BETRIEBSANLEITUNG
OPERATING INSTRUCTION

deutsch
english

SPG 501 FANCONTROL
SPG501_004
SPG501_005

CE

SMARTPRESSUREGATE FANCONTROL

Druckregeleinheit für Kälteanlagen mit elektronischer Drucküberwachung und Digitalanzeige
Pressure regulator for refrigeration systems with electronic pressure monitoring and digital display

WWW.LEITENBERGER.DE

MADE IN GERMANY

Content

1. Intended use

With the SmartPressureGate SPG501 FanControl, the high and low pressures in refrigeration systems can be monitored and, with the aid of switching outputs, be regulated and output as alarms. The analog outputs can for example be used to regulate the fan.

Via the RS485 interface, the SPG501 can be read out and configured by means of Modbus RTU.

Can be used for refrigerants R22, R23, R134a, R404a, R407c, R407f, R410a, R448a, R449a, R507. Any other use is considered a non-intended use.

2. Safety precautions

Please read these operating instructions carefully.

To ensure safe and reliable work,
only use the device for the described application.

The device may only be installed and commissioned by refrigeration technicians from certified companies with electrotechnical training in the field of low voltage.
The device may only be operated by certified refrigeration technicians from certified companies.

DANGER
Electrical shock can result in burns and life-threatening injuries.
The device must not be opened.
In the event of a defect, return the device to the manufacturer.

DANGER
Electrical shock can result in burns and life-threatening injuries.
Before beginning installation and maintenance work, switch off mains voltage.

CAUTION
When using refrigerants that are not listed in chapter “Specifications”, injuries may occur due to higher pressures or leaks.

DANGER
Fires may occur when using combustible refrigerants.
It is therefore forbidden to operate the device with combustible refrigerants.

WARNING
This device is not a safety-related installation. It may only be used in the commercial sector. The system must absolutely be equipped with an approved safety valve. If not observed, there is a danger of injuries and environmental damage caused by the discharge of refrigerants in the event that the system limits are exceeded.

WARNING
The discharge of refrigerants that are under pressure may cause eye injuries. Wear protective glasses during installation and maintenance work.

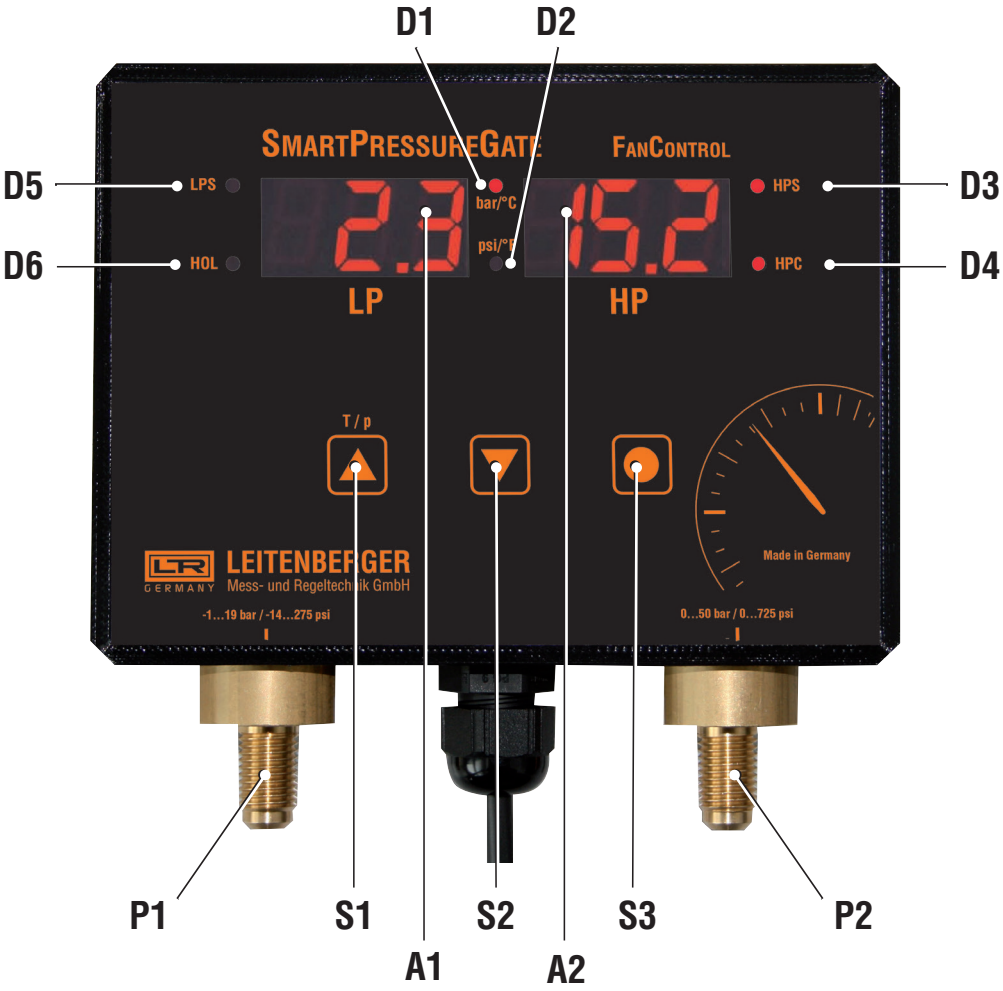
3. Specifications

- Supply Voltage: 100...240 VAC @ 47...63 Hz, 140...340 VDC
- Consumption Current: 200 mA max.
- Display: 3 Digit LED for LP
  3 Digit LED for HP
- Output contact rating: 5A @ 250 VAC, not protected
- Cable specifications: 1.4 A @ 20° C
  The specified switching currents must not exceeded and an additional, external protection must be adequately dimensioned.
- Analog output LP: 4...20 mA / 0...10 VDC @ -1...+19 bar
- Analog output HP: 4...20 mA / 0...10 VDC @ 0...50 bar OR FanControl (see pt. 14)
- Operating temperature: -25°...+55° C RH 60 %
- Protection class: IP 65 according to IEC 60529
- Pressure connection: 7/16“ - 20 UNF
- Refrigerants: R22, R23, R134a, R404a, R407c, R407f, R410a, R448a, R449a, R507
- Storage conditions: Store the device in a clean and dry environment.
  Keep the device in a place inaccessible to unauthorised persons.

4. Pressure Ranges

	Low pressure (LP) relative	High pressure (HP) relative
Pressure Range	-1...+19 bar / -14...+275 psi	0...50 bar / 0...725 psi
Accurancy	±0.5 % Fullscale	
	±0.1 bar / ±1.5 psi	±0.25 bar / ±3.6 psi
Overload warning	1 % overload (OFL is blinking & acoustic warning)	
	19.2 bar / 278 psi	50.5 bar / 732 psi
Overload	3 % overload (OFL in display & acoustic warning)	
	19.6 bar / 284 psi	51.5 bar / 746 psi
Physical Overload	40 bar / 580 psi	100 bar / 1450 psi
Burst pressure	60 bar / 870 psi	140 bar / 2030 psi

5. Overview

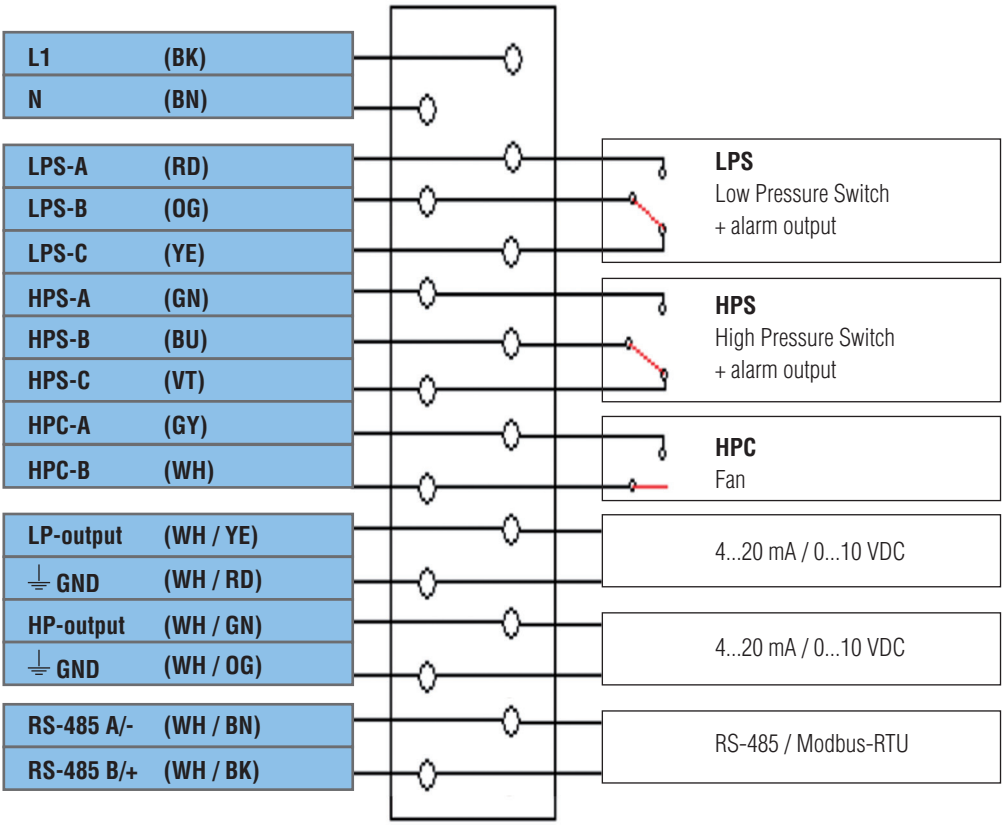


S1	Button 1	**D3**	HPS LED
S2	Button 2	**D4**	HPC LED
S3	Button 3	**D5**	LPS LED
A1	LP display	**D6**	HOL LED
A2	HP display	**P1**	LP sensor connection
D1	bar/°C LED	**P2**	HP sensor connection
D2	psi/°F LED		

6. Notation

HP (High Pressure):	High pressure from compressor.
LP (Low Pressure):	Low pressure to compressor (suction).
HPS (High Pressure Switch):	Compressor discharge pressure sensor in conjunction with the alarm switch.
Hdt (High Pressure Delay Timer):	HPS delay timer for switch OFF to prevent Hunting.
HPd (HP Switch Differential Pressure):	HP differential pressure value for HPS value to switch on the charger.
HPC (High Pressure Control):	Fan operating pressure value. Compressor discharge pressure sensor in conjunction with the condenser with fan motor control switch.
HIF (HP Differential Pressure):	Fan differential pressure value for HPC value. Compressor discharge pressure sensor in conjunction with the condenser with fan motor control.
LPS (Low Pressure Switch):	Fan operating pressure value. Compressor discharge pressure sensor in conjunction with the condenser with fan motor control switch.
LIF (LP Differential Pressure):	Fan differential pressure value for HC2 value. Compressor discharge pressure sensor in conjunction with the condenser with fan motor control.
Ldt (LP Delay Timer):	Compressor suction pressure sensor in conjunction with an automatic return control switch.
FAN (Fan control):	Activate or deactivate fan control via analog output
FHP (Fan High Pressure):	HP-pressure at which the maximum analog value is given out (active at „FAN ON“)
FLP (Fan Low Pressure):	HP-pressure at which the minimum analog value is given out (active at „FAN ON“)
FLL (Fan Low Level):	Minimum analog value of span at output in %
HHA (Manual Mode & Automatic Mode):	Resetting HPS at HP = HPS - HPd. A: HPS reset automatically. H: HPS reset after quitting button 3.
LHA (Manual Mode & Automatic Mode):	Resetting LPS at LP = LPS - LIF A: LPS reset automatically. H: LPS reset after quitting button 3.
GAS:	Refrigerant gas selection.
Unt:	Pressure unit selection.
C-F:	Temperature unit selection.
ADD:	Setting the device address on the RS485 communication port for using ModBUS RTU.
RES:	Reset all changeable parameters to the default values.

7. Connection diagram



8. Status LEDs

HPS: switching state High Pressure Switch.
LPS: switching state Low Pressure Switch.
HPC: switching state High Pressure Control.
HOL: off → automatic mode active
on → manual mode active
blinking → setting mode active

bar/°C:
- pressure mode: on → pressure unit is bar
- temperature mode: on → temperature unit is °C

psi/°F:
- pressure mode: on → pressure unit is psi
- temperature mode: on → temperature unit is °F

9. Operating

Pressure mode:
In this mode, the pressures LP an HP are displayed in the selected unit.

Temperature mode:
By pressing the button ▲ the pressure mode and the temperature mode can be changed.
After 20 seconds the temperature mode will be selected automatically.

Setting mode:
By pressing and holding the button ● the setting mode will be selected. With the buttons ▲ and ▼ the parameters can be changed. By short pressing in single steps and by holding the buttons at increased speed.

By briefly pressing the button you can navigate in the menu:

PAS ● ↓ → ▲ or ▼ in single steps → ● → to the next digit
holding for quitting or skipping the password
check password, if the pasword matches you can change the following parameters

HPS ● ↓ → ▲ or ▼ 0.0...50.0 bar in 0.1 bar steps / 0...725 psi in single steps

Hdt ● ↓ → ▲ or ▼ 0....200 s in single steps

HPd ● ↓ → ▲ or ▼ 0.0...50.0 bar in 0.1 bar steps / 0...725 psi in single steps

HPC ● ↓ → ▲ or ▼ 0.0...50.0 bar in 0.1 bar steps / 0...725 psi in single steps

HIF ● ↓ → ▲ or ▼ 0.0...50.0 bar in 0.1 bar steps / 0...725 psi in single steps

FAN ● ↓ → ▲ or ▼ ON/OFF

FHP ● ↓ → ▲ or ▼ 0.0...50.0 bar in 0.1 bar steps / 0...725 psi in single steps

FLP ● ↓ → ▲ or ▼ 0.0...50.0 bar in 0.1 bar steps / 0...725 psi in single steps

FLL ● ↓ → ▲ or ▼ 0....100 % in single steps

LPS ● ↓ → ▲ or ▼ -1.0...19.0 bar in 0.1 bar steps / -14...+275 psi in single steps

LIF ● ↓ → ▲ or ▼ 0.0...20.0 bar in 0.1 bar steps / 0...290 psi in single steps

Ldt ● ↓ → ▲ or ▼ 0....200 s in single steps

HHA ● ↓ → ▲ or ▼

LHA ● ↓ → ▲ or ▼

GAS → ▲ or ▼

UNT → ▲ or ▼

C-F → ▲ or ▼

ADD → ▲ or ▼ 0...255 in single steps

RES → ▲ or ▼ holding → reset all changeable parameters to default values

END → ▲ or ▼ → end setting mode, switch to pressure mode
Setting mode starts from beginning at HPS

The setting mode will be leaved automatically if no button is pressed for 20 seconds and the pressure mode will be selected. By pressing and holding ● the setting mode will be leaved and the pressure mode will be selected.

10. Parameters

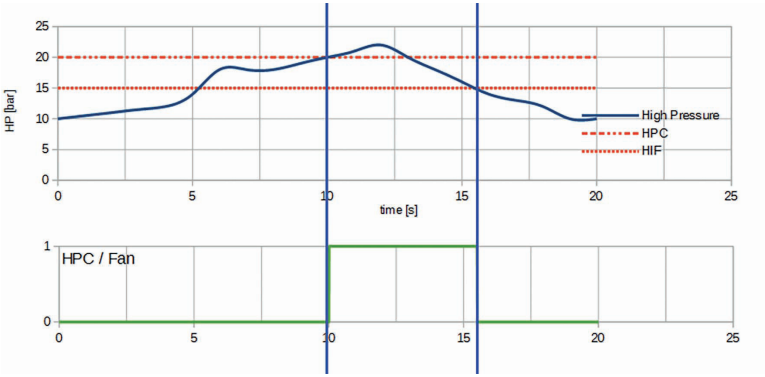
Label	Name	Threshold value	Standard value
HPS	High Pressure Switch	0.0...50 bar / 0...725 psi	30.0 bar / 435 psi
Hdt	Delay Timer for HPS Data	0...200 s	0 s
HPd	Differential Pressure value for HPS Data	0.0...50.0 bar / 0...725 psi	3.0 bar / 43 psi
HPC	Fan Pressure Control	0.0...50.0 bar / 0...725 psi	20.0 bar / 290 psi
HIF	Differential Pressure value for HPC Data	0.0...50.0 bar / 0...725 psi	5.0 bar / 73 psi
FAN	Fan Control	ON/OFF	OFF
FHP	Fan High Pressure (HP)	0.0...50.0 bar / 0...725 psi	20.0 bar / 290 psi
FLP	Fan Low Pressure (LP)	0.0...50.0 bar / 0...725 psi	5.0 bar / 73 psi
FLL	Fan Low Level	0...100 %	15 %
LPS	Low Pressure Switch	-1...19 bar / -14...+275 psi	7.0 bar / 102 psi
LIF	Differential Pressure value for LPS Data	0.0...20.0 bar / 0...290 psi	2.0 bar / 29 psi
Ldt	Delay Timer for LPS Data	0...200 s	0 s
HHA	Selection Mode for Automatic & Manual	A: automatic / H: manual	A
LHA	Selection Mode for Automatic & Manual	A: automatic / H: manual	A
GAS	Select the gas type	R22, R23, R134a, R404a, R407c, R407f, R410a, R448a, R449a, R507	R22
Unt	Select the pressure unit	bar, psi	bar
C-F	Select the temperature unit	°C, °F	°C
Add	Communication Adress for RS-485	0...255	2
RES	Reset all parameters to default values	---	---
End	Press the arrow button to exit	---	---

11. Switching characteristics HPC

HPC with the following setted parameters:

HPC: 20 bar

HIF: 5 bar



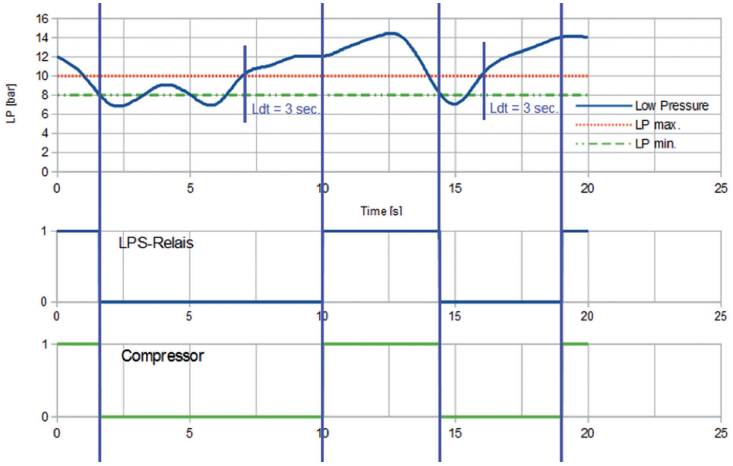
12. Switching characteristics LPS

LPS with the following setted parameters:

LPS: 10 bar

Ldt: 3 seconds

LIF: 2 bar



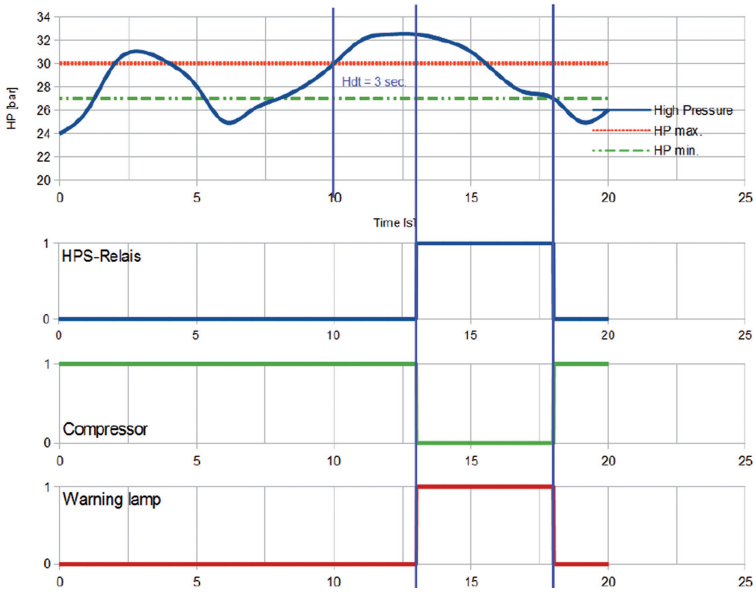
13. Switching characteristics HPS

HPS with the following setted parameters:

HPS: 30 bar

Hdt: 3 seconds

Hpd: 3 bar



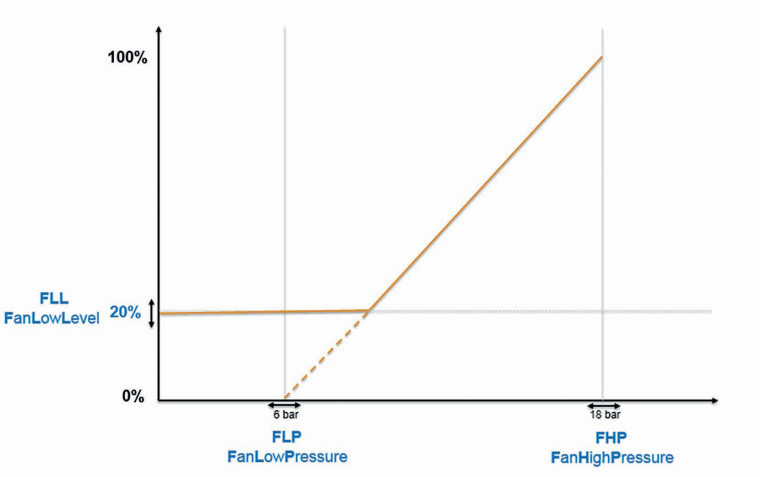
14. Fan control

Analog output FANCONTROL with the following setted parameters:

FHP: 18 bar

FLP: 6 bar

FLL: 20 %



15. RS-485 (Modbus RTU)

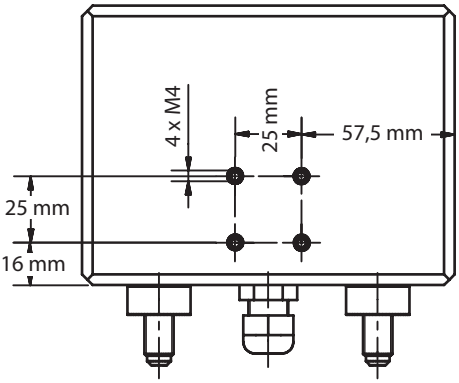
Data Communication:	RS485, Start-Stop synchronized serial interface
Baudrate:	9600 bps
Data lenght:	8 bit data
Stop bit:	1 Stopbit
Parity:	None parity

For further information please call/contact the manufacturer (for telefon number/adress see below).

16. Disposal

Old devices must not be disposed of with household waste.
For disposal, return the old device to the dealer where it was purchased.
The device must be disposed of in accordance with legal regulations.

17. Wall mounting



wall bracket

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