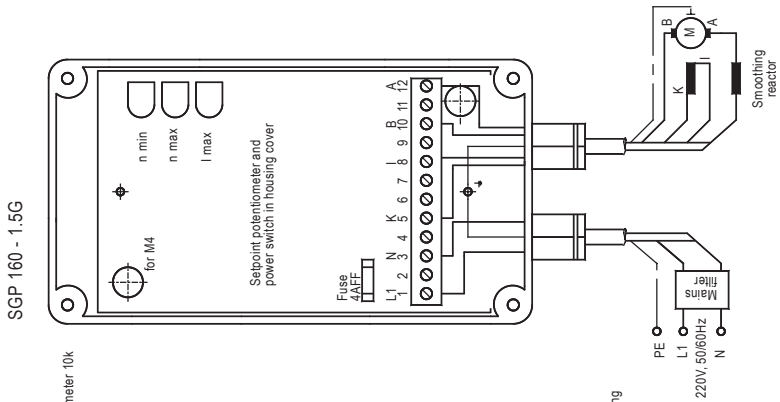


Device with housing "G"



11. Installation guidelines

11.1 Connection diagram



11.2 Radio interference suppression and shielding

As early as during the installation of thyristor controllers, interference from the realm of radio interference suppression and immunity has to be reduced to a tolerable level (EC-EMC-directive). Interference suppression that has to be subsequently implemented in an already installed system often causes costs that are higher by far.

The use of interference suppression filters in the mains supply line or on the output alone, does not resolve these interference problems. These problems can only be solved if the filter elements are appropriately **arranged** and both the **cabling** and the **shielding** are properly implemented.

However, whether or not the radio interference limit values are complied with can only be checked by taking measurements.

11.3 Arrangement

The controller and the filter have to be mounted as close as possible next to each other and must be earthed with large-surface contact. This is best done by means of a mounting plate (figure 1). The lacquer on the contact areas of this mounting plate has to be removed. The lacquer on the contact areas of the controller or filter must be removed, too.

For this reason, some switchgear cabinet suppliers offer mounting plates featuring conductive coating.

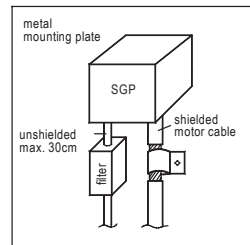


Figure 1

11.4 Shielding

To prevent the controller from radiating interfering energy to the environment, it should be installed in a metal-enclosed housing (switchgear cubicle or switchbox); the following cables must be shielded:

- Cable between mains filter and controller, if it is longer than 30cm.
- Control cables, if they are longer than 2m.

Cables for digital signal transmission must be connected on both ends to the earth potential. Cables for highly impedant analog control signals (setpoint value) must only be earthed on one side in order to avoid a 50Hz-hum.

The shield bondings must always be implemented with large-surface contact (Figure 2a,2b). Therefore, bondings with supplementary earth wire, via connector pins or wire connectors are not allowed (Figure 2c).

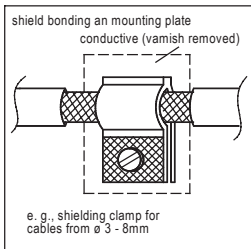
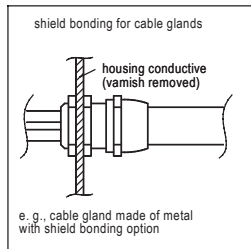
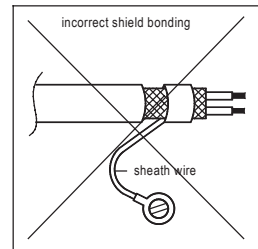


Figure 2a



2b



2c

11.5 Cabling

To avoid mutual interference/cross couplings it has to be ensured that, when laying the cables, a minimum distance of 20cm is kept between control cables and power cables. If control cables have to cross power cables, they have to be laid at an angle of 90° (Figure 3).

When connecting shielded cables, make sure that the unshielded cable ends are as short as possible. The large-surface shield bonding must not necessarily be located on the end of the shield but may also be implemented in a suitable place - at a distance of some centimeters (Figure 4).

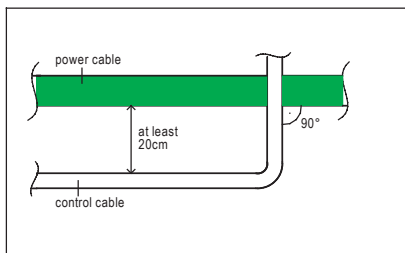


Figure 3

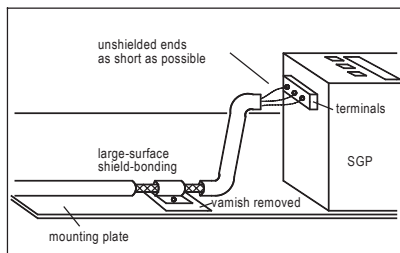


Figure 4



ATTENTION!

When using mains filters, the leakage currents are increased.

For the respective leakage currents please refer to the corresponding data sheets. Leakage currents up to 3.5mA and permanent connection require no special additional earthing measures.

According to VDE 0160 (EN 50178) the following applies to the most common applications:

If in the case of permanently connected devices an operational leakage current of 3.5mA is exceeded, one of the following conditions must be complied with.

1. Cross-sectional area of protective conductor of at least 10mm²
2. Monitoring of the protective conductor by means of a device/system which in case of a fault causes an automatic switch-off.
3. Installation of a second conductor, electrically in parallel to the protective conductor via separate terminals. This conductor by itself must meet the requirements according to VDE 0100, part 540.

11.6 Accessories

Mains filter	NF 250/3	Article-No. 27000.25003
Armature current reactor	SGP 5-78	Article-No. 23000.07802



www.peter-electronic.com

