

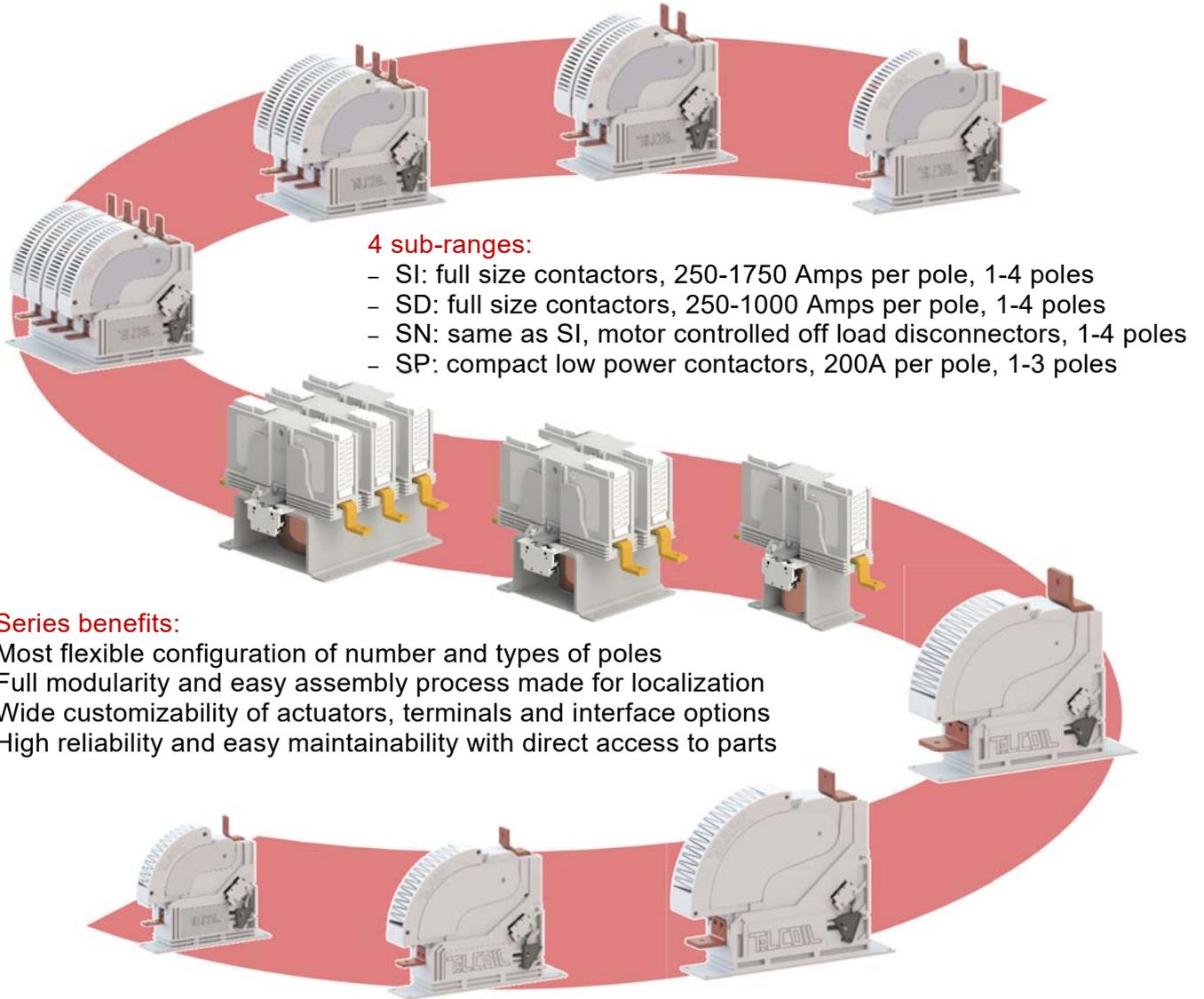


TELAAR

SI-PANORAMA

S-Series Contactors & Disconnectors

S-series contactors and disconnectors are globally the most complete range of devices for AC and DC current switching. Flexibly configurable in thousands of versions, they fit a wide variety of applications and offer highest performances to suit virtually any specification



Designed to Railway Standards but suitable for multiple application



Rolling stock



Substation equipment



Energy generation

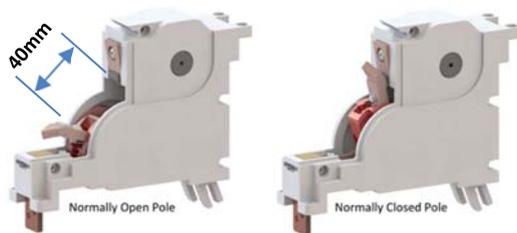
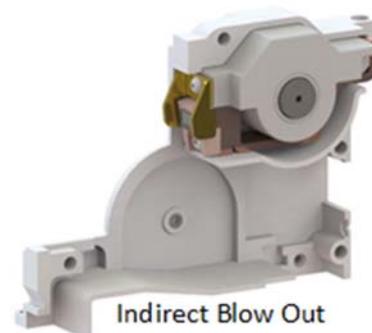


Industrial application

SI General Characteristics

SI is the widest S-series sub-range of contactors, designed to Railway Standards, suitable for both AC and DC current switching application up to 4000Vdc. SI models can be used in multiple applications, from Rolling Stock traction or auxiliary power systems, to Rail Wayside current control, as well as inside Energy Conversion equipment and Industrial Power control applications.

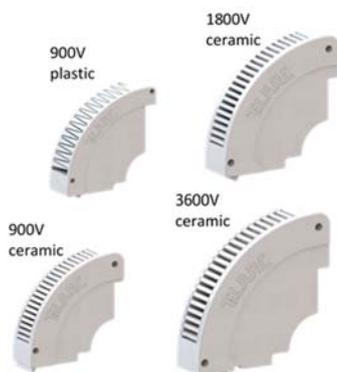
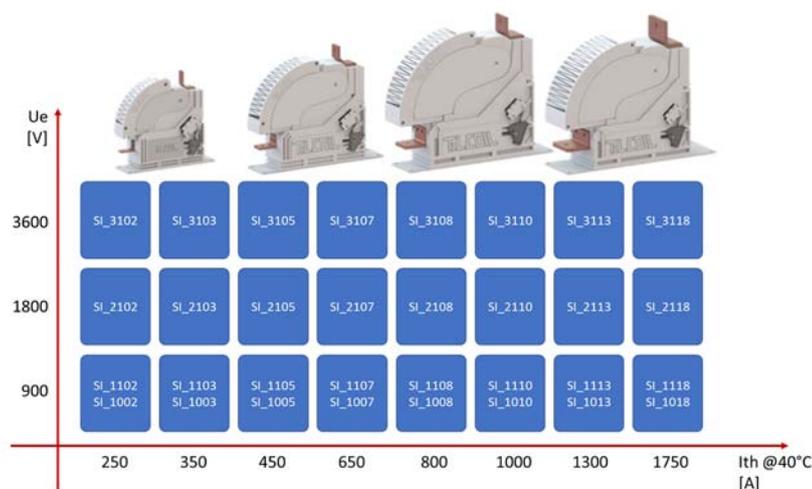
SI arc extinguishing system is based on indirect (non-permanent) blow out coils, fed only during arcing time and ignited by a contactless magnetic arcing contact. This allows a high number of turns in the blow out coil, to obtain, even with a low residual current, a strong blow effect magnetic field, which is extended over the metal plates on both sides of the arc chute. As a consequence, SI contactors are fully bidirectional and have no critical currents.



The main pole contacts open 40mm, fully guaranteeing a 4,8kV insulation. Each pole can be configured as Normally Open or Normally Closed, either version can be fitted in combination with the other, moved by the same actuator. When combined, the switching logic of NO and NC poles is break before make.

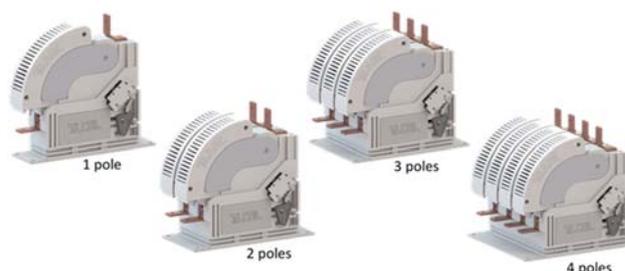
Poles are available in 8 different thermal current levels, differentiated in 4 physical sizes, each offering 2 combinations of busbar thickness.

Each pole can be equipped with 900V, 1800V or 3600V DC capable ceramic arc chutes, a plastic version is available for 900V applications. Compared to plastic, ceramic arc chutes offer a higher maximum breaking performance and longer durability



The side magnetic blow out plates are sized according to the type of arc chute selected, hence belong to the „arc chute kit“, together with the magnetic core crossing the blow out coil. The arc chutes can be removed from and plugged back onto the poles without tools for easy tips inspection and replacement

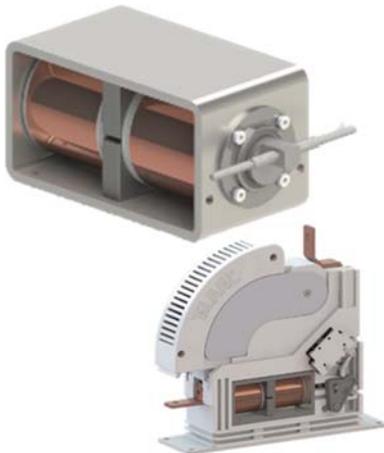
In total there are 64 basic poles versions, that can be assembled as 1-2-3-4 poles units, to obtain 256 basic SI contactors combinations



SI General Characteristics (contd)

The actuator is prepackaged as poles axle moving module fitting the container slot (varying by size and number of poles). For SI contactors, the actuator can be either mono- or bi-stable:

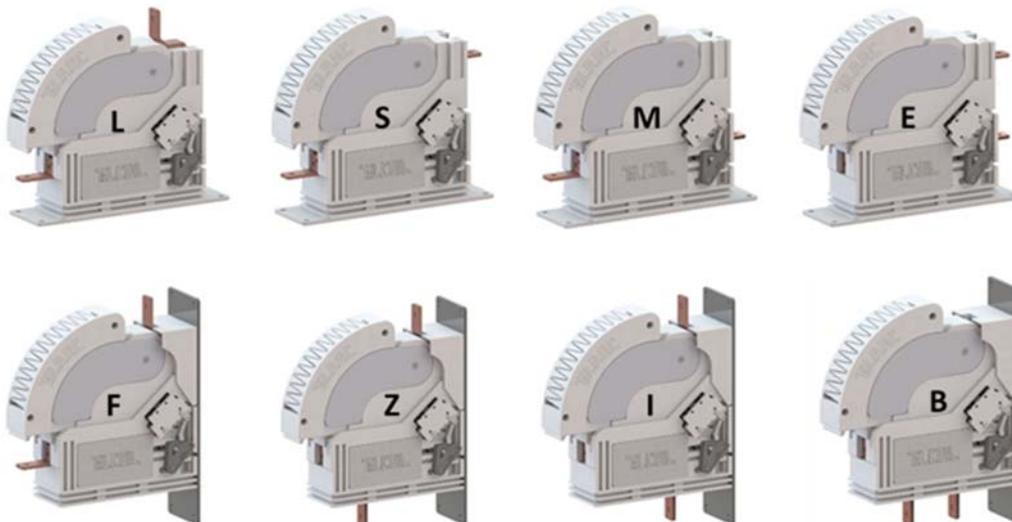
The monostable version (TELCOIL) is composed by 1 or more coils packaged with an electronic analog card that drives the coil(s) with different pick-up and hold-in currents



The bistable version is composed by a double (or quadruple) coil assembly + a latch for the actuation plunger. The pick-up coil is de-energized at the end of its stroke when the latch locks in, thus resulting in a zero watt hold-in, the opening coil is energized to release the latch and open the contactor.



SI contactors poles terminals can be configured in 8 different shapes, allowing vertical plane („wall“) or horizontal plane („floor“) fixing without changing the pole orientation and its dynamic behaviour, i.e. without any setting or hardware difference in the poles. The terminal kits vary by current / shape and run inside container slots.

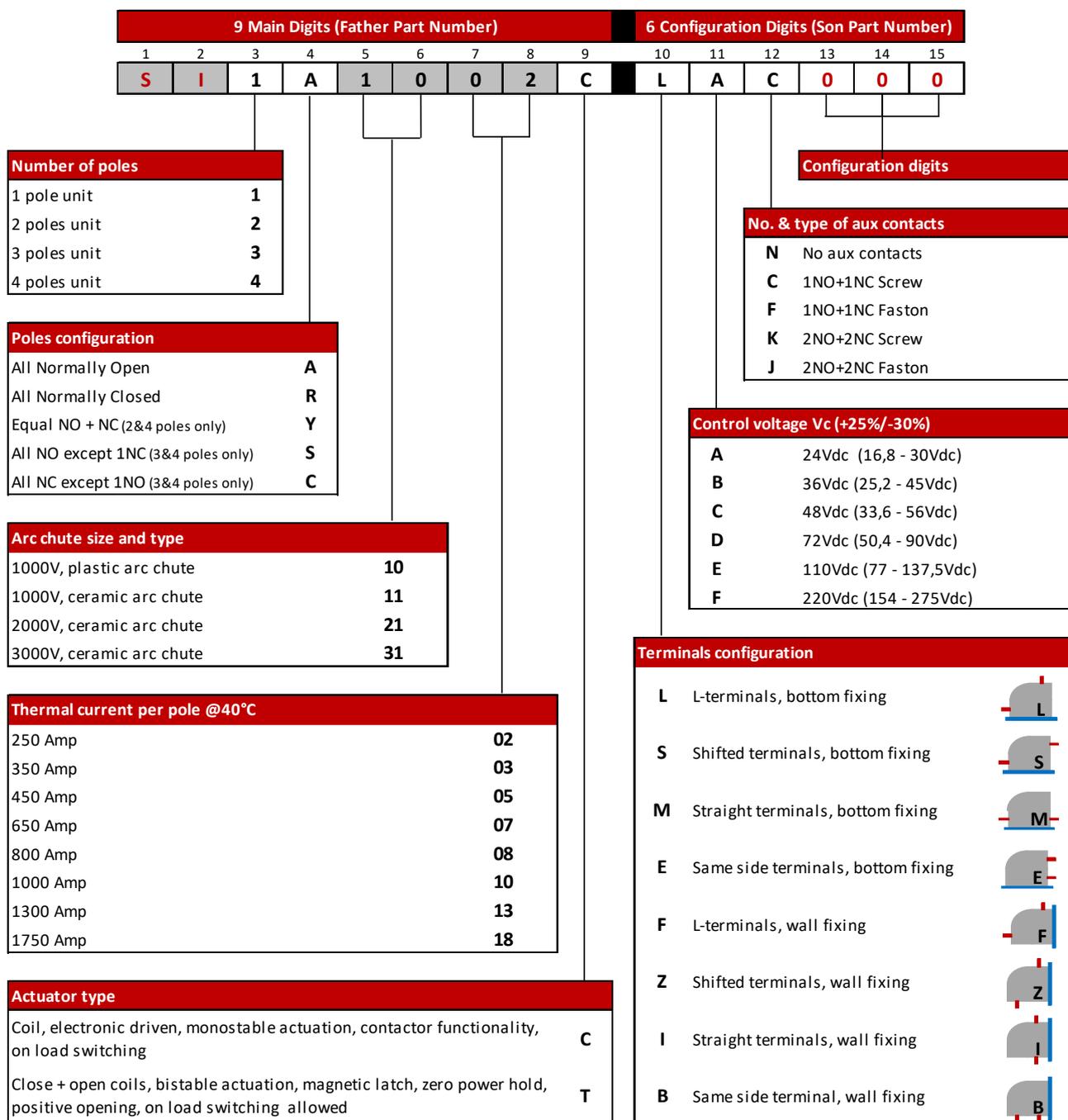


The fixing base can be customized to fit any required installation requirement. Inter-pole connection busbars are available in different shapes and are easily interchangeable on each pole. Poles can be connected in parallel or series. Customized terminal shapes are available on request.

As a standard, all options (current rating, terminal configuration, etc) are to be the same between the different poles, yet customization is possible. The plastic parts composing the container module are riveted together after insertion of the needed terminal bars when required.

SI Part Number Selection

SI contactors have a 15 digits Part Number covering all standard options, for a total of >80000 combinations



- | | | |
|---------------|---|---|
| Main digits | } | 1. number and type of poles (NO/NC – their combination), |
| | | 2. nominal voltage (type of arc-chutes), |
| | | 3. thermal current (size of contactor and of busbars) |
| | | 4. actuator type (monostable / bistable) |
| Config digits | } | 5. Terminal configuration (includes wall/floor fixing information) |
| | | 6. Control voltage (coil) |
| | | 7. Number and terminal type of auxiliary contacts blocks (each 1NO+1NC Crouzet IP67 sealed) |
| | | 8. Standard / special versions (customized arrangements) |

SI Technical Data

ELECTRICAL CHARACTERISTICS OF THE MAIN POLE(S)

1 NO Pole	Rated operational voltage	Rated insulation voltage	Rated impulse withstand voltage	Free air thermal current @40°C	Rated operational current DC	Maximum breaking curr. DC - $t=15ms$	Maximum breaking curr. AC - $\cos\phi=0,8$	Short time withstand current 20ms	Making capacity	Electrical life endurance @Ue/Ie	Critical current rev. Polarization @Ue
	Ue	Ui	Uimp	Ith	Ie	Ibc	Iba	Icw	Im		Icr
	[V]	[V]	[kV]	[A]	[A]	[A]	[A]	[kA]	[kA]	cycles	[A]
SI1A1002	900	4800	25	250	125	500	800	6	6	8000	0
SI1A1102	900	4800	25	250	250	1000	1600	6	6	8000	0
SI1A2102	1800	4800	25	250	175	500	800	6	6	8000	0
SI1A3102	3600	4800	25	250	100	250	400	6	6	8000	0
SI1A1003	900	4800	25	350	175	500	800	6	6	8000	0
SI1A1103	900	4800	25	350	350	1000	1600	6	6	8000	0
SI1A2103	1800	4800	25	350	245	500	800	6	6	8000	0
SI1A3103	3600	4800	25	350	140	250	400	6	6	8000	0
SI1A1005	900	4800	25	450	225	1000	1600	10	10	8000	0
SI1A1105	900	4800	25	450	450	2000	3200	10	10	8000	0
SI1A2105	1800	4800	25	450	315	1000	1600	10	10	8000	0
SI1A3105	3600	4800	25	450	180	500	800	10	10	8000	0
SI1A1007	900	4800	25	650	325	1000	1600	10	10	8000	0
SI1A1107	900	4800	25	650	650	2000	3200	10	10	8000	0
SI1A2107	1800	4800	25	650	455	1000	1600	10	10	8000	0
SI1A3107	3600	4800	25	650	260	500	800	10	10	8000	0
SI1A1008	900	4800	25	800	400	1500	2400	12	12	8000	0
SI1A1108	900	4800	25	800	800	3000	4800	12	12	8000	0
SI1A2108	1800	4800	25	800	560	1500	2400	12	12	8000	0
SI1A3108	3600	4800	25	800	320	750	1200	12	12	8000	0
SI1A1010	900	4800	25	1000	500	1500	2400	12	12	8000	0
SI1A1110	900	4800	25	1000	1000	3000	4800	12	12	8000	0
SI1A2110	1800	4800	25	1000	700	1500	2400	12	12	8000	0
SI1A3110	3600	4800	25	1000	400	750	1200	12	12	8000	0
SI1A1013	900	4800	25	1300	650	1500	2400	12	12	8000	0
SI1A1113	900	4800	25	1300	1300	3000	4800	12	12	8000	0
SI1A2113	1800	4800	25	1300	910	1500	2400	12	12	8000	0
SI1A3113	3600	4800	25	1300	520	750	1200	12	12	8000	0
SI1A1018	900	4800	25	1750	875	1500	2400	12	12	8000	0
SI1A1118	900	4800	25	1750	1750	3000	4800	12	12	8000	0
SI1A2118	1800	4800	25	1750	1225	1500	2400	12	12	8000	0
SI1A3118	3600	4800	25	1750	700	750	1200	12	12	8000	0

SI Technical Data (contd)

ELECTRICAL CHARACTERISTICS OF THE MAIN POLE(S)

2 NO Poles	Free air thermal current @40°C	Rated operational current DC	Maximum breaking curr. DC - $\tau=15\text{ms}$	Maximum breaking curr. AC - $\cos\phi=0,8$	Short time withstand current 20ms	Making capacity
	I _{th}	I _{th}	I _{bc}	I _{ba}	I _{cw}	I _m
	[A]	[A]	[A]	[A]	[kA]	[kA]
poles connection	parallel	series	series	series	parallel	parallel
SI2A1002	450	225	750	1200	9	7
SI2A1102	450	450	1500	2400	9	7
SI2A2102	450	315	750	1200	9	7
SI2A3102	450	180	375	600	9	7
SI2A1003	630	315	750	1200	9	7
SI2A1103	630	630	1500	2400	9	7
SI2A2103	630	441	750	1200	9	7
SI2A3103	630	252	375	600	9	7
SI2A1005	810	405	1500	2400	15	12
SI2A1105	810	810	3000	4800	15	12
SI2A2105	810	567	1500	2400	15	12
SI2A3105	810	324	750	1200	15	12
SI2A1007	1170	585	1500	2400	15	12
SI2A1107	1170	1170	3000	4800	15	12
SI2A2107	1170	819	1500	2400	15	12
SI2A3107	1170	468	750	1200	15	12
SI2A1008	1440	720	2250	3600	18	14
SI2A1108	1440	1440	4500	7200	18	14
SI2A2108	1440	1008	2250	3600	18	14
SI2A3108	1440	576	1125	1800	18	14
SI2A1010	1800	900	2250	3600	18	14
SI2A1110	1800	1800	4500	7200	18	14
SI2A2110	1800	1260	2250	3600	18	14
SI2A3110	1800	720	1125	1800	18	14
SI2A1013	2340	1170	2250	3600	18	14
SI2A1113	2340	2340	4500	7200	18	14
SI2A2113	2340	1638	2250	3600	18	14
SI2A3113	2340	936	1125	1800	18	14
SI2A1018	3150	1575	2250	3600	18	14
SI2A1118	3150	3150	4500	7200	18	14
SI2A2118	3150	2205	2250	3600	18	14
SI2A3118	3150	1260	1125	1800	18	14

3 NO Poles	Free air thermal current @40°C	Short time withstand current 20ms	Making capacity
	I _{th}	I _{cw}	I _m
	[A]	[kA]	[kA]
poles connection	parallel	parallel	parallel
SI3A_02	600	12	10
SI3A_03	900	12	10
SI3A_05	1200	20	16
SI3A_07	1800	20	16
SI3A_08	2100	24	20
SI3A_10	2700	24	20
SI3A_13	3500	24	20
SI3A_18	4500	24	20

4 NO Poles	Free air thermal current @40°C	Short time withstand current 20ms	Making capacity
	I _{th}	I _{cw}	I _m
	[A]	[kA]	[kA]
poles connection	parallel	parallel	parallel
SI4A_02	750	15	12
SI4A_03	1200	15	12
SI4A_05	1500	25	20
SI4A_07	2100	25	20
SI4A_08	2600	30	24
SI4A_10	3200	30	24
SI4A_13	4100	30	24
SI4A_18	5500	30	24

SI Technical Data (contd)

ELECTRICAL CHARACTERISTICS OF THE MAIN POLE(S)

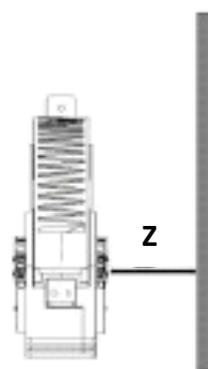
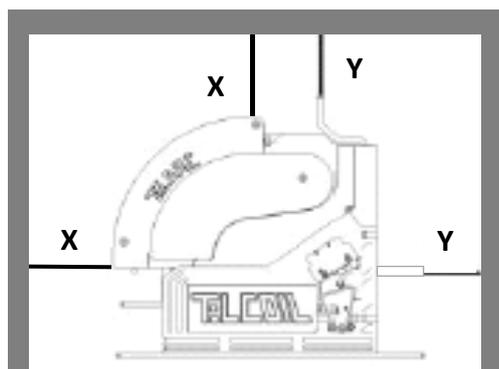
1 NC Pole	Rated operational voltage	Rated insulation voltage	Rated impulse withstand voltage	Free air thermal current @40°C	Rated operational current DC	Maximum breaking curr. DC - $t=15\text{ms}$	Maximum breaking curr. AC - $\cos\phi=0,8$	Short time withstand current 20ms	Making capacity	Electrical life endurance @ U_e/I_e	Critical current rev. Polarization @ U_e
	U_e	U_i	U_{imp}	I_{th}	I_e	I_{bc}	I_{ba}	I_{cw}	I_m		I_{cr}
	[V]	[V]	[kV]	[A]	[A]	[A]	[A]	[kA]	[kA]	cycles	[A]
SI1R1002	900	4800	25	250	60	200	320	6	6	8000	0
SI1R1102	900	4800	25	250	130	400	640	6	6	8000	0
SI1R2102	1800	4800	25	250	90	200	320	6	6	8000	0
SI1R3102	3600	4800	25	250	50	100	160	6	6	8000	0
SI1R1003	900	4800	25	350	90	200	320	6	6	8000	0
SI1R1103	900	4800	25	350	180	400	640	6	6	8000	0
SI1R2103	1800	4800	25	350	120	200	320	6	6	8000	0
SI1R3103	3600	4800	25	350	70	100	160	6	6	8000	0
SI1R1005	900	4800	25	450	110	400	640	10	10	8000	0
SI1R1105	900	4800	25	450	230	800	1280	10	10	8000	0
SI1R2105	1800	4800	25	450	160	400	640	10	10	8000	0
SI1R3105	3600	4800	25	450	90	200	320	10	10	8000	0
SI1R1007	900	4800	25	650	160	400	640	10	10	8000	0
SI1R1107	900	4800	25	650	330	800	1280	10	10	8000	0
SI1R2107	1800	4800	25	650	230	400	640	10	10	8000	0
SI1R3107	3600	4800	25	650	130	200	320	10	10	8000	0
SI1R1008	900	4800	25	800	200	600	960	12	12	8000	0
SI1R1108	900	4800	25	800	400	1200	1920	12	12	8000	0
SI1R2108	1800	4800	25	800	280	600	960	12	12	8000	0
SI1R3108	3600	4800	25	800	160	300	480	12	12	8000	0
SI1R1010	900	4800	25	1000	250	600	960	12	12	8000	0
SI1R1110	900	4800	25	1000	500	1200	1920	12	12	8000	0
SI1R2110	1800	4800	25	1000	350	600	960	12	12	8000	0
SI1R3110	3600	4800	25	1000	200	300	480	12	12	8000	0
SI1R1013	900	4800	25	1300	330	600	960	12	12	8000	0
SI1R1113	900	4800	25	1300	650	1200	1920	12	12	8000	0
SI1R2113	1800	4800	25	1300	460	600	960	12	12	8000	0
SI1R3113	3600	4800	25	1300	260	300	480	12	12	8000	0
SI1R1018	900	4800	25	1750	440	600	960	12	12	8000	0
SI1R1118	900	4800	25	1750	880	1200	1920	12	12	8000	0
SI1R2118	1800	4800	25	1750	610	600	960	12	12	8000	0
SI1R3118	3600	4800	25	1750	350	300	480	12	12	8000	0

SI Technical Data (contd)

ACTUATORS / ENVIRONMENTAL / MECHANICAL DATA & STANDARD REF

		S11...02/03	S12...02/03	S13...02/03	S14...02/03	S11...05/07	S12...05/07	S13...05/07	S14...05/07	S11...08/10	S12...08/10	S13...08/10	S14...08/10	S11...13/18	S12...13/18	S13...13/18	S14...13/18	
Monostable Coil	Coil voltage range C-type	Vc	[Vdc] 24/36/48/72/110/220 Vdc +25%/-30%															
	Closing power	Pc	45	90	135	180	60	120	180	240	90	180	270	360	120	240	360	480
	Holding power	Ph	5	10	15	20	10	20	30	40	15	30	45	60	20	40	60	80
	Closing-holding delay	CHR	600				600				600				600			
	Maximum cycling frequency	Cf	12				10				8				6			
Bistable coil (latch)	Coil voltage range T-type	Vc	[Vdc] 24/36/48/72/110/220 Vdc +25%/-30%															
	Closing power	Pc	60	120	180	240	80	160	240	320	120	240	360	480	150	300	450	600
	Holding power	Ph	0															
	Opening power	Po	60	120	180	240	80	160	240	320	120	240	360	480	150	300	450	600
Closing time	Tc	80				100				120				150				
Opening time	To	40				40				40				40				
Overvoltage category EN 50124-1		PD3/OV3																
Component cat / Operation frequency		A2/C3																
Shock & vibration		EN 61373 cat.1B																
Mechanical life	[cycles]	2mio cycles																
Operational temperature (IEC 50125-1)	[°C]	-40°C +70°C																
Storage temperature	[°C]	-50°C +85°C																
Operational altitude	[m asl]	<2000 m asl																
Hi Pot test main poles to ground & grounded aux [50Hz 1min]	[V]	11600																
Hi Pot test between open poles [50Hz, 1min]	[V]	9200																
Hi Pot test coil and aux to ground [50Hz, 1min]	[V]	1500																
Weight range(depends on arc chute/terminals)	[kg]	2,7	5,6	8,5	11	6,3	10	16	20	11	17	26	29					

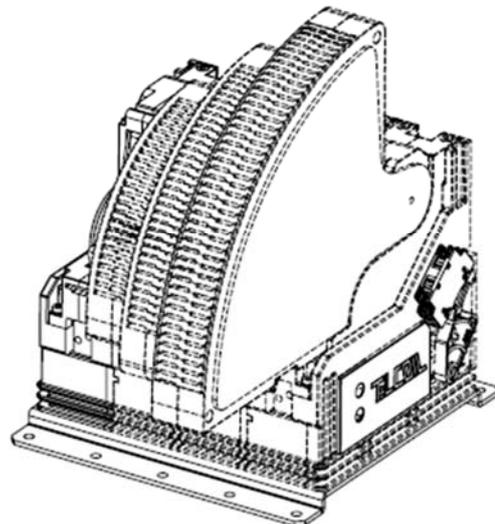
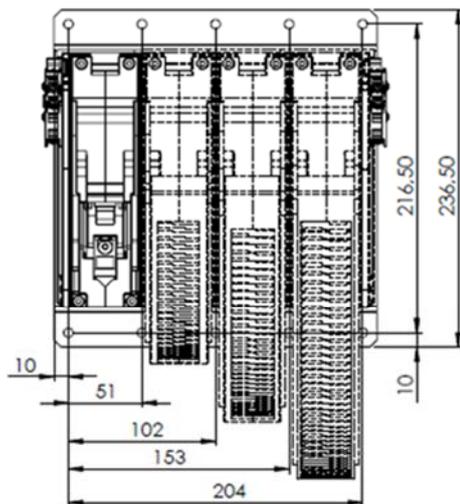
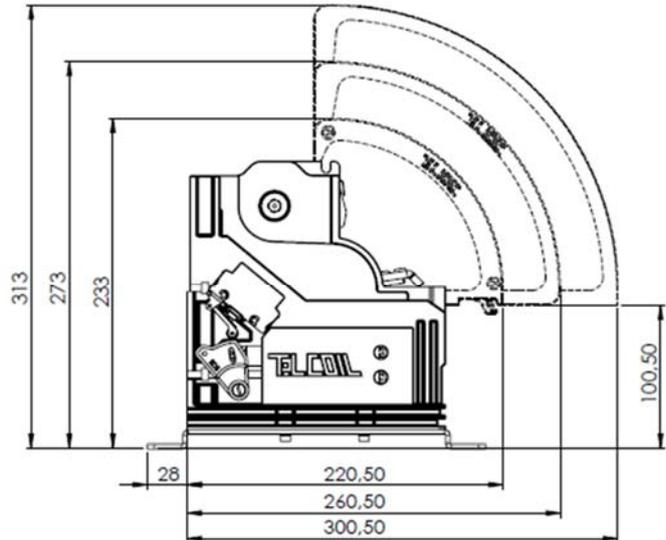
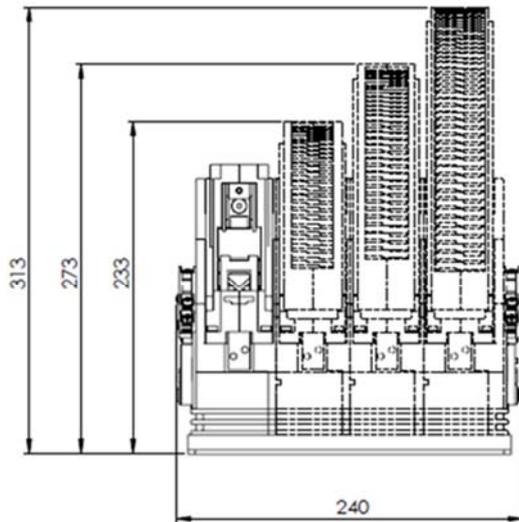
INSTALLATION INSULATING DISTANCES



mm		Nominal voltage (Arc chute)			
		10	11	21	31
Distance to metal parts	X	100	100	120	150
	Y	50	50	50	50
	Z	30	30	50	50
Distance to insulated parts	X	50	50	50	60
	Y	30	30	30	50
	Z	20	20	20	30

SI 02/03 Sizes

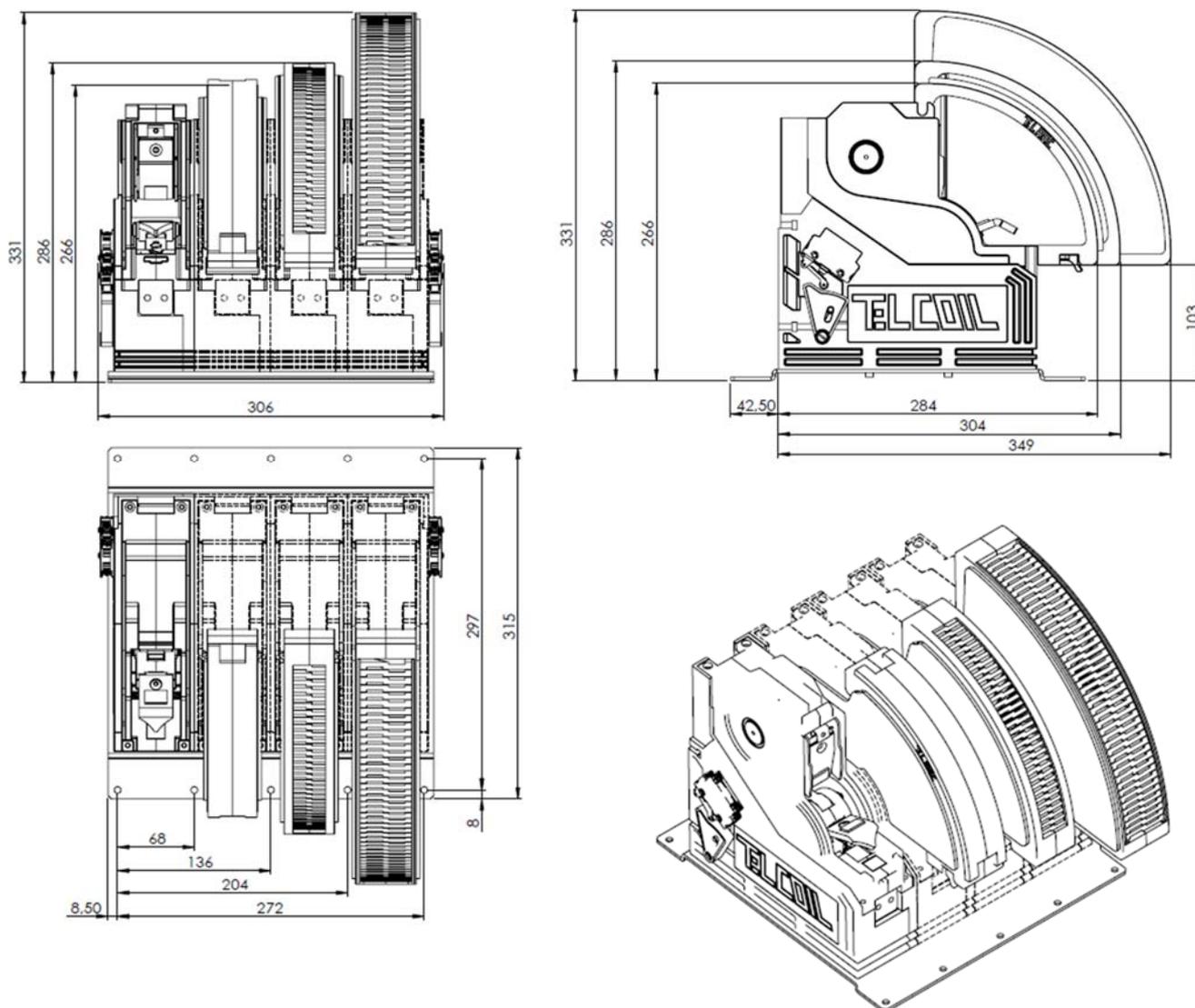
Sizes are given for 3 types of arc chutes: 900V/1800V/3600V



Width size [mm]	1pole	2 poles	3 poles	4 poles
Contacteur body (no aux)	67	118	169	220
Overall (2 aux contacts blocks)	88	139	190	241

SI 05/07 Sizes

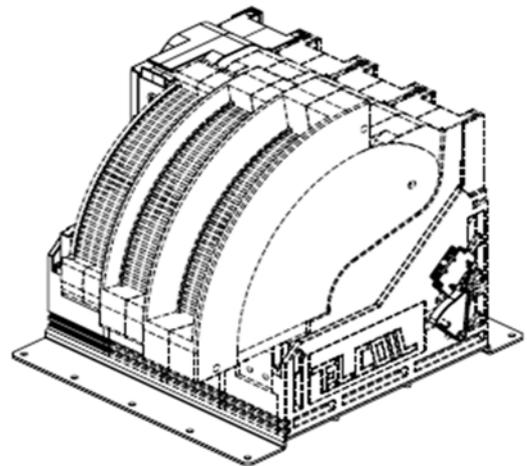
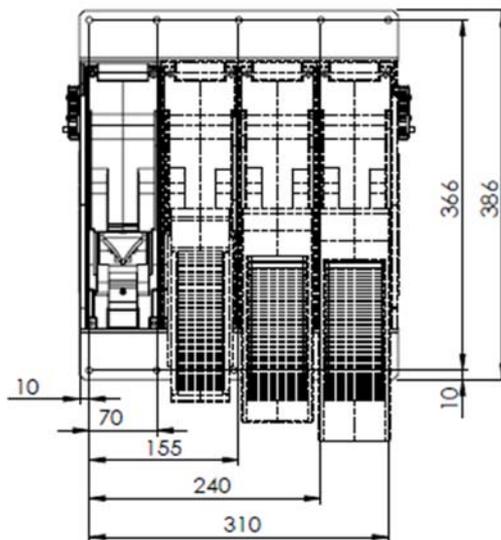
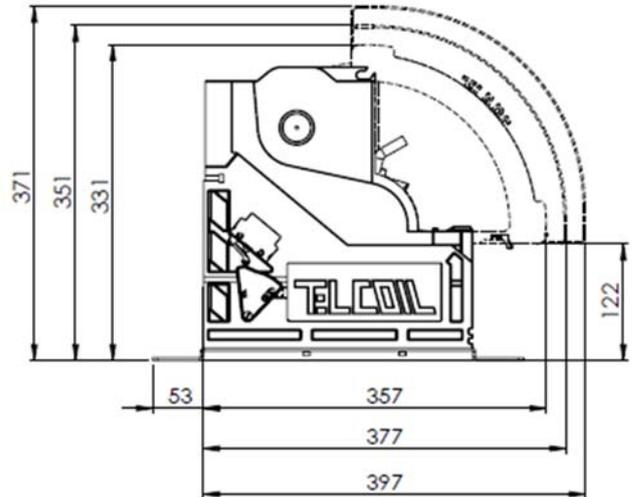
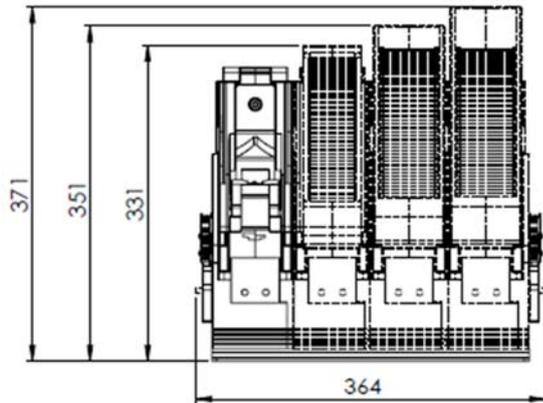
Sizes are given for 3 types of arc chutes: 900V/1800V/3600V



Width size [mm]	1pole	2 poles	3 poles	4 poles
Contacteur body (no aux)	75	143	211	279
Overall (2 aux contacts blocks)	102	170	238	306

SI 08/10 Sizes (preliminary)

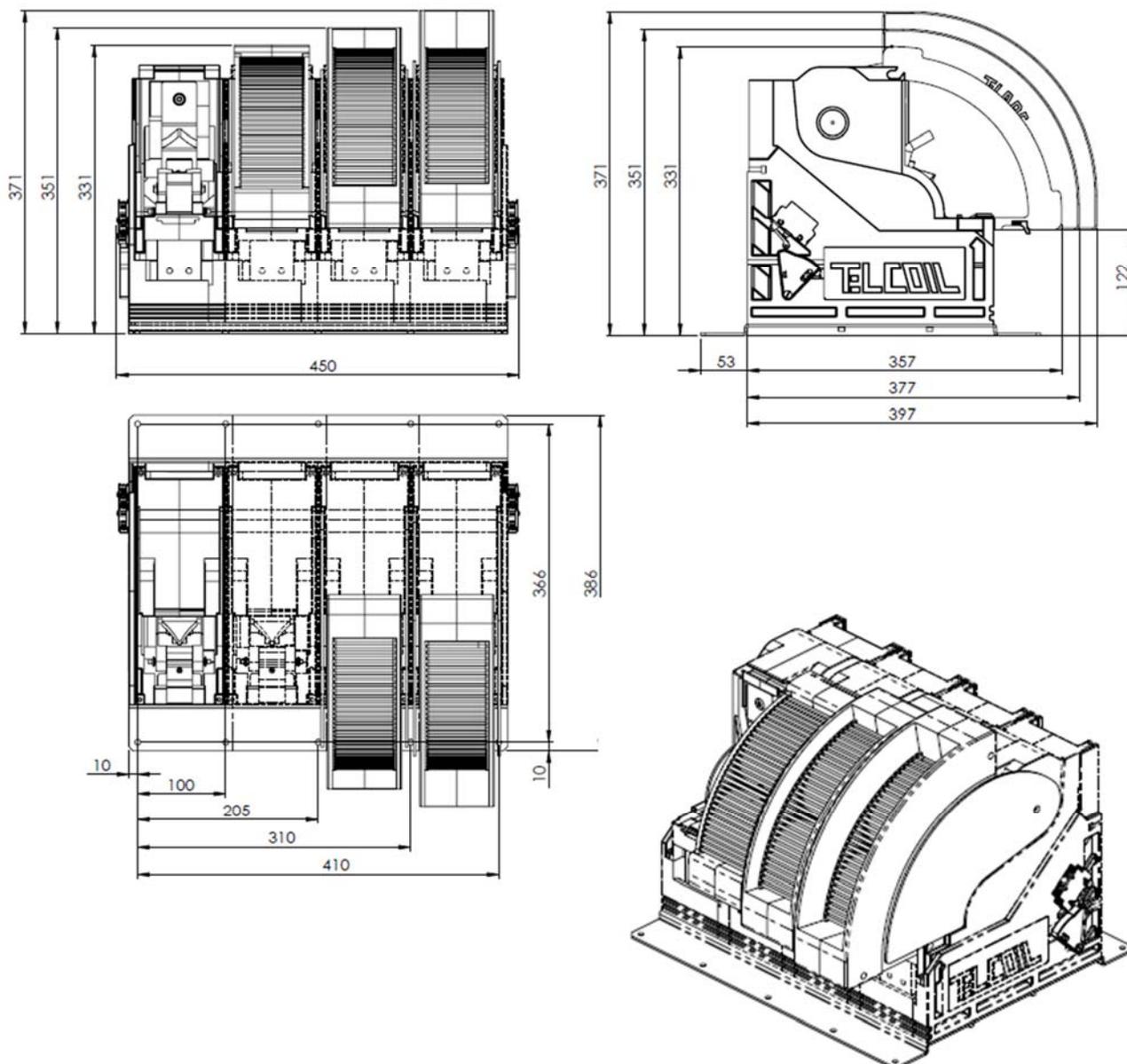
Sizes are given for 3 types of arc chutes: 900V/1800V/3600V



Width size [mm]	1pole	2 poles	3 poles	4 poles
Contacteur body (no aux)	90	170	250	330
Overall (2 aux contacts blocks)	118	198	278	358

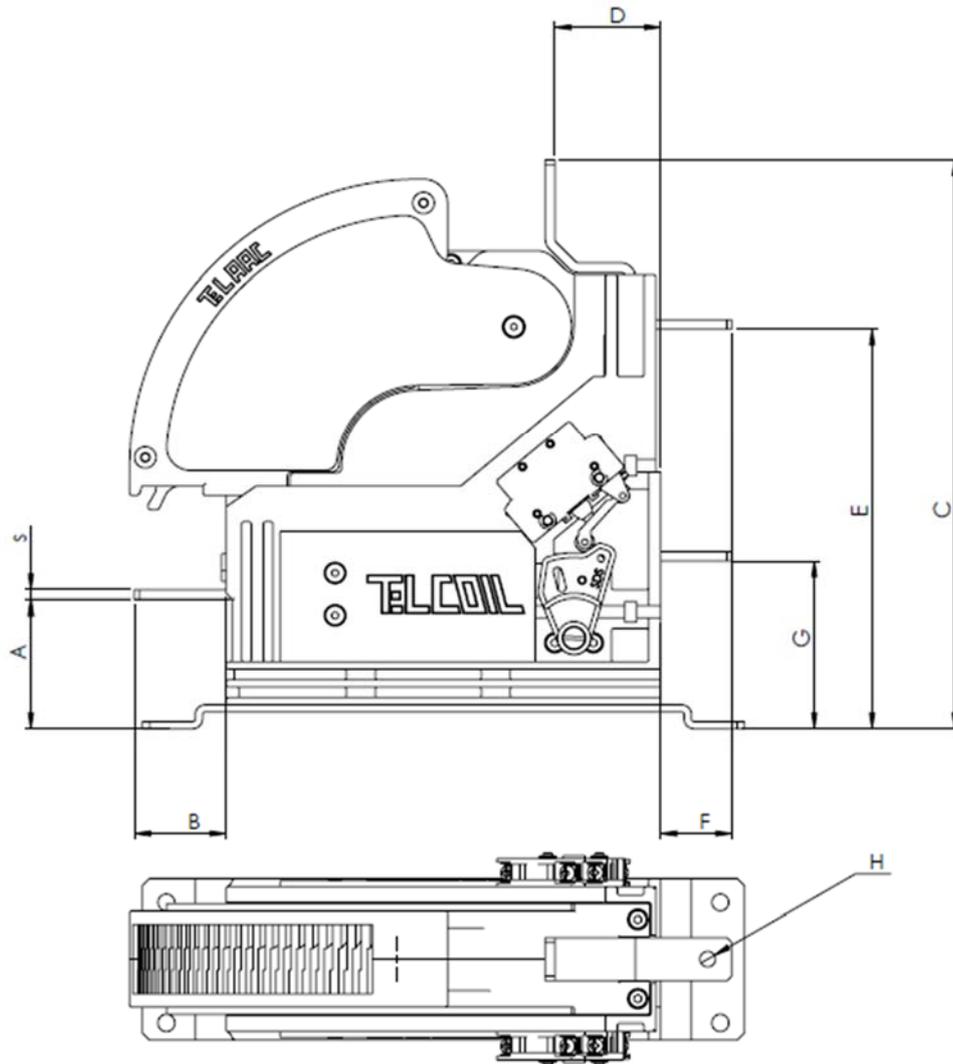
SI 13/18 Sizes (preliminary)

Sizes are given for 3 types of arc chutes: 900V/1800V/3600V



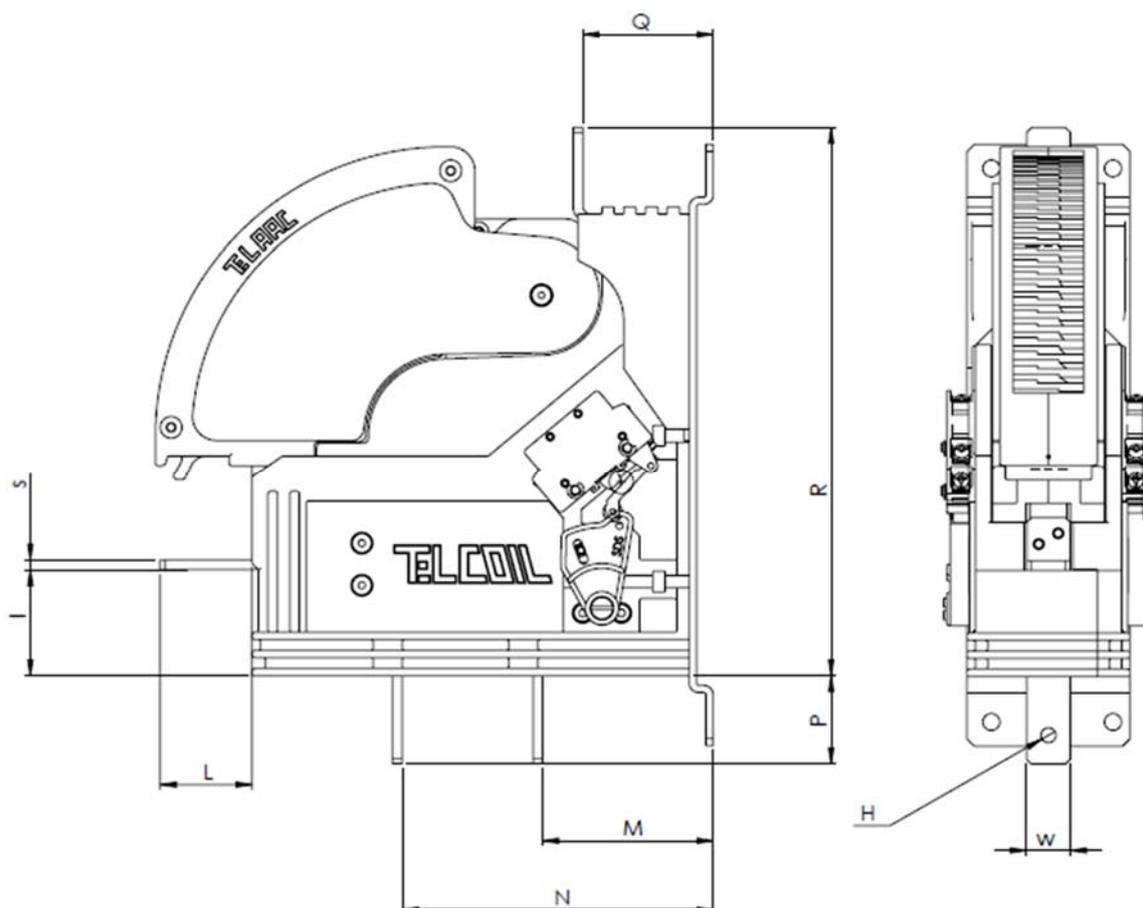
Width size [mm]	1pole	2 poles	3 poles	4 poles
Contacteur body (no aux)	120	230	340	450
Overall (2 aux contacts blocks)	148	258	368	478

SI terminals sizes Floor Mounting



Horizontal ("Floor") Mounting - Sizes in mm												
Rating	A	B	C	D	E	F	G	s	w	H	dist between poles holes	gap between poles terminals
02	54	38	238	44	167,5	30	70	3	18	6,5	51	33
03	54	38	238	44	167,5	30	70	4	18	6,5	51	33
05	60,5	52	287,5	56	201,5	45	79	5	30	8,5	68	38
07	60,5	52	287,5	56	201,5	45	79	6	30	8,5	68	38
08	60	55	345	59	241	55	74	8	50	11	80	30
10	60	55	345	59	241	55	74	10	50	11	80	30
13	60	55	345	59	241	55	74	8	80	13	110	30
18	60	55	345	59	241	55	74	10	80	13	110	30

SI terminals sizes Wall Mounting



Vertical ("Wall") Mounting - Sizes in mm

Rating	I	L	M	N	P	Q	R	s	w	H	dist between poles holes	gap between poles terminals
02	44	38	70,5	128,5	36,5	54	228	3	18	6,5	51	33
03	44	38	70,5	128,5	36,5	54	228	4	18	6,5	51	33
05	50,5	52	72,5	173,5	51	66	282,5	5	30	8,5	68	38
07	50,5	52	72,5	173,5	51	66	282,5	6	30	8,5	68	38
08	48	55	97	195	55	69	335	8	50	11	80	30
10	48	55	97	195	55	69	335	10	50	11	80	30
13	48	55	97	195	55	69	335	8	80	13	110	30
18	48	55	97	195	55	69	335	10	80	13	110	30

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