



**ETI-Elettrindustria Srl.**

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Specification N° SPR/

**10VSGENR02-E**

Accessory:

**Pressure relief valve Series VS**

Page N°:

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Title:

**Function, features, operation and assembly**

Revision:

**02 – 29/10/01**

## 1.0 Function, features, operation and assembly

This specification concerns the function, the main features and the operation of the accessory concerned, as well as the admitted environmental and operating condition for the different executions. Operating conditions depend generally from the compatibility of the materials, components, surface finish, and, for the electric contacts and circuits, their degree of protection, with the operating conditions of the transformer.

## 2.0 Function

The pressure relief valve opens when the pressure inside the tank increases over the set operating value, following for example a failure or a short circuit, and by releasing oil reduces the pressure in the tank. By means of the electric contact, if present, and the optical indication the pressure relief valve indicates that a fault has taken place.

## 3.0 Construction features

### 3.1.0 Materials and components

- Flange, obturator, cover and electric contact's casing are of cast aluminium;
- Fittings are of stainless steel or nickel coated brass;
- Gasket materials as specified for the different executions;
- Splash diverter is made of stainless steel;
- Springs are of spring steel, sandblasted and painted with epoxy powders;
- External screws are of stainless steel.

### 3.2.0 Reference drawings

Overall dimensions:

Pressure relief valves with contact type K

- Type VSQI 050 NKP - nominal diameter 50 mm N° 10.050.710
- Type VS 080 NKP - nominal diameter 80 mm N° 10.080.90
- Type VS 100 NKP - nominal diameter 100 mm N° 10.100.90
- Type VS 150 NKP - nominal diameter 150 mm N° 10.150.90

Pressure relief valves with contact type C

- Type VS 080 NCP - nominal diameter 80 mm N° 10.080.10
- Type VS 100 NCP - nominal diameter 100 mm N° 10.100.10
- Type VS 150 NCP - nominal diameter 150 mm N° 10.150.10

Pressure relief valves without contact

- Type VSQI 050 N - nominal diameter 50 mm N° 10.050.705

The drawings show the valves complete with splash diverter.

### 3.3.0 Construction

The pressure relief valves Series VS are spring operated safety valves, consisting of a mounting flange with the central opening closed by a spring loaded obturator; the springs are compressed between obturator and cover, which is assembled to the flange by columns.

No part of the pressure relief valve reaches inside the transformer tank. A specially designed gasket assures the oil-tightness between flange and obturator when the valve is closed.



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Specification N° **SPR/**

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### 3.4.0 Pressure setting and springs

The setting of the pressure relief valves Series VS is effected by choosing a different spring - for Type VS 150 a double spring set – for every operating pressure value; therefore the setting of the pressure relief valve can be changed only at the factory, thus eliminating possible misuses.

The springs are of the compression type, designed so as to have a limited force gain with the stroke.

Specification N° **SPR/10VSTARRx** indicates the tolerance of the setting and the minimum operating pressure for the different pressure settings as well as the minimum pressure at which the valve closes after operation.

### 3.5.0 Operation indication

#### 3.5.1.0 Optical indication

The pressure relief valves Series VS have as a standard feature an optical indication that the valve has operated; this optical indication consists of a red pin showing about 30 mm over the top of the valve cover when the valve has operated because of an internal overpressure. For valves Type VS 080, VS 100 and VS 150 the pin is spring loaded so that even in case of partial openings of the valve due to small or short-duration overpressures the pin is nevertheless expelled completely. For Type VSQI 050 the optical indication operates also the electric contact, if present.

#### 3.5.2.0 Electric contact

The operation of the pressure relief valve can be indicated also by an electric contact, which can be of the “C” type, according to specification N° **SPR/10VSSCHCRxx** or of the “K” type according to specification N° **SPR/10VSSCHKRxx**.

### 3.6.0 Splash diverter

To avoid that during the operation of the valve hot oil is shot in all directions, thus increasing the danger to man and machine, the valves Series VS can be fitted with a splash diverter, which diverts the out-flowing oil in a determined direction.

### 3.7.0 Oil-tightness and resistance to pressure

The pressure relief valves Series VS:

- are oil tight to oil at 100°C up to pressure  $P_t$ , which depends on the setting pressure;
- are mechanically and electrically resistant to vacuum (10 torr);
- have a mechanical resistance to pressures up to 4 bars.

### 3.8.0 Resistance to dynamical stress

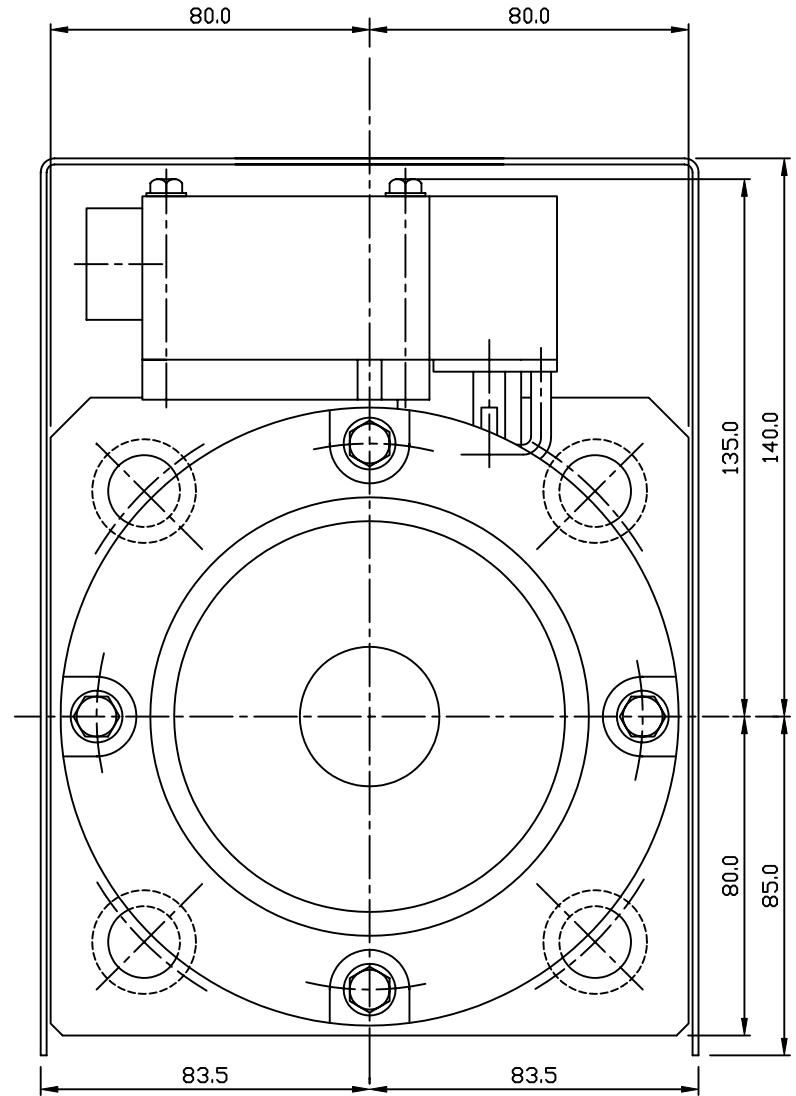
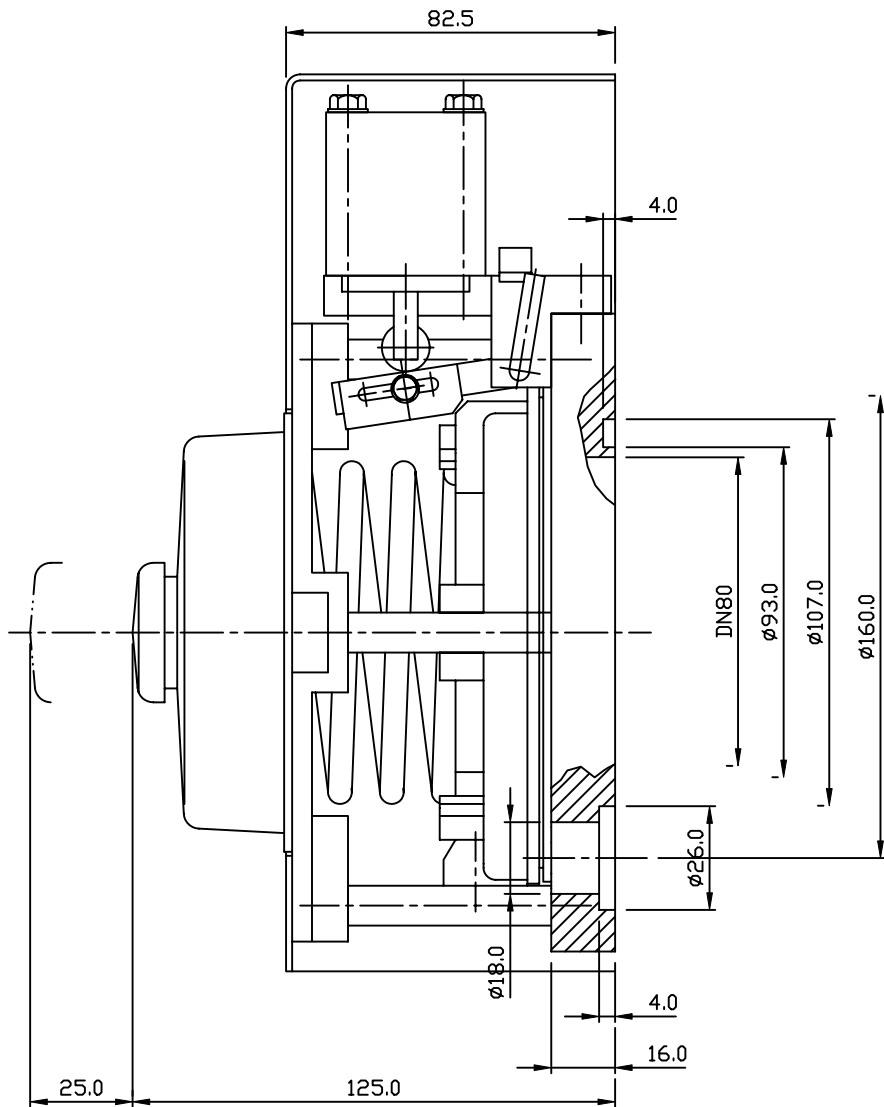
The pressure relief valves Series VS can operate without undue operation in following conditions:

- Sinus vibrations with frequency  $\leq 120$  Hz and amplitude  $\leq 250 \mu$ ;
- Dynamical conditions causing following accelerations:
  - ◇ Max 3g in all directions, sinus vibration, amplitude  $\leq 20$  mm;
  - ◇ Shock condition with max 10 g in all directions.


### 3.9.0 Surface protection

Flange, obturator, cover and contact's casing are painted internally and externally with one primer coat of epoxyd paint and externally with a finishing coat of polyurethane paint colour RAL 7031. The primer coat on the internal surfaces in contact is compatible with transformer mineral oil up to temperatures of 120°C.

The painting procedure is accepted by the Italian electricity authority ENEL.

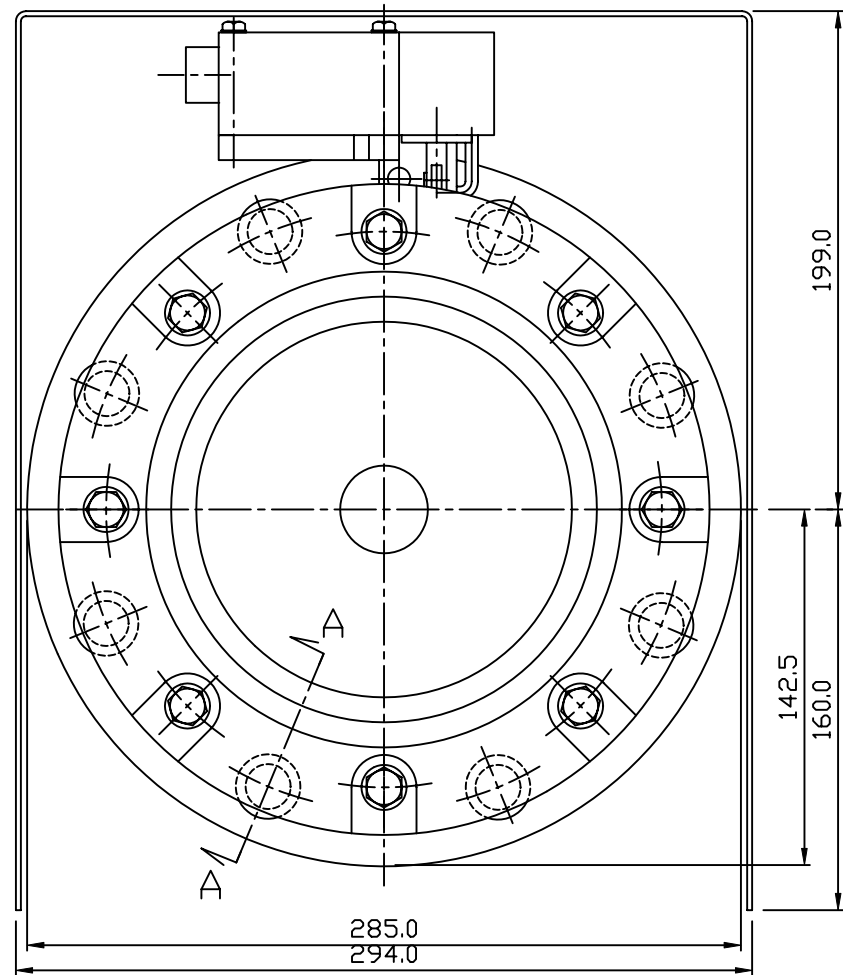
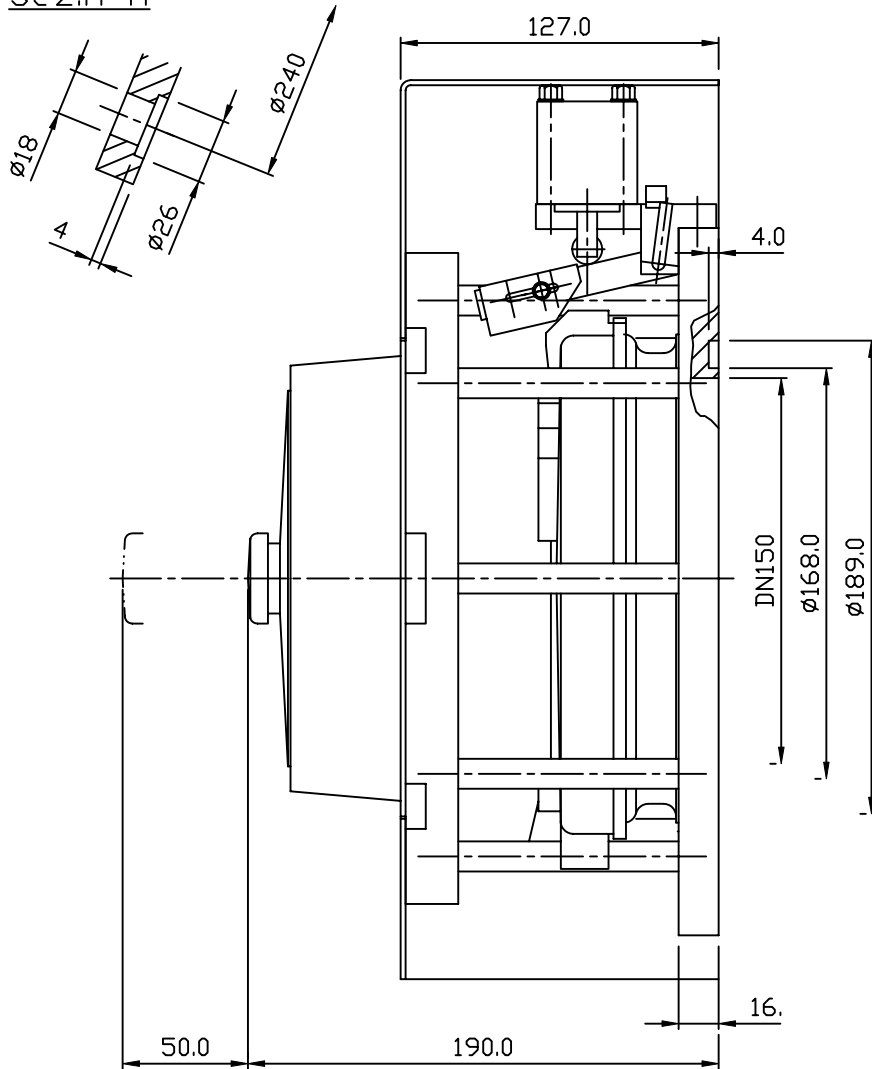


N.rev	Nota sulla revisione	Data	Signatura	Controllo
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Rif.	Quantità	Titolo/Nome, designazione, materiale, dimensione, etc.			N. articolo/Riferimento	
Progettato da	Controlato da	Approvato da - data	Nome file	Data	Scala	
<b>Proprietario</b>  <b>ETI ELETTRINDUSTRIA S.p.A.</b> 20032 CORMANO ITALY			<b>Titolo/Nome</b> VALVOLA DI SICUREZZA - SIOUPE DE SECURITE - SAFETY VALVE TIPO-TYPE VS080NCP			
Numero disegno			10.080.10	Modifica	Foglio	

Riproduzione vietata Non misurare le quote dal disegno

Sez.A-A



A	Aggiunta Sez.A-A ed evidenziato fori fissaggio a cassa	20-05-99	GL	
N.rev	Nota sulla revisione	Data	Signatura	Controllo

Rif.	Quantità	Titolo/Nome, designazione, materiale, dimensione, etc.			N. articolo/Riferimento	
Progettato da	Controllato da	Approvato da - data	Nome file	Data	Scala	//
				Titolo/Nome VALVOLA DI SICUREZZA Tipo - Type SAFETY VALVE VS150NCP SOUPEPE DE SECURITE		
Numero disegno				10.150.10	Modifica	A
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Riproduzione vietata		Non misurare le quote dal disegno				