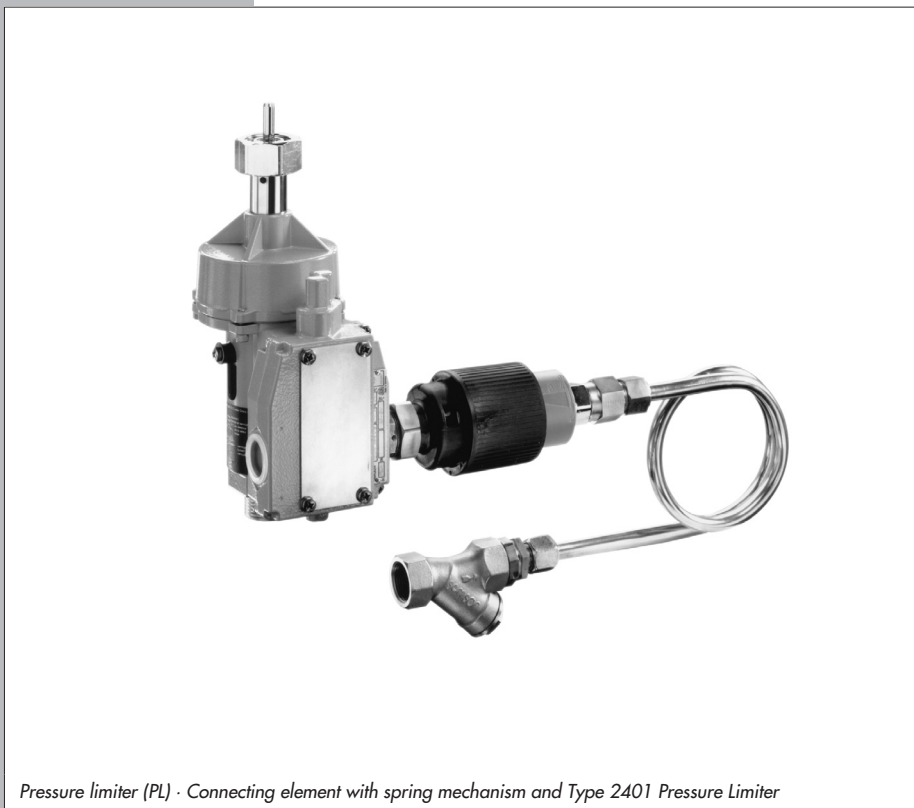


# Pressure Limiters (PL) with Type 2401 Pressure Element



*Pressure limiter (PL) · Connecting element with spring mechanism and Type 2401 Pressure Limiter*

## Mounting and Operating Instructions

**EB 2519 EN**

Edition August 2007



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## Definitions of the signal words used in these instructions

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### **CAUTION!**

*CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.*

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### **Note:**

*Supplementary explanations, information and tips*

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### General safety instructions

- ▶ *The regulators must be installed, started up and serviced by fully trained and qualified personnel only, observing the accepted industry codes and practices. Make sure employees or third persons are not exposed to any danger. All safety instructions and warnings in these instructions, particularly those concerning installation, start-up, and maintenance, must be observed.*
- ▶ *The regulator complies with the requirements of the European Pressure Equipment Directive 97/23/EC. The declaration of conformity issued for a valve bearing the CE marking includes information on the applied conformity assessment procedure. The declaration of conformity can be provided on request.*
- ▶ *For appropriate operation, make sure that the regulator is only used in applications where the operating pressure and temperatures do not exceed the operating values based on the sizing data submitted in the order.*
- ▶ *Note that the manufacturer does not assume any responsibility for damage caused by external forces or any other external factors. Any hazards which could be caused in the regulator by the process medium or operating pressure are to be prevented by means of appropriate measures.*
- ▶ *Proper shipping and appropriate storage are assumed.*



### Typetesting

*The pressure element has been typetested in conjunction with a valve by the German Technical Inspectorate (TÜV) according to DIN 3430. The test mark is available on request.*

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### 1 Design and principle of operation

The standard Type 2401 Pressure Element is used in combination with Type 2111, 2114, 2118 and 2119 Valves to make a pressure limiter.

The Type 2401 Pressure Element with its connecting element (8) is connected to the bellows housing of the valve by the connection nut (7).

The medium passes through the strainer (13) and the connecting tube (12) to an operating bellows in the Type 2401 Pressure Element (9). It is converted here into a positioning force which is compared to the force of a spring.

This spring force depends on the limit value adjustment (10). If the actual pressure exceeds the limit value adjusted, the spring mechanism in the connecting element (8) is released. It moves the pin (6) and the plug stem (5) attached to it, closing and locking the valve. It can only be reset and put back into

operation with the appropriate tool (lever tool 1490-7399) when the pressure has fallen below the limit.

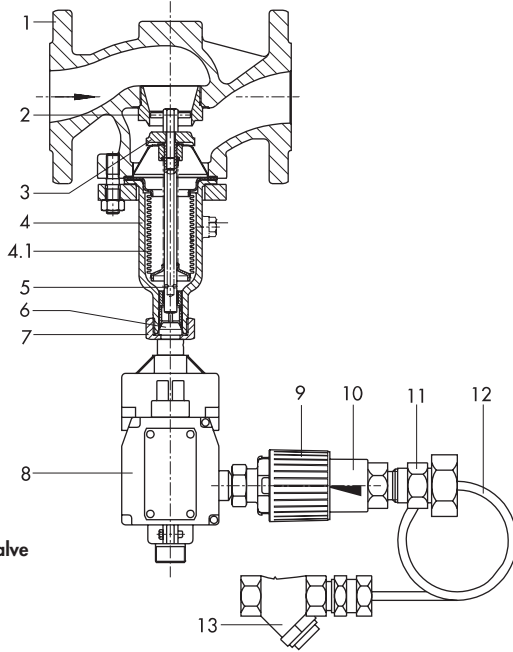
Additionally, a thermostat or safety thermostat to regulate or limit the temperature can be fitted to the connecting element (8).

Furthermore, supplementary units such as an electromagnetic release device and/or an electric signal transmitter can be connected.

The pressure element has been type tested in conjunction with a valve by the German Technical Inspectorate (TÜV).



Fig. 1 · Type 2401 Pressure Element (without connecting element and spring mechanism)



**Type 2111/2114/2118/2119 Valve**

- 1 Valve body
- 2 Seat
- 3 Plug
- 4 Bellows housing
- 4.1 Balancing bellows
- 5 Plug stem with spring

**Type 2401 Pressure Limiter**

- 6 Pin of spring mechanism
- 7 Connection nut G 1
- 8 Connecting element with spring mechanism
- 9 Type 2401 Pressure Element
- 10 Limit value adjustment
- 11 Screw fitting with Type 2401 Pressure Element
- 12 Connecting tube
- 13 Strainer

**Electrical accessories**

- 14 Electric signal transmitter
- 15 Electromagnetic release

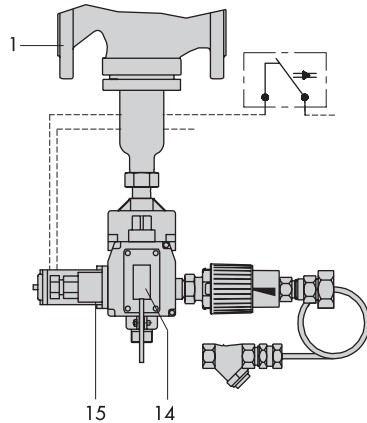


Fig. 2 · Functional drawings

## 2 Installation

The Type 2401 Pressure Element is installed in the pipeline together with a Type 2111, Type 2114, Type 2118 or Type 2119 Valve to make a Type 211.../2401 Pressure Limiter (PL).

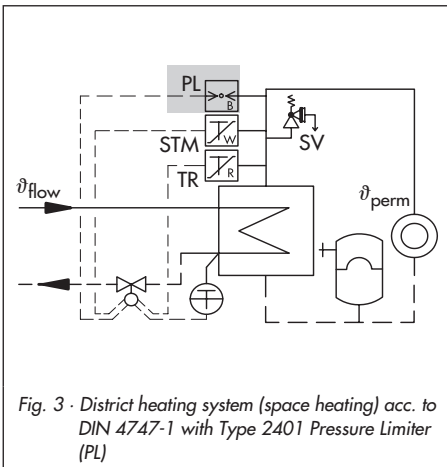
**Type 2111/2401** · With Type 2111  
Globe Valve

**Type 2114/2401** · With Type 2114  
Globe Valve

**Type 2118/2401** · With Type 2118  
Three-way Valve

**Type 2119/2401** · With Type 2119  
Three-way Valve

The pressure limiter can also be combined with Series 42 Regulators.



The pressure limiter and valve are delivered in separate packaging and must be fitted together either before or after installing the valve in the pipeline.

The spring mechanism is released of tension in the delivered state. The device is locked.

To mount it to the valve, the connection with the spring mechanism pin must be slightly pushed inwards before the connection nut can engage properly. After assembling the connecting element, unlock the device (see section 3.1).

### CAUTION!

*Prior to installing or removing the pressure limiter and valve from the pipeline, relieve the corresponding part of the plant from pressure and drain it, if necessary.*

## 2.1 Position of installation

Make sure that the maximum permissible ambient temperature of +80 °C (+60 °C when an electromagnetic release device is used) is not exceeded.

- ▶ Install the valve in horizontal pipelines.
- ▶ Install the connecting element suspended downwards.
- ▶ Make sure that the medium flows in the same direction as indicated by the arrow on the valve body

### 2.1.1 Combination with Series 42 Regulators

The Type 2401 Pressure Limiter can also be used in combination with Series 42 Differential Pressure and Flow Regulators.

To connect the actuator (Type 2424, 2427, 2428 and 2429) to the connecting element of the pressure limiter, a distance piece listed in Table 1 is required.

**Table 1** · Distance pieces

Distance piece	Order no.
Brass · For water	1590-9948
Stainless steel · For water	1590-7703
Stainless steel · For oil	1590-7704

**Note:**

Prior to installation, remove the circlip from the pin of the distance piece.

## 2.2 Connecting tube

A connection socket G $\frac{3}{8}$  must be fitted in the secondary circuit as shown in the schematics in Fig. 3 for tapping the pressure. The strainer of the connecting tube is screwed on tightly at this point.

- ▶ Route the connection lines to ensure that they cannot be damaged.
- ▶ Ensure the strainer and pressure element are screwed tightly together.

## 2.3 Electrical accessories

Additionally, an electromagnetic release device and/or an electric signal transmitter can be attached to the connecting element with spring mechanism.

### 2.3.1 Electromagnetic release device

The lifting magnet of the electromagnetic release device is connected to a safety interlock circuit. It is energized in normal operation. When the electric current is interrupted, the solenoid releases the spring mechanism, closing and locking the valve.

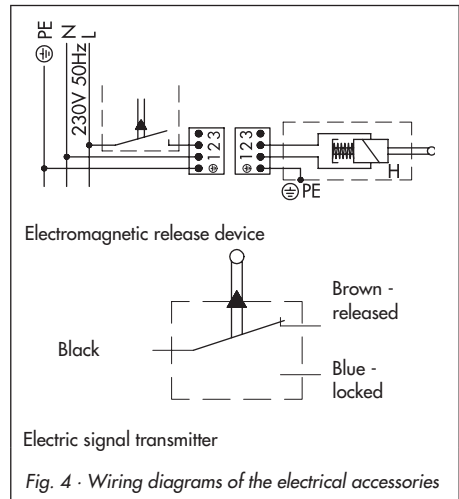


Fig. 4 · Wiring diagrams of the electrical accessories

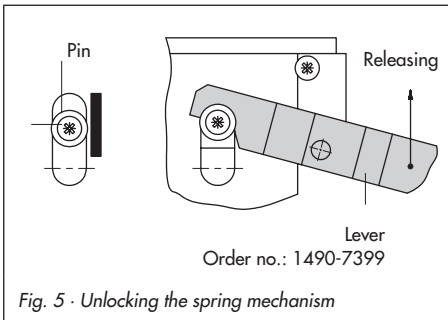
### 2.3.2 Electric signal transmitter

The signal transmitter contains a microswitch (max. load 10 A, 125/250 V) which issues a signal when the limit value is exceeded for remote transmission of the plant status.

### 3 Operation

#### 3.1 Unlocking the pressure element

To unlock the pressure element, the pressure must fall below the limit value again. Use the supplied lever as shown in Fig. 5 to pull up until the spring mechanism engages. The pins at the side are pushed downwards and the spring assembly pressed together.

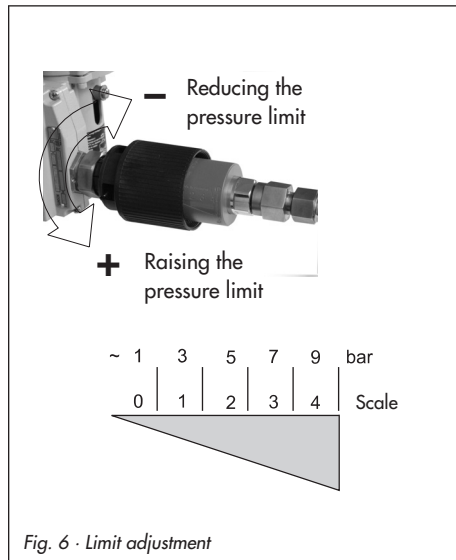


**Note:**

The lifting magnet of the electromagnetic release device must be energized.

#### 3.2 Adjusting the pressure limit value

Adjust the required limit by turning the black plastic ring according to the scale 0 to 4 (Fig. 6) (limit range between 1 and 10 bar). Turn it counterclockwise to increase the limit value and clockwise to reduce it. One turn causes the limit to change by approximately 0.4 bar.



### 3.3 Version functioning as a safety pressure element

The safety pressure element fulfills the requirements concerning extended safety stipulated in DIN 3440.

In the event of a malfunction, for example when the adjusted pressure limit is reached, the connecting tube breaks or the pressure measuring system leaks, the valve is closed and locked by the spring mechanism.

#### 3.3.1 Unlocking the safety pressure element

To unlock after a malfunction, it first has to be remedied.

To unlock, apply a pressure of at least 1 bar to the connection of the connecting line. Place the supplied lever as shown in Fig. 5 and pull it up until the spring mechanism engages. The pins at the side are pushed downwards.

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**Note:**

*The lifting magnet of the electromagnetic release device must be energized.*

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## 4 Customer service

Should any malfunctions or any defect occur, SAMSON's After-Sales Service is prepared to help you on site. You can also send the defect regulator directly to your local SAMSON representative for repair. Addresses of SAMSON subsidiaries, agencies and service centers are listed in the product catalogs and in the Internet at [www.samson.de](http://www.samson.de).

To allow SAMSON to find the error and to have an idea of the installation situation, we kindly ask you to specify the following details:

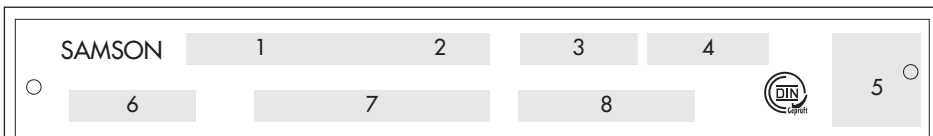
- ▶ Type and nominal size of the valve
- ▶ Configuration ID of Type 2401/valve
- ▶ Upstream and downstream pressure
- ▶ Temperature and control medium
- ▶ Min. and max. flow rate
- ▶ Has a strainer been installed?

Sketch of the installation with exact position of regulator and all additional installed components (shut-off valves, pressure gauges, etc.).

## 5 Technical data

Type 2401 Pressure Limiter with pressure element	
Adjustment range of limit value	1 to 10 bar
Max. permissible operating pressure	10 bar
Max. permissible operating temperature	+200 °C
Max. permissible ambient temperature with electromagnetic release device	+80 °C +60 °C
Switching cycles acc. to DIN 3440	500
Connecting tube Length	Approx. 2 m
Strainer	Type 1 NI, G 3/8 (refer to Data Sheet T 1010 EN)
Electromagnetic release device	
Power supply	230 V +5/-10%, 50 Hz or 24 V-
Degree of protection	IP 54
Power consumption	31 VA
Electric signal transmitter	
Permissible load	230 V~, 10 A at resistive load

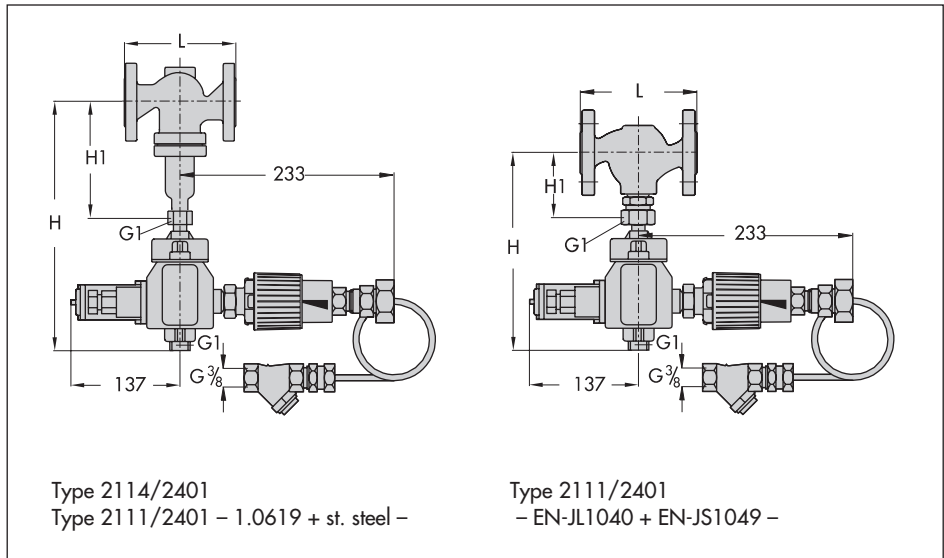
## 6 Nameplate



- |   |                     |   |                                 |
|---|---------------------|---|---------------------------------|
| 1 | Type                | 6 | Size (50/150)                   |
| 2 | Configuration ID    | 7 | TÜV no.                         |
| 3 | Date of manufacture | 8 | Adjustment range of limit value |
| 4 | Unassigned          |   |                                 |
| 5 | Unassigned          |   |                                 |

Fig. 7 · Nameplate

## 7 Dimensions



**Table 1** · Dimensions in mm  
**Type 2114/2401**

Connection	DN	15	20	25	32	40	50	65	80	100	125	150	200 <sup>1)</sup>	250 <sup>1)</sup>
Length L		130	150	160	180	200	230	290	310	350	400	480	600	730
H1	Without extension	225						300	355	460	590	730		
	With	365						440	495	600	730	870		
Weight (PN 16) <sup>2)</sup> in kg		5	5.5	6.5	13	13.5	16	27	32	40	70	113	255	300

<sup>1)</sup> On request

<sup>2)</sup> +15 % for PN 25/PN 40

**Type 2111/2401**

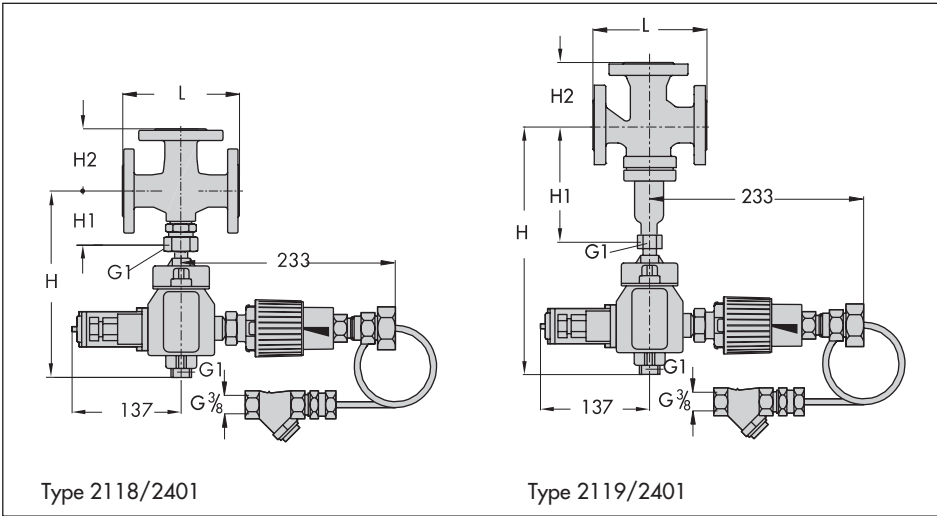
Connection	DN	15	20	25	32	40	50	
Length L		130	150	160	180	200	230	
H1	Without extension	225 <sup>1)</sup>   82 <sup>2)</sup>			225 <sup>1)</sup>   152 <sup>2)</sup>			-
	With	365 <sup>1)</sup>						
Weight (PN 16) <sup>3)</sup> in kg		5	5.5	6.5	13	13.5	16	

<sup>1)</sup> Valve material: 1.0619, stainless steel

<sup>2)</sup> Valve material: EN-JS 1049, EN-JL 1040

<sup>3)</sup> +15 % for PN 25/PN 40

## Dimensions



**Table 2 · Dimensions in mm**  
**Type 2118/2401**

Connection	DN	15	20	25	32	40	50	
Length L		130	150	160	180	200	230	
H2		70	80	85	100	105	120	-
H1		78		88				
Weight (PN 16) <sup>1)</sup> in kg		6	7	8.5	12.5	14.5	17	

<sup>1)</sup> +15 % for PN 25/PN 40

**Type 2119/2401**

Connection	DN	15	20	25	32	40	50	65	80	100	125	150	
Length L		130	150	160	180	200	230	130	140	150	200	210	
H1	Without extension	235		245		320		355	395	500			-
	With extension	375		385		460		495	535	640			
Weight (PN 16) <sup>1)</sup> in kg		6	7	8.5	15	17	19	32	50	71	On request		

<sup>1)</sup> +15 % for PN 25/PN 40





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