

Roof Switch for rolling stock
Type **RS**



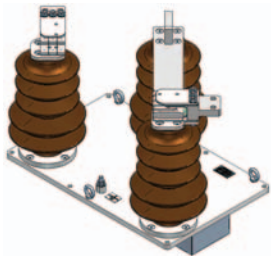
The **RS** is an off-load switch, electrically or electro-pneumatically operated, and designed to be installed outdoors on the roof of electric traction vehicles.

The **RS** is available in three main executions: change-over switch, disconnect switch, as well as disconnect and earthing switch.

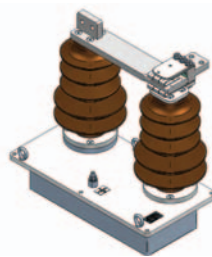
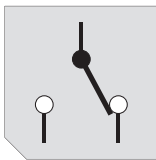
It is suitable for single-voltage as well as for multi-voltage vehicles, covering all the usual line voltages (1.5 kVdc; 3 kVdc; 15 kVac and 25 kVac) as well as the different vehicle's currents rated from 1000 A to 3000 A.

Applications

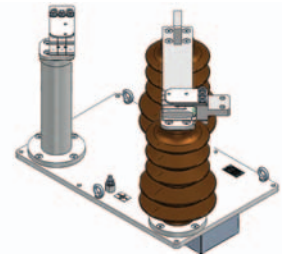
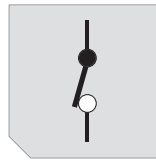
Roof switch for locomotives, trains and EMUs running on ac and/or dc networks.



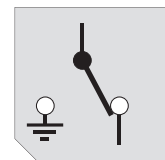
Change-over switch
Application C



Disconnect switch
Application D



Disconnect and earthing switch
Application E



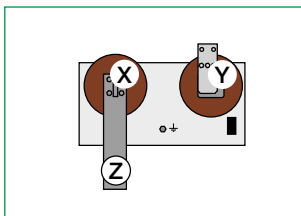
Main features

- Rated operational voltage up to 3.6 kVdc and 27.5 kVac
- Rated free air thermal current from 1000 A to 3000 A
- High insulation level: overvoltage category OV3 or OV4 (between poles) / OV4 (between poles and earthed base plate)
- High rated short-time withstand current to ensure a safe protection's coordination with the vehicle's main circuit-breaker performances
- Electric operation (electro-pneumatic in option)
- Suitable for vehicle speed up to 400 km/h
- Usable in various ranges of ambient temperature from -40°C to +70°C (-50°C to +70°C in option)
- Reference standards: IEC60077-1 /-2 /-4, IEC61373, EN50124-1; NF F16-101 /-102, DIN5510-5

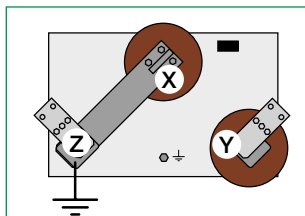
Poles configuration

Standard

Application D

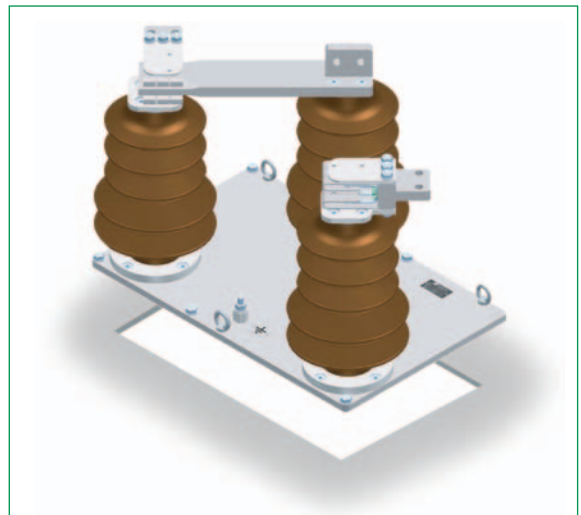


Application E



Roof execution

Roof opening



Technical data

Application	Symbol	Unit	RS25.10 C,D,E	RS25.20 C,D,E	RS25.30 C,D,E	RS03.10 C,D,E	RS03.20 C,D,E	RS03.30 C,D,E
MAIN HIGH VOLTAGE CIRCUIT								
Rated operational voltage	U _e	[kVac] ⁽¹⁾ [kVdc]	27.5 -	27.5 -	27.5 -	- 3.6	- 3.6	- 3.6
Rated insulation voltage	U _i	[kVac] ⁽¹⁾ [kVdc]	27.5 -	27.5 -	27.5 -	- 4.8	- 4.8	- 4.8
Conventional free air thermal current ⁽¹⁾⁽²⁾	I _{th}	[A]	1000	2000	3000	1000	2000	3000
Peak and rated short-time withstand current	ac:	\hat{I}_{cw}	63	63	63	-	-	-
		I _{cw}	25	25	25	-	-	-
		t	1	1	1	-	-	-
	dc:	\hat{I}_{cw}	63	100	142	63	100	142
		I _{cw}	44	70	100	44	70	100
		t	0.25	0.25	0.25	0.25	0.25	0.25
Overvoltage category								
- Pole-pole			OV3 or OV4			OV4		
- Pole-earth			OV4			OV4		
Rated power-frequency withstand voltage ⁽³⁾	U ₅₀	[kV _{rms}]			80		20	
Rated impulse withstand voltage (1.2 / 50 μs)	U _{imp}	[kV]	125 (OV3) / 170 (OV4)			40		

(1) For higher values, please contact Sécheron

(2) At T_{amb} = +40°C and tested with high voltage connections according to standard IEC/EN 60943

(3) At 50 Hz during 1 minute

LOW VOLTAGE AUXILIARY CIRCUIT

Control circuit

Type of operation			Electric or electro-pneumatic
Nominal voltage	U _n	[Vdc]	24, 36, 48/50, 72, 110
Range of voltage			[0.7 - 1.25] U _n
Electric version			
- Control power ⁽⁴⁾	P	[W]	125
Electro-pneumatic version:			
- Power ⁽⁴⁾			2.5 W
- Air flow			0.4 l / operation
- Operating pressure ⁽⁴⁾	p	[MPa]	0.4 - 1
Commutation time ⁽⁴⁾			≤ 3 s

(4) At U_n and T_{amb} = +20°C

Auxiliary contacts

Type of contacts (refer to definition page 7)			Change-over
Rated voltage		[Vdc]	24 to 110
Conventional thermal current	I _{th}	[A]	10
Maximum breaking capacity at 110 Vdc and τ=5 ms		[A]	6
Minimum let-through current at 24 Vdc ⁽⁵⁾		[mA]	10 (silver contacts)
		[mA]	4 (gold contacts)

(5) For dry and clean environment

Low voltage interface

Type of connection ⁽⁶⁾			1 connector: Harting HAN 24 DD
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(6) Refer to page 7 for mobile connector informations

Insulation

Rated power-frequency withstand voltage ⁽⁷⁾	U ₅₀	[kV _{rms}]	1.5
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(7) At 50 Hz and during 1 minute

OPERATING CONDITIONS

Installation			Outdoors
Altitude		[m]	<1400
Working ambient temperature			
- Electric operation	T _{amb}	[°C]	-40 to +70 (-50 to +70 in option)
- Electro-pneumatic operation	T _{amb}	[°C]	-25 to +70
Humidity			Class 5K2
Pollution degree			PD4
Minimum mechanical durability	N	Cycles	≥250'000
Protection index:			
- HV part			IP00
- LV part			IP00 (standard); IP3X (option) ⁽⁸⁾
- Tightness between upper and lower part when installed ⁽⁹⁾			IP65

(8) With LV protection cover

(9) Delivered with an O-ring seal

Main dimensions (standard version)

The DIN-ISO 2768-1 coarse tolerances are applied to these dimensions. All dimensions are in mm.

The maximum allowed flatness deviation of the support frame is 1 mm.

HV connections: M12 screws; earth connection: M10 screws.

Note! These views include the optional protecting cover for LV part.

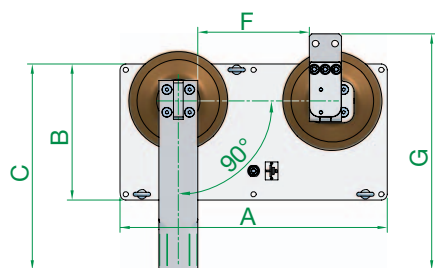
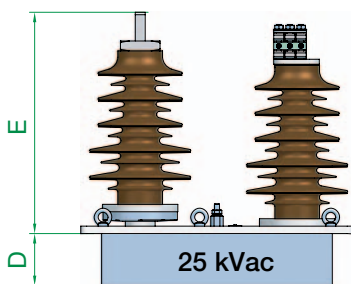
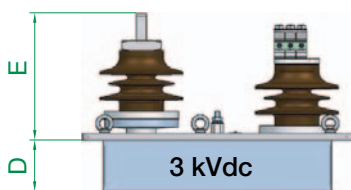
Applications D

OV3: RS25.. / OV4: RS03..

	RS..10	RS..20
A	550	550
B	280	280
C	413	424
D	105	105
E - RS25	425	444
E - RS03	239	258
F	255	231
G	462	486

OV4: RS25.. / OV4: RS03.30

	RS..10	RS..20	RS..30
A	630	630	630
B	280	280	280
C	493	504	578
D	105	105	105
E	425	444	444
F	335	311	311
G	542	566	640



25 kVac / 3kVdc

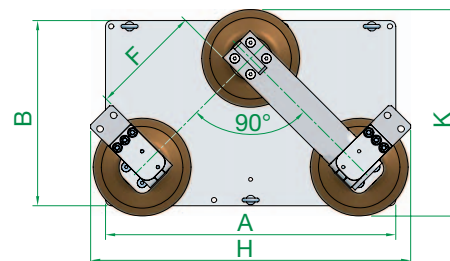
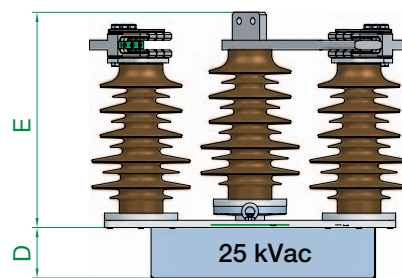
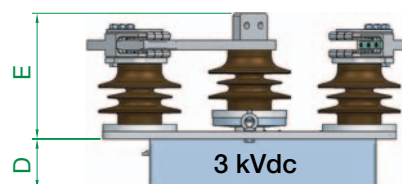
Applications C and E

OV3: RS25.. / OV4: RS03..

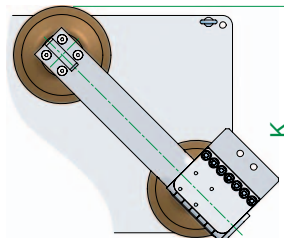
	RS..10	RS..20
A	605	605
B	386	386
D	105	105
E - RS25	425	444
E - RS03	239	258
F	253	234
H	645	669
K - RS25	430	430
K - RS03	396	396

OV4: RS25.. / OV4: RS03.30

	RS..10	RS..20	RS..30
A	713	713	713
B	440	440	440
D	105	105	105
E	425	444	444
F	330	310	310
H	753	777	881
K	484	484	485



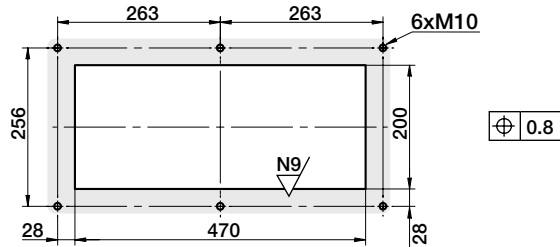
25 kVac / 3kVdc



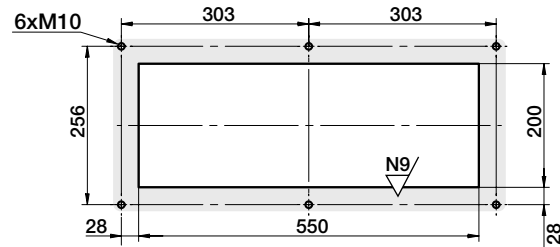
Roof / frame opening

Applications D

For dimensions A x B = 550 x 280 mm

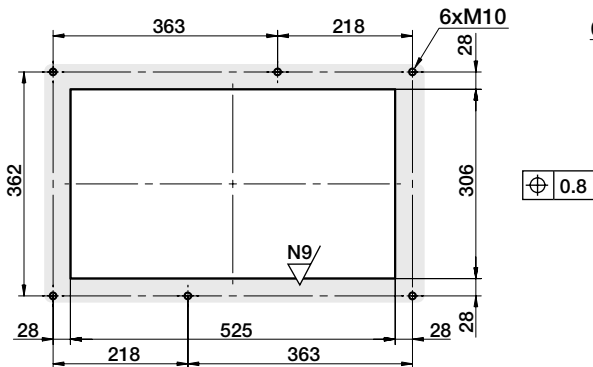


For dimensions A x B = 630 x 280 mm

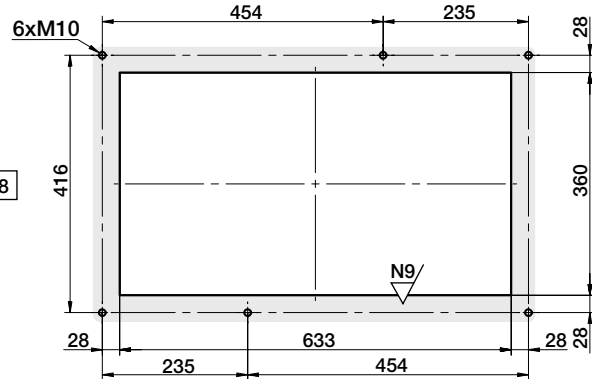


Applications C and E

For dimensions A x B = 605 x 386 mm

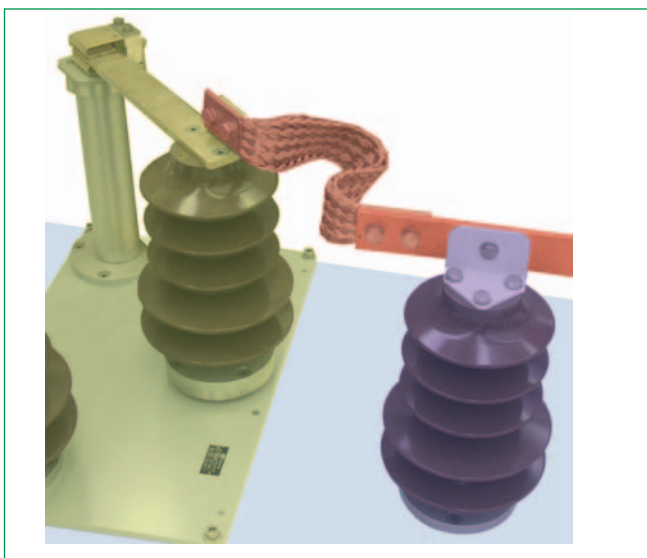


For dimensions A x B = 713 x 440 mm



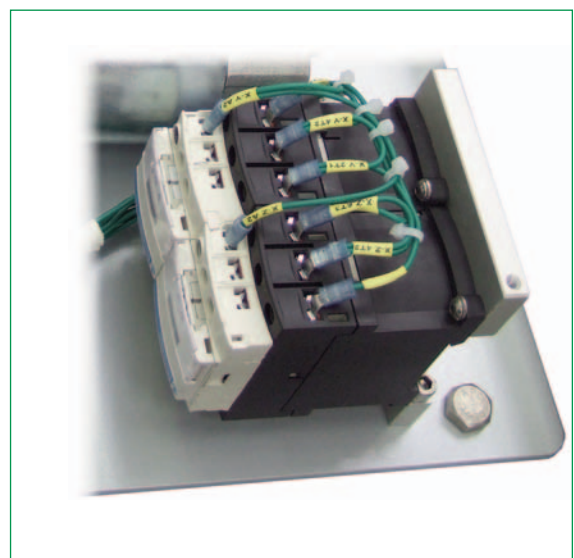
Technical Informations (for standard executions)

Standard way of connection to the moving knife



- Roof switch RS
 - Flexible connection (not in Sécheron's scope)
 - The isolator can be delivered by Sécheron upon request
- In case this connection type can not be used, please contact Sécheron for customized solutions.

Control equipment for electric version



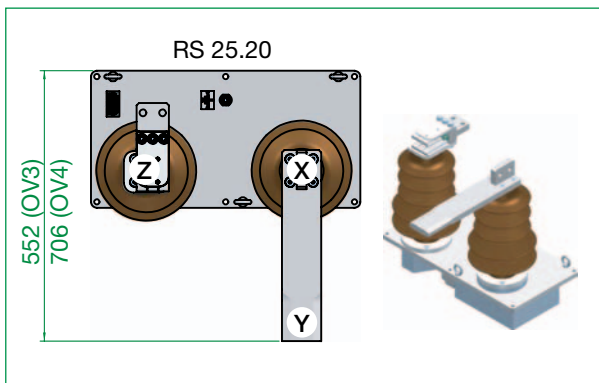
Two integrated interlocked contactors control the moving knife operation.

Options (subject to additional costs)

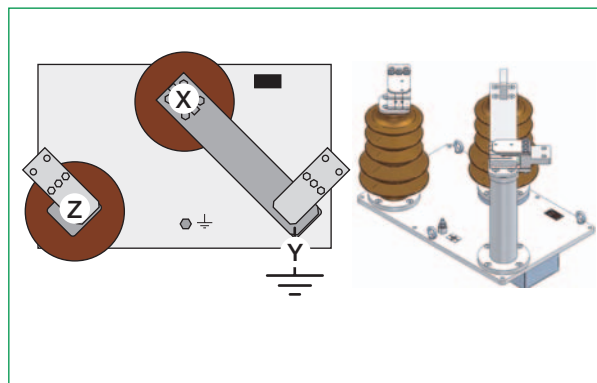
Poles configuration

Alternative

Application D

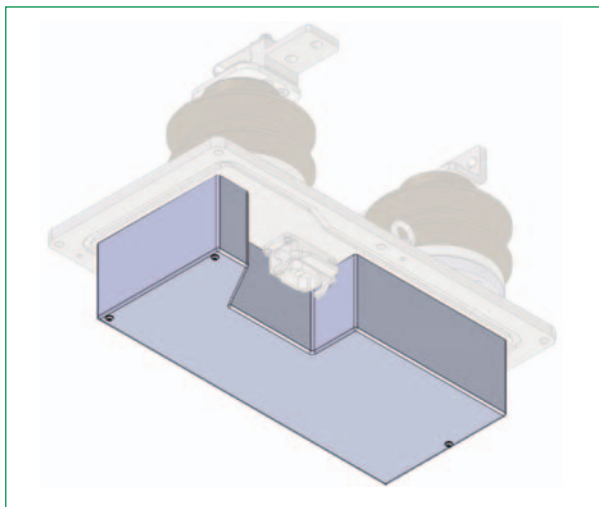


Application E



Protecting cover for LV part

Applicable for electric and electro-pneumatic versions.

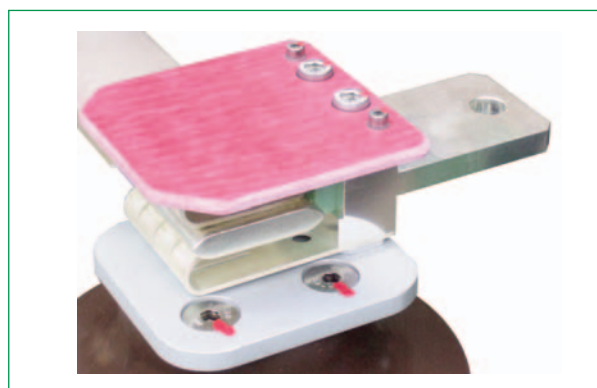


In case of electro-pneumatic operation, the customer's air circuit is connected directly into a G1/4" connection on the base plate. The connection must be ordered separately (refer to page 7 for details).

Roof execution

Special executions to install the complete RS on the roof (without roof opening) are available for the electric version upon request.

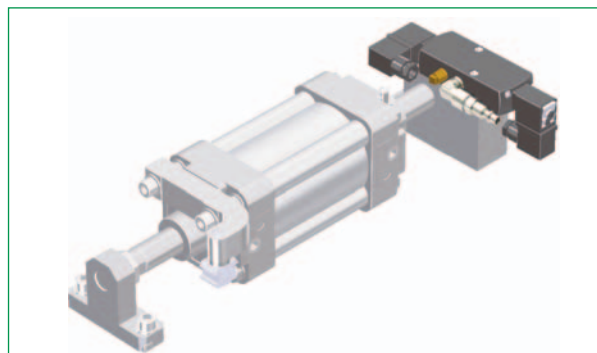
Protection for severe ice conditions (10 mm ice)



Example for RSxx.10

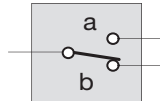
Pneumatic operation

The electro-pneumatic drive fits in the same volume as the electric drive. The customer's air circuit is connected directly into the G1/4" L-connection of the cylinder valve, by means of a quick release air connection (to be ordered separately - refer to page 7).



Definition of the auxiliary switches





Change-over switch
Type: CO



The contact "a" corresponds to a NO (Normally Open) contact.
The contact "b" corresponds to a NC (Normally Close) contact.

Part numbers for separately ordered items

LV mobile connector

Auxiliary switches		Fixed connector type	Mobile connector					
Number	Type		Type	Number of pin		Cable gland	Cable entry	Secheron's number
		Size 2.5 mm ²		Size 1.5 mm ²				
Electric version								
2a + 2b	CO	Harting HAN 24 DD	Harting HAN 24 DD	7	7	M28		SP1850005R00003
4a + 4b	CO	Harting HAN 24 DD	Harting HAN 24 DD	7	13	M28		SP1850005R00004
Electro-pneumatic version								
2a + 2b	CO	Harting HAN 24 DD	Harting HAN 24 DD	0	13	M28		SP1850005R00001
4a + 4b	CO	Harting HAN 24 DD	Harting HAN 24 DD	0	19	M28		SP1850005R00002

The above references are given considering that all the auxiliary contacts are wired, and with an external wire diameter of 3.7 mm (for 2.5mm² section) and 2.9 mm (for 1.5 mm² section). If the conditions are different from these, the above references may change. In such case please inform Sécheron accordingly.

Pneumatic connection

Quick release air connection for the pneumatic operation

Type PARKER PB 52 with pipe 8x1
Sécheron's number: SP1850009R00001

The air connection mobile connector must be ordered separately



Designation code information

- Be sure to establish the designation code from our latest version of the brochure by downloading it from our website "www.secheron.com".
- Be careful to write down the 18 digits for the type designation code when placing your order.
- For technical reasons some options and configurations indicated in the designation code cannot be combined.

Designation code (options are subject to additional costs) - Order form

Line	Description	Designation	Standard	Options	Customer's choice
10	Product type	RS	RS		RS
11	Rated operational voltage	up to 3.6 kVdc up to 27.5 kVac	03 25		
12	Rated conventional free-air thermal current	1000 A 2000 A 3000 A	10 20 30		
13	Application	Change-over switch Disconnecter switch Disconnecter and Earthing switch	C D E		
14	Pole configurations	Standard <i>(only for application D and E) Alternative</i>	S	A	
15	Overvoltage category between poles	(RS25.. and RS03..) OV4 (RS25.. only) OV3	4 3		
16	Operation	Electric <i>Electro-pneumatic</i>	E	P	
17	Control voltage	24 Vdc 36 Vdc 48/50 Vdc 72 Vdc 110 Vdc	A B C D E		
18	Auxiliary contacts ⁽¹⁾	2a+2b - (switch CO) - silver type 2a+2b - (switch CO) - gold type 4a+4b - (switch CO) - silver type 4a+4b - (switch CO) - gold type	1	2 3 4	
19	Low voltage connector	Harting connector type HAN 24 DD	A		A
20	Low voltage protecting cover	No Yes	0	1	
21	Control equipment	(Electro-pneumatic version) Not applicable (Electric version) Integrated	Z 1		
22	Roof execution	Roof opening	S		S
23	Ice protection	No Yes	0	1	
24	Ambient temperature range	(Electric version) -40°C to +70°C <i>(Electric version) extended to -50°C to +70°C</i> <i>(Electro-pneumatic version) -25°C to +70°C</i>	1	2 3	

(1) Refer to page 7 for definition of the auxiliary switches

The low voltage mobile connector and air connection must be ordered separately (refer to page 7).

- Electric version: SP1850005R00003 SP1850005R00004
- Electro-pneumatic version: SP1850005R00001 SP1850005R00002
- Air connection: SP1850009R00001

Example of customer's choice: **RS 25 20 C S 4 E E 3 A 1 1 S 0 1**

Line	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
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The bold characters of the designation code define the device type.

Place and date:	Signature:
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