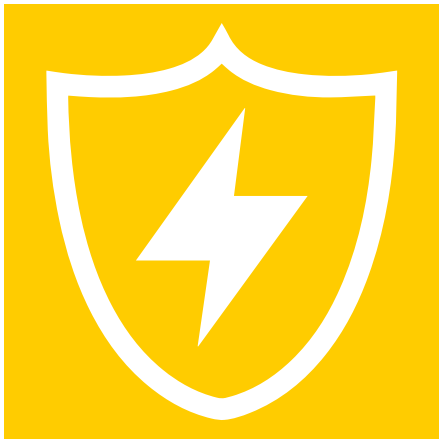
# 4.5



# SURGE PROTECTION

## S400 Series

# S400 SERIES

## High-efficiency surge protection

The SENECA **S400** surge protection devices are designed to protect electrical systems and equipment against transient and impulsive over-voltages caused by atmospheric phenomena and electrical maneuvers. The S400 series includes:

- **Type 2 and 3 surge arresters for industrial power supply systems**
- **Protections for control, measurement, and regulation systems that can be used in binary and analog circuits, such as pulses, 0..10 Vdc signals, and 0/4..20 mA current loops**
- **Surge protection for computer and communication networks (Token Ring, ISDN, DS1, Ethernet, Power over Ethernet, RS232/422/485, etc.) with extremely high transmission speed and discharge capacity.**

S400HV-2

S400LV-1-N

K400CL

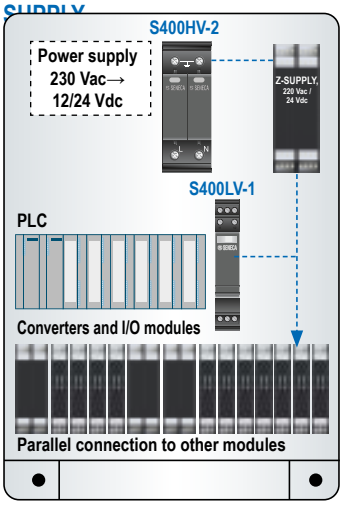
S400CL-1

S400CL-1-N

S400NET-1

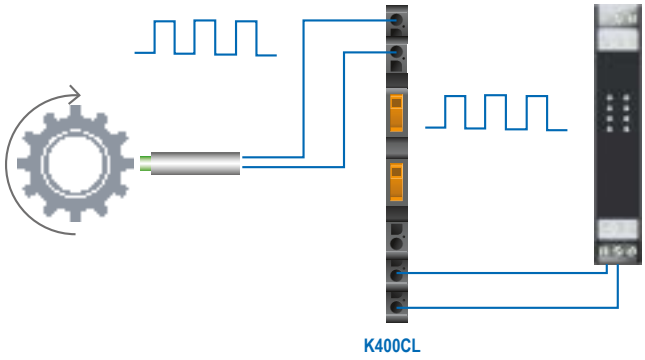
## APPLICATION EXAMPLES

### PROTECTION AND ISOLATION FOR TYPE 2 AND TYPE 3 POWER SUPPLY

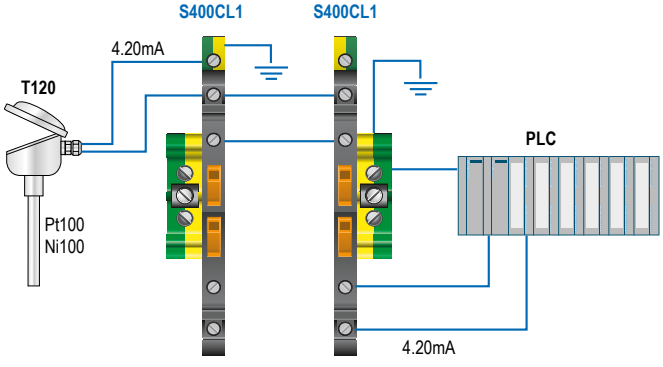



Automation panels, marshalling panels, PLC/DCS control panels, machine control panels, distribution boards, power center panels, MCC panels

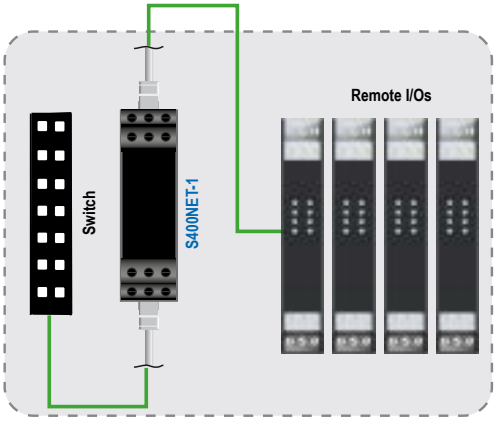
### PROTECTION FOR PULSE MEASUREMENT DEVICES (REED, NAMUR, PNP, NPN, HALL EFFECT, ETC.)




### PROTECTION OF AN ANALOG MEASUREMENT DEVICE




### PROTECTION OF IT SIGNALS




Ethernet connection with the switch located in the local Electrical Panel

## HIGH-EFFICIENCY INTELLIGENT SURGE PROTECTION

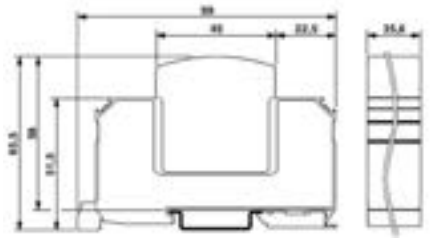
| | TYPE 2/3 PROTECTION FOR POWER SUPPLY SYSTEMS | | PROTECTION FOR MEASUREMENT AND CONTROL DEVICES | | | PROTECTION FOR COMPUTER NETWORKS AND TELECOMMUNICATIONS |
|---|---|---|---|---|---|---|
| | **S400HV-2** | **S400LV-1-N** | **K400CL** | **S400CL-1** | **S400CL-1-N** | **S400NET-1** |
| |  |  NEW |  |  UNTIL STOCKS LAST |  UNTIL STOCKS LAST COMING SOON |  |
| | **230 Vac surge protection, type 2 with 3 conductors (L, N, PE)** | **Surge protection type 3, nominal voltage: 24 V AC/DC** | **Surge protection for analog and logic signals, slim format 6.2 mm** | **Surge protection for analog and logic signals with knife switch** | **Surge protection with integrated status indicator and knife switch for a potential-free signal circuit with 2 wires** | **Surge protection for Ethernet networks, serial networks, and field bus with 5 wires** |
| **ELECTRICAL PROTECTION DATA (L-N / N-PE / L-PEN)** | | | | | | |
| **Test class IEC / Type EN** | II / T2 | III / T3 | C1 / C2 / C3 / D1 | C1 / C2 / C3 / D1 | C1 / C2 / C3 / D1 | C1 / C2 / C3 / D1 |
| **Nominal voltage $U_N$** | 240 / 415 Vac (TN-S); 240 / 415 Vac (TT) | 24 Vac (TN-S) | 24 Vdc | 24 Vdc | 24 Vdc | 5 Vdc |
| **Max permanent voltage $U_C$** | L-N 335 Vac (L-N); 260 Vac (N-PE) | 34 Vac | 36 Vdc / 25 Vac | 30 Vdc / 21 Vac | 30 Vdc / 21 Vac | 5.2 Vdc / 3.6 Vac |
| **Nominal discharge current In (8/20)µs** | L-N 20 kA / L-PE 20 kA / N-PE 20 kA | 1kA | (wire-to-wire) 5 kA / (wire-to-ground) 5 kA / 10 kA (total) | (wire-to-wire) 5 kA / (wire-to-ground) 5 kA | 5kA | (wire-to-wire) 10 kA / (wire-to-ground) 10 kA |
| **Max. Max discharge current Imax (8/20)µs** | L-N 40 kA / L-PE 40 kA / N-PE 40 kA | 1kA | (wire-to-wire) 10 kA / (wire-to-ground) 10 kA / 20 kA (total) | | 20kA | (wire-to-wire) 10 kA / (wire-to-ground) 10 kA |
| **Atmospheric test current $I_{imp}$ (10/350) µs per conductor** | | | 500A | 500A | 0.5kA | |
| **Nominal load current $I_L$** | 80A | 16 Aac (@63°C); 10 Adc | | | | |
| **Cumulative current (8/20)µs** | | | 20kA | 10kA | | 20kA |
| **Protection level Up** | L-N ≤ 1,5 kV / L-PE ≤ 1,8 kV / N-PE ≤ 1,5 kV | ≤ 0,18 kV (L-N) / ≤ 0,55 kV (L-PE) / ≤ 0,55 kV (N-PE) | (Conductor-to-conductor) 70 V (C2-10 kV / 5 kA / ≤50 V (C3-10A) / ≤80 V (D1 - 500 A) (Conductor-to-ground ≤650 V(C1-500 V / 250 A) / ≤700 V (C2-10 kV / 5 kA) / ≤700 V (D1 - 500 A) | (Conductor-to-conductor) ≤ 45 V (C1 - 500 V / 250 A ≤ 55 V /C2 - 10 kV / 5 kA) | (Conductor-to-conductor) ≤ 55 V (C1 - 1 kV / 500 A) ≤ 65 V (C2 - 10 kV / 5 kA) ≤ 50 V (C3 - 25 A) (Conductor-to-ground) ≤ 55 V (C3 - 100 A) ≤ 750 V (C1 - 1 kV / 500 A) ≤ 750 V (C2 - 10 kV / 5 kA) ≤ 700 V (C3 - 25 A) ≤ 750 V (C3 - 100 A) (Conductor-to-conductor) ≤ 50 V (C1 - 1 kV / 500 A) ≤ 65 V (C2 - 10 kV / 5 kA) (Conductor-to-ground) ≤ 750 V (C1 - 1 kV / 500 A) ≤ 750 V (C2 - 10 kV / 5 kA) | Conductor-to-conductor: ≤70 V (C1 - 1 kV / 500 A) ≤45 V (C3 - 25 A) ≤100 V (C2 - 10 kV / 5 kA) ≤70 V (6kV / 3 kA) Conductor-to-ground: ≤80 V /C1 - 1 kV / 500 A) ≤110 V (C2 - 10 kV / 5 kA) ≤100 V (6 kV / 3 kA) ≤45 V (C3 - 25 A) Conductor-GND: ≤45 V (C3 - 25 A) |
| **Residual voltage at 5 kA** | L-N ≤ 1,2 kV / L-PE ≤ 1,2 kV / N-PE ≤ 150 V | | | | | |
| **Combination wave Uoc** | | ≤ 25 ns | | | | |
| **Response time $t_A$** | L-N ≤ 25 ns / N-PE ≤ 100 ns | L-N ≤ 25 ns / L-PE ≤ 100 ns / N-PE ≤ 100 ns | (wire-to-wire) ≤1 ns / (wire-to-ground) ≤100 ns | (wire-to-wire) ≤1 ns / (wire-to-ground) ≤100 ns | | (wire-to-wire) ≤500 ns / (wire-to-ground) ≤500 ns |
| **ELECTRICAL PROTECTION DATA (L-N / N-PE / L-PEN)** | | | | | | |
| **Max prefuse for standard wiring** | 125 Aac (gG) | 16 Aac - 10 Adc | 315mA | 315mA | 630 mA (FF) | 500mA |
| **Max prefuse for pass-through wiring** | 80 Aac (gG) | | | | | |
| **Short-circuit resistance $I_{SCCR}$** | 25kA | | | | | |
| **Frequency limit fg (3dB) symmetric in the 50 Ohm system** | | | typ. 6 MHz | typ. 6 MHz | typ. 940 kHz | |
| **Conductor resistance** | | | 3.3 Ohm | 3.3 Ohm | 1.65 Ohm ±20% | 2.2 Ohm |
| **Limiting output voltage at 1 kV/ µs (spike/stat.)** | | | (wire-to-wire) ≤ 60V / (wire-to-ground) ≤ 650V | ≤45 V (wire-to-wire) / ≤650 V (wire-to-ground) | | Spikes (wire-to-wire): ≤ 55 V Spikes (wire-to-ground): ≤ 55 V (PT 2x2-BE) / ≤ 1 µA (on PT 2x2+F-BE) Static voltage (wire-to-wire) ≤ 15 V Static voltage (wire-to-ground): ≤ 15 V / ≤ 30 V (PT 2x2+F-BE) |
| **Dimensions (WxHxD)** | 35.6 x 90 x 58 mm | 17.7 x 90 x 65.5 mm | 6.2 x 93 x 102.5 mm | 6.2 x 94.8 x 69.1 mm | 6.2 x 105 x 83 mm | 17.7 x 90 x 65.5 mm |
| **Temperature range** | -40°C.. +80°C | -40°C.. +80°C | -40°C.. +80°C | -40°C.. +80°C | -40..+70°C | -40°C.. +85°C |
| **Protection class** | IP20 | IP20 | IP20 | IP20 | IP20 | IP20 |
| **UL 94 Combustibility class** | V0 | V0 | V0 | V0 | V0 | V0 |
| **Case Material** | PA 6.6 - PBT | PA 6.6 | PBT | PA 6.6 | PBT | PA |
| **Connection interface** | Screw connection | Screw connection | Screw connection | Screw connection | Push-in connections | Screw connection (with the base element) |
| **Certifications** | CE, UL | CE | CE, UL | CE, UL | CE | CE, UL |

The technical data and diagrams in this document are indicative and not binding.

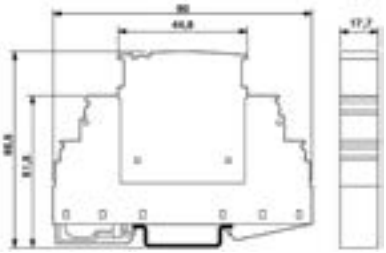
# S400 SERIES

## DIMENSIONS

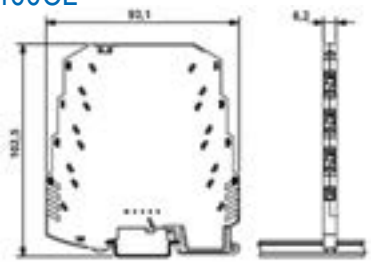
### S400HV-2



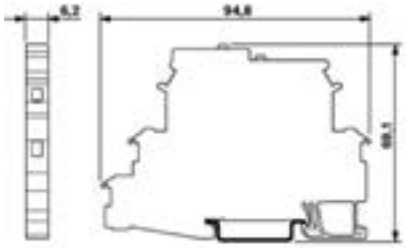
### S400LV-1-N



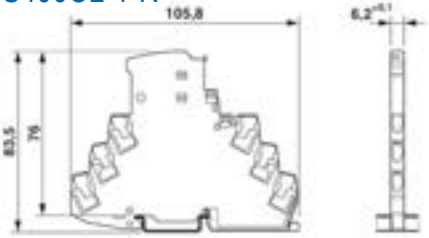
### K400CL



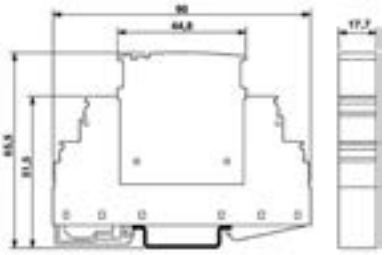
### S400CL1



### S400CL-1-N



### S400NET-1



## ACCESSORIES

### S400HV-2-RIC-SL

### S400HV-2-RIC-SN

### S400LV-1-RIC-SL

### S400LV-1-RIC-SL

## ORDER CODES

| Code | Description |
|---|---|
| **K400CL** | Surge protection for analog and logic signals, slim format 6.2 mm |
| **K400CL-10** | Kit 10 p.zi K400CL |
| **S400HV-2** | 230 Vac surge protection, type 2 with 3 conductors (L, N, PE) |
| **S400HV-2-RIC-SL** | Replacement plug 1L-N/PE for S400HV-2, without FM contact |
| **S400HV-2-RIC-SN** | Replacement plug N/PE for S400HV-2 |
| **S400LV-1** | Surge protection 24VAac/dc, with FM contact, type 3 with 3 conductors (L, N, PE) |
| **S400LV-1-RIC-SL** | Replacement plug 24VAC/DC for S400LV-1, with FM contact |
| **S400CL-1** | Surge protection for analog and logic signals with knife switch |
| **S400CL-1-15** | Kit 15 pcs S400CL-1 |
| **S400CL-1-P5** | Pack of 5 pcs closure walls for module S400CL-1 |
| **S400NET-1** | Surge protection for Ethernet networks, serial networks, and field bus with 5 wires |
| **S400NET-1-RIC-CL** | Replacement plug for S400NET-1 |
| **S400ETH-DSK** | Surge protection for Ethernet networks Class D/Cat.5 (100 Mbps)/5e (1 Gbps), PoE |