Medium voltage products

ABB S.p.A.
Electrification business
Technical Specification - UniSec

Project: Technical specification for UniSec Switchgear
Customer:
Issuer:

Your ref.:
Our ref.:

Table of Contents

1 Product Order Code

Order code from eConfigure shall be read according to below legenda

US_XXXXVVAAYYYY

XXXX (from2 to 7 characters)
Represent the Switchgear configuration, possible values are:
DeF, DF, CCF, CCFF, CCC, CCCF, CCCC, DeV, DV, CCV, CCCV, CCVV, CCBRmFF, CCBRmFV, VVBRmFF, VVBRmFV

Corresponding UniSec panels name are:

D	RLC	Cable Riser
F	SFC	Switch disconnector with Fuse
De	DRC	Direct incoming with Earthing Switch
C	SDC	Switch disconnector
V	HBC	Vacuum Circuit Breaker - Feeder
B	HBS	Vacuum Circuit Breaker - Bus Tie
Rm	DRS	Riser with Measure

VV
Represent the Rated Voltage, possible values are:
12 (if 12kV), 17 (if 17,5kV), 24 (if 24kV)

AA
Represent the Short Circuit and Internal Arc Current, possible values are:
16 (if 16kA), 20 (if 20kA), 21 (if 21kA)

YYYY (2 or 4 characters are used)
Represent the Internal Arc Current relief type, possible values are:
AF (if IAC AF), AFLR (if IAC AFLR with Filters)

1.1 Additional Mandatory Codes

Order code from eConfigure shall be read according to below legenda (1 of those codes must be)

Switchgear auxiliary voltage

CODE	DESCRIPTION
US_Aux230VAC	Switchgear auxiliary voltage 230V AC (Default)
US_Aux110VAC	Switchgear auxiliary voltage 110V AC
US_Aux24VDC	Switchgear auxiliary voltage 24V DC
US_Aux48VDC	Switchgear auxiliary voltage 48V DC
US_Aux60VDC	Switchgear auxiliary voltage 60V DC
US_Aux110VDC	Switchgear auxiliary voltage 110V DC
US_Aux220VDC	Switchgear auxiliary voltage 220V DC

1.2 Optional Codes

Order code from eConfigure shall be read according to below legenda

Apparatus motor

CODE	DESCRIPTION
US_M_C2	Motorized Switch Disconnector (All C panels - qty 2)
US_M_C3	Motorized Switch Disconnector (All C panels - qty 3)
US_M_C4	Motorized Switch Disconnector (All C panels - qty 4)
US_M_F1	Motorized Fused Switch Disconnector (All F panels - qty 1)
US_M_F2	Motorized Fused Switch Disconnector (All F panels - qty 2)
US_M_V1	Motorized Circuit Breaker (All V and B panels - qty 1)
US_M_V2	Motorized Circuit Breaker (All V and B panels - qty 2)
US_M_V3	Motorized Circuit Breaker (All V and B panels - qty 3)
US_M_V4	Motorized Circuit Breaker (All V and B panels - qty 4)

Short circuit indicator

CODE	DESCRIPTION
US_SCI_C2	Short Circuit indicator (All C panels - qty 2)
US_SCI_C3	Short Circuit indicator (All C panels - qty 3)
US_SCI_C4	Short Circuit indicator (All C panels - qty 4)

Heaters

CODE	DESCRIPTION
US_H_1	230VAC Heaters (All panels - qty 1)
US_H_2	230VAC Heaters (All panels - qty 2)
US_H_3	230VAC Heaters (All panels - qty 3)
US_H_4	230VAC Heaters (All panels - qty 4)
US_H_6	230VAC Heaters (All panels - qty 6)

Base frame

CODE	DESCRIPTION
US_Frame_XX	Switchgear base frame (height 300mm)

Packing (extra from domestic to overland cage)

CODE	DESCRIPTION
US_Cage_XX	Option for switchgear overland cage packing

MV Fuses

CODE	DESCRIPTION
US_Fux6-12V6A442	Set of 3 power transformer protection fuses 6-12kV, 6.3A, 442mm
US_Fux10-24V6A442	Set of 3 power transformer protection fuses 10-24kV, 6.3A, 442mm
US_Fux10-24V16A442	Set of 3 power transformer protection fuses 10-24kV, 16A, 442mm
US_Fux10-24V25A442	Set of 3 power transformer protection fuses 10-24kV, 25A, 442mm
US_Fux10-24V31A442	Set of 3 power transformer protection fuses 10-24kV, 31.5A, 442mm
US_Fux10-24V40A442	Set of 3 power transformer protection fuses 10-24kV, 40A, 442mm
US_Fux10-24V50A442	Set of 3 power transformer protection fuses 10-24kV, 50A, 442mm
US_Fux10-24V63A442	Set of 3 power transformer protection fuses 10-24kV, 63A, 442mm
US_Fux10-24V80A442	Set of 3 power transformer protection fuses 10-24kV, 80A, 442mm
US_Fux6-12V100A442	Set of 3 power transformer protection fuses 6-12kV, 100A, 442mm
US_Fux6-12V125A442	Set of 3 power transformer protection fuses 6-12kV, 125A, 442mm
US_Fux6-12V160A442	Set of 3 power transformer protection fuses 6-12kV, 160A, 442mm

2 Switchgear General Data

• Type:	Complete switchgear	
• Application:	Standard IEC 62271-200	
• Degree of protection:	IP3X	
• Internal Arc Classification (IAC):	AF or AFLR with Filters	*(product order code chapt. 1)*

ATTENTION: IAC A-F version - No access to rear and sides of the Swg while is in service. Installation distances to be respected.

• Type of apparatus:	Switch disconnector type SF6 Circuit breaker type Vacuum	
• Packing:	Domestic/ Overland cage	*(optional code chapt. 1.2)*
• FAT Factory acceptance test:	Internal Routine Test (no FAT)	
• Ambient temperature (Mim/Max):	-5°C /40°C	
• Storage temperature:	-5°C	
• Altitude:	≤1000 m	

2.1 Electrical Data

• Rated voltage:	12-17,5-24kV	*(product order code chapt. 1)*
• Service voltage:	10-15-20kV	*(product order code chapt. 1)*
• Power frequency withstand voltage:	28-38-50kV	*(product order code chapt. 1)*
• BIL:	75-95-125kV	*(product order code chapt. 1)*
• Rated frequency:	50Hz	
• Rated busbar current:	630A	
• Rated short circuit current:	16-20-21kA	*(product order code chapt. 1)*
• Rated short circuit current duration:	1s	
• Peak current:	40-50-52,5kA	*(product order code chapt. 1)*
• Arc test current 1s (According to IEC 62271-200):	16-20-21kA	*(product order code chapt. 1)*

2.2 Additional Data

• Internal lighting	No
• Anti Condensation heater of self-regulating type	No/Yes *(optional code chapt. 1.2)*
• Voltage presence indicating system	Fixed lamps, type VPIS
• Type of key locks interlocking (if selected in functional units)	Giussani
• Address labels on functional units	Yes
• Mimic diagrams	Yes
• Routine test reports	Yes
• Our ABB standard drawing template	Yes
• Switchgear colour	RAL 7035
• Busbars treatment	No
• Switchgear base frame (height 300mm)	No/ Yes *(optional code chapt. 1.2)*

2.3 Auxiliary supply and wiring data

• Local control voltage:	230-110VAC; 24,48,60,110,120VDC *(additional mandatory code chapt. 1.1)*
• Control circuits cross section	1 mm^2
• Voltage circuits cross section	1.5 mm^2
• Current circuits cross section	2.5 mm^2
• Earthing circuits cross section	2.5 mm^2
• Interconnection circuits cross section	2.5 mm^2
• Auxiliary Supply circuits cross section	4 mm^2
• Wiring cable type	Standard, PVC
• Wiring cable rated voltage	ABB standard
• Wiring cable colors	STANDARD
• Color of Auxiliary AC	Black
• Color of Auxiliary DC	Black
• Color of CT circuits	Black
• Color of VT circuits	Black
• Color of Earthing circuits	Yellow/Green

2.4 Control and Communication

- Protocol: IEC 61850 + MODBUS
- Communication module type: Ethernet + RS485

2.5 Switchgear Accessories

1	Operating handle for switch disconnector
1	Lifting hooks
1	Left end cover painted
1	Right end cover painted

3 Switchgear Composition:

3.1 DeF (DRC,SFC)

Description	Qty	*Overall dimensions and weights (*)* Weight (Kg)	Width (mm)	Depth (mm)	Height(mm)
DRC (630 A) *H01*	**1**	195	500	1070	1700
SFC (160 A) *H02*	**1**	291	375	1070	1700
Sidewalls			54		
	2	***486***	***929***	***1070***	***1700***

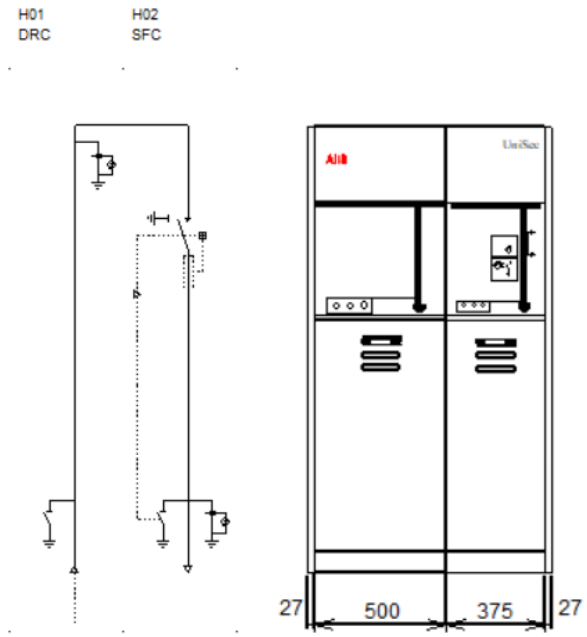
If Internal Arc with Filter **16kA AFLR**

- Depth is **1210mm**
- Weight to be considered is **+36kg** per Swg

If Internal Arc with Filter **20**, **21kA AFLR**:

- Depth is **1210mm**
- Height is **2000mm**
- Weight to be considered is **+54kg** per Swg

If **base frame** option is selected Height shall be increased of **+300mm**



3.2 DF (RLC,SFC)

Description	Qty	*Overall dimensions and weights (*)* Weight (Kg)	Width (mm)	Depth (mm)	Height(mm)
SFC (160 A) *H01*	**1**	371	375	1070	1700
Sidewalls (including **RLC**)			217		
	1	***371***	***592***	***1070***	***1700***

If Internal Arc with Filter **16kA AFLR**

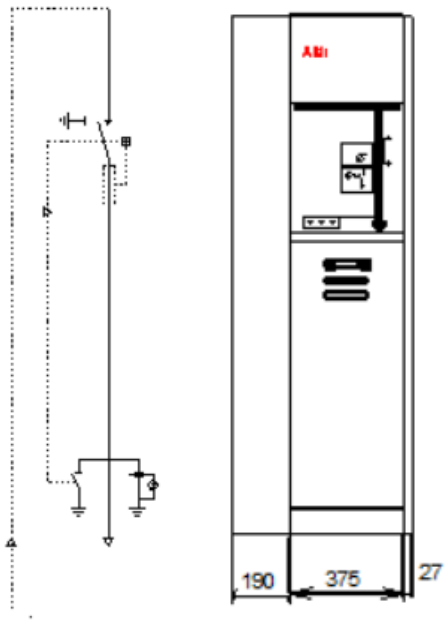
- Depth is **1210mm**
- Weight to be considered is **+18kg** per Swg

If Internal Arc with Filter **20**, **21kA AFLR**:

- Depth is **1210mm**
- Height is **2000mm**
- Weight to be considered is **+27kg** per Swg

If **base frame** option is selected Height shall be increased of **+300mm**

H01
SFC



3.3 CCF (SDC,SDC,SFC)

Description	Qty	*Overall dimensions and weights (*)* Weight (Kg)	Width (mm)	Depth (mm)	Height(mm)
SDC (630 A) *H01, H02*	**2**	286	375	1070	1700
SFC (160 A) *H03*	**1**	291	375	1070	1700
Sidewalls			54		
	3	***813***	***1179***	***1070***	***1700***

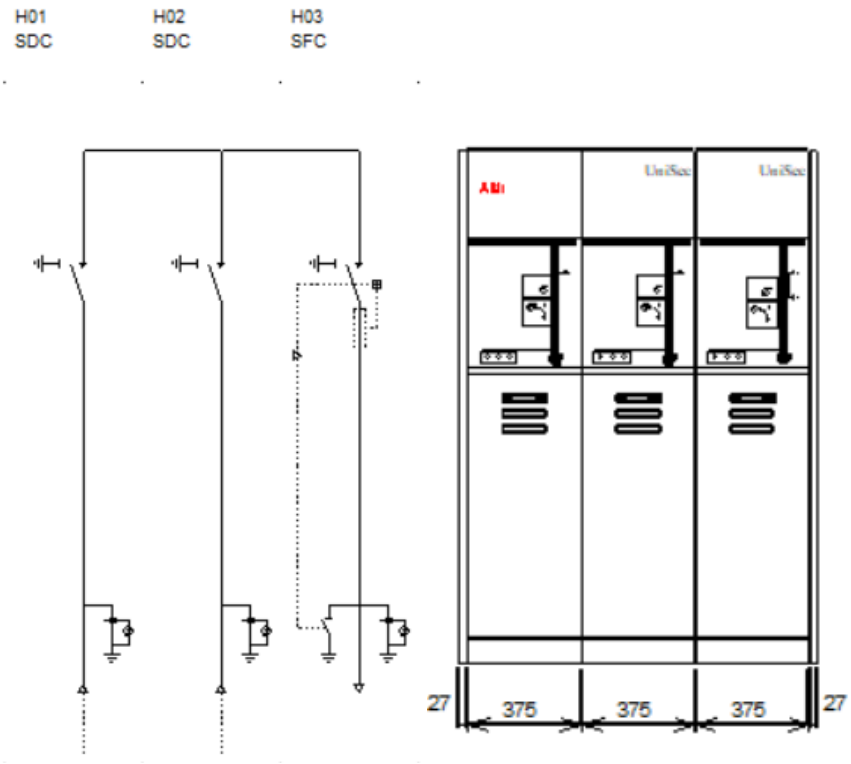
If Internal Arc with Filter **16kA AFLR**

- Depth is **1210mm**
- Weight to be considered is **+54kg** per Swg

If Internal Arc with Filter **20**, **21kA AFLR**:

- Depth is **1210mm**
- Height is **2000mm**
- Weight to be considered is **+81kg** per Swg

If **base frame** option is selected Height shall be increased of **+300mm**



3.4 CCFF (SDC,SDC,SFC,SFC)

Description	Qty	*Overall dimensions and weights (*)* Weight (Kg)	Width (mm)	Depth (mm)	Height(mm)
SDC (630 A) *H01, H02*	**2**	286	375	1070	1700
SFC (160 A) *H03, H04*	**2**	241	375	1070	1700
Sidewalls			54		
	4	***1054***	***1554***	***1070***	***1700***

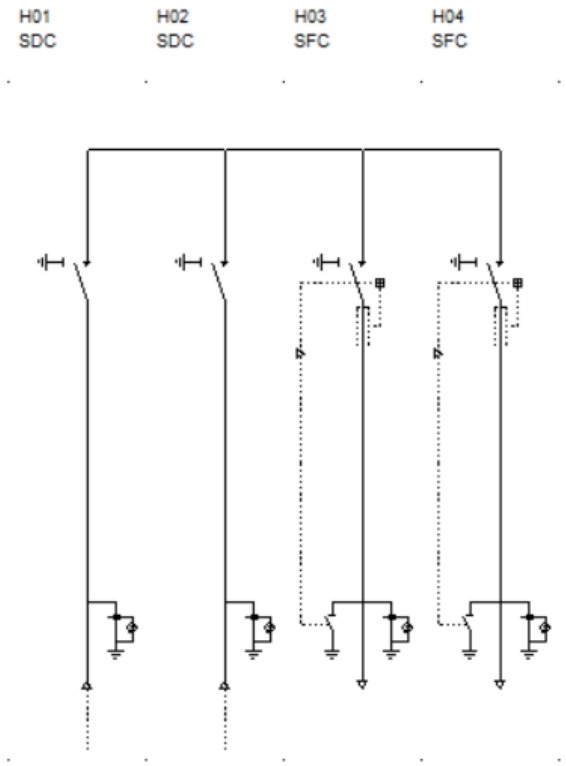
If Internal Arc with Filter **16kA AFLR**

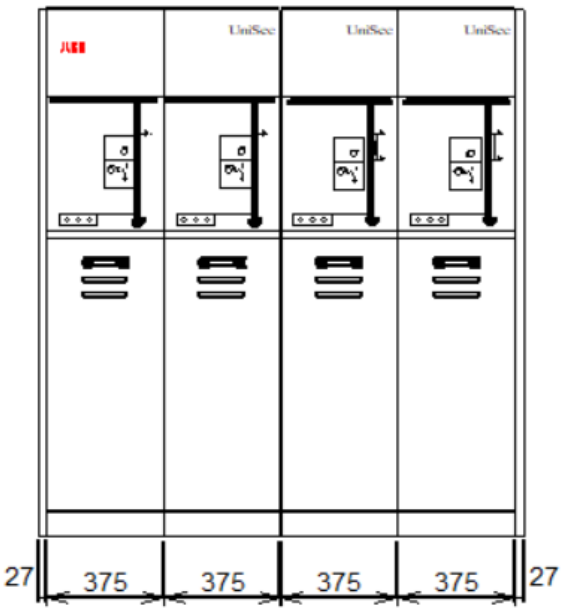
- Depth is **1210mm**
- Weight to be considered is **+72kg** per Swg

If Internal Arc with Filter **20**, **21kA AFLR**:

- Depth is **1210mm**
- Height is **2000mm**
- Weight to be considered is **+108kg** per Swg

If **base frame** option is selected Height shall be increased of **+300mm**





3.5 CCC (SDC,SDC,SDC)

Description	Qty	*Overall dimensions and weights (*)* Weight (Kg)	Width (mm)	Depth (mm)	Height(mm)
SDC (630 A) *H01, H02, H03*	**3**	286	375	1070	1700
Sidewalls			54		
	3	***808***	***1179***	***1070***	***1700***

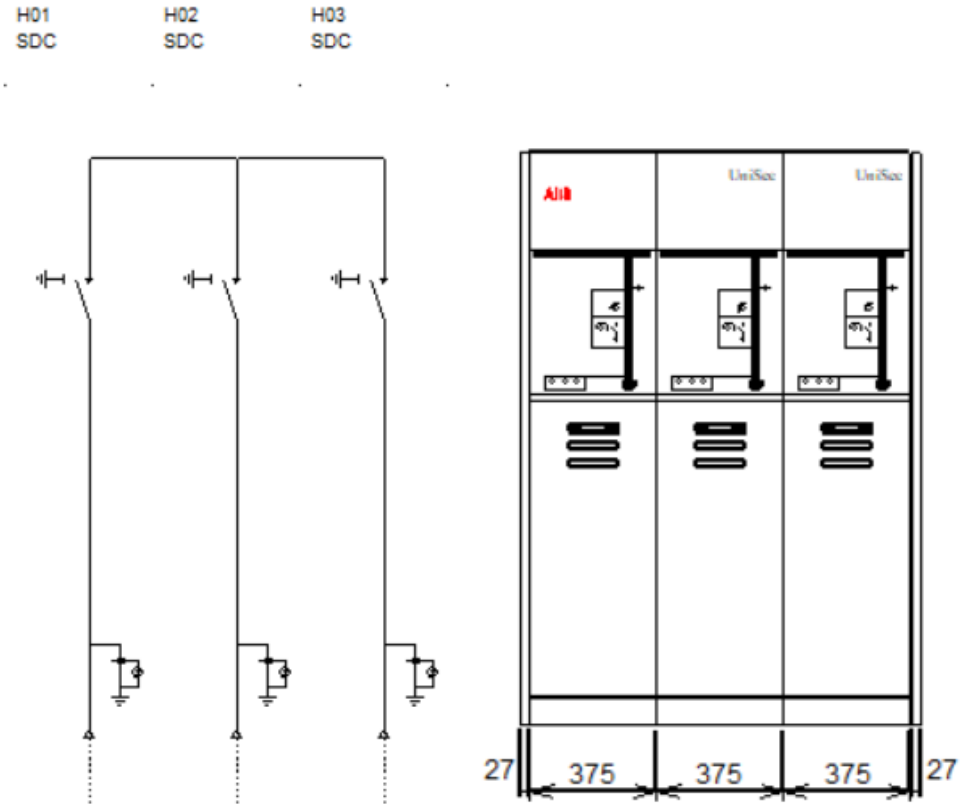
If Internal Arc with Filter **16kA AFLR**

- Depth is **1210mm**
- Weight to be considered is **+54kg** per Swg

If Internal Arc with Filter **20**, **21kA AFLR**:

- Depth is **1210mm**
- Height is **2000mm**
- Weight to be considered is **+81kg** per Swg

If **base frame** option is selected Height shall be increased of **+300mm**



3.6 CCCF (SDC,SDC,SDC,SFC)

Description	Qty	*Overall dimensions and weights (*)* Weight (Kg)	Width (mm)	Depth (mm)	Height(mm)
SDC (630 A) *H01, H02, H03*	**3**	286	375	1070	1700
SFC (160 A) *H04*	**1**	291	375	1070	1700
Sidewalls			54		
	4	***1049***	***1554***	***1070***	***1700***

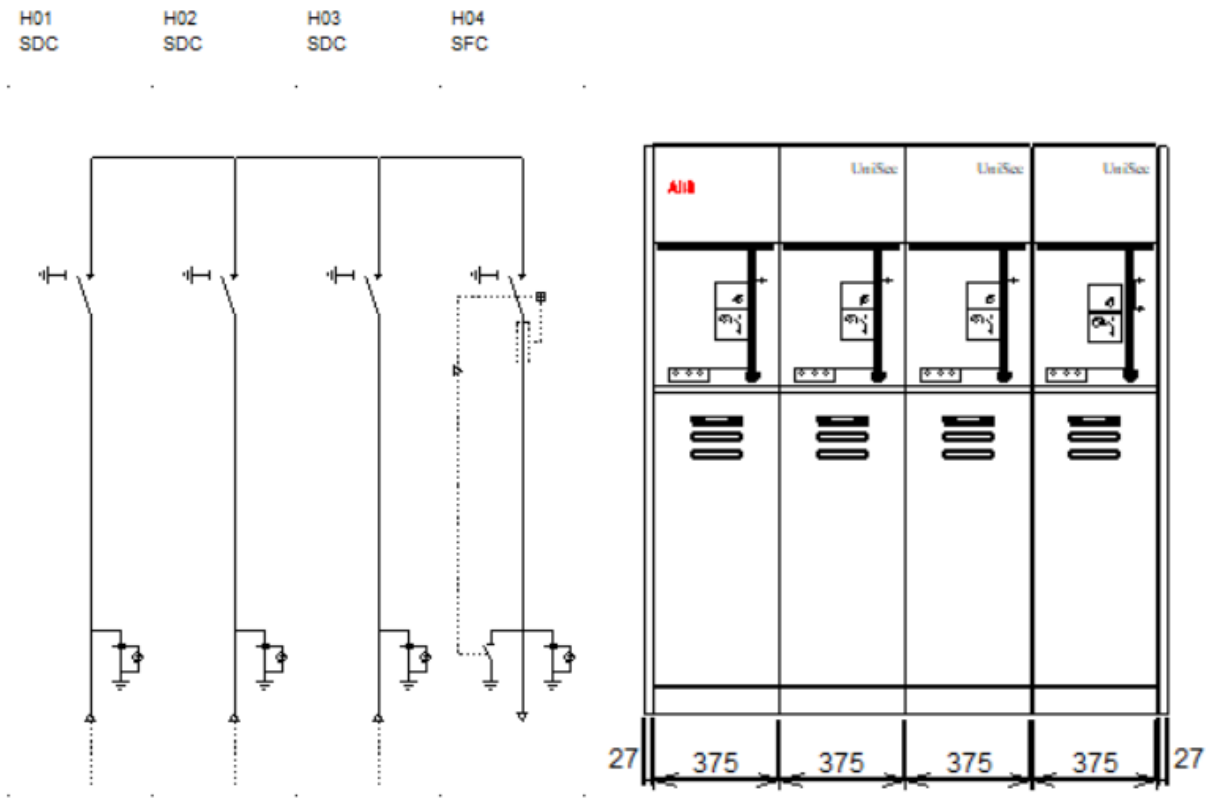
If Internal Arc with Filter **16kA AFLR**

- Depth is **1210mm**
- Weight to be considered is **+72kg** per Swg

If Internal Arc with Filter **20**, **21kA AFLR**:

- Depth is **1210mm**
- Height is **2000mm**
- Weight to be considered is **+108kg** per Swg

If **base frame** option is selected Height shall be increased of **+300mm**



3.7 CCCC (SDC,SDC,SDC,SDC)

Description	Qty	*Overall dimensions and weights (*)* Weight (Kg)	Width (mm)	Depth (mm)	Height(mm)
SDC (630 A) *H01, H02, H03, H04*	**4**	286	375	1070	1700
Sidewalls			54		
	4	***1044***	***1554***	***1070***	***1700***

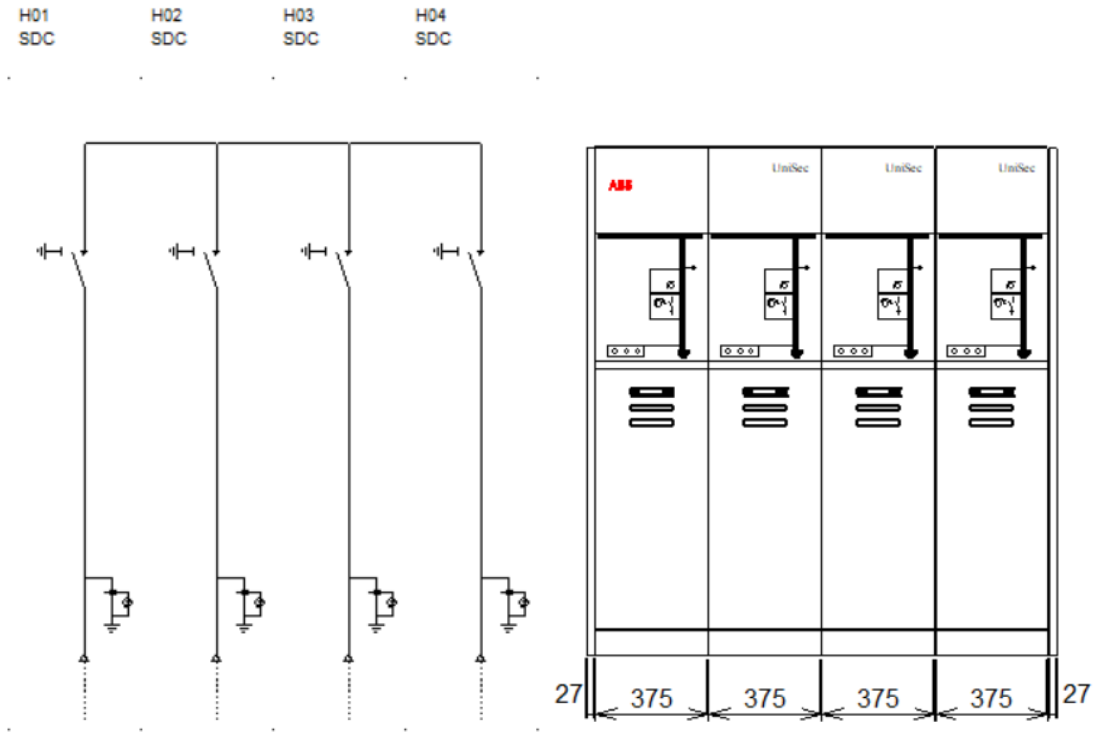
If Internal Arc with Filter **16kA AFLR**

- Depth is **1210mm**
- Weight to be considered is **+72kg** per Swg

If Internal Arc with Filter **20**, **21kA AFLR**:

- Depth is **1210mm**
- Height is **2000mm**
- Weight to be considered is **+108kg** per Swg

If **base frame** option is selected Height shall be increased of **+300mm**



3.8 DeV (DRC,HBC)

Description	Qty	*Overall dimensions and weights (*)* Weight (Kg)	Width (mm)	Depth (mm)	height(mm)
DRC (630 A) *H01*	**1**	195	500	1070	1700
HBC (630 A) *H02*	**1**	412	500	1180	2000
Sidewalls			54		
	2	***607***	***1054***	***1180***	***2000***

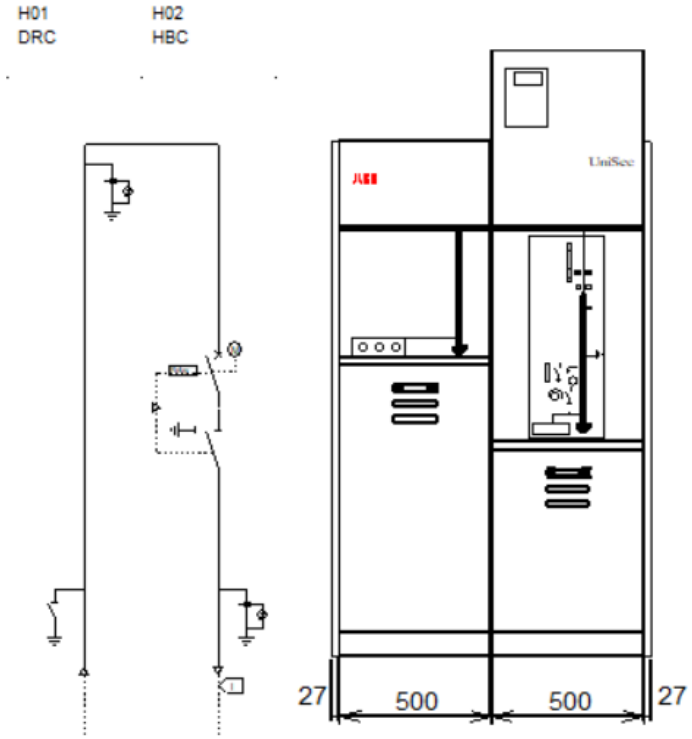
If Internal Arc with Filter **16kA AFLR**

- Depth is **1320mm**
- Weight to be considered is **+39kg** per Swg

If Internal Arc with Filter **20**, **21kA AFLR**:

- Depth is **1320mm**
- Height is **2000mm** (panel roof and LV compartment)
- Weight to be considered is **+61kg** per Swg

If **base frame** option is selected Height shall be increased of **+300mm**



3.9 DV (RLC,HBC)

Description	Qty	*Overall dimensions and weights (*)* Weight (Kg)	Width (mm)	Depth (mm)	height(mm)
HBC (630 A) *H01*	**1**	492	500	1180	2000
Sidewalls (including **RLC**)			217		
	1	***492***	***717***	***1180***	***2000***

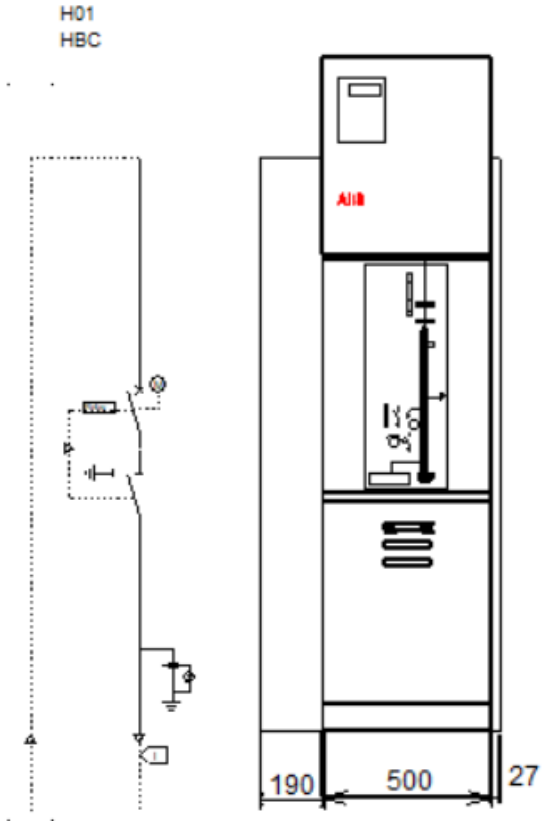
If Internal Arc with Filter **16kA AFLR**

- Depth is **1320mm**
- Weight to be considered is **+21kg** per Swg

If Internal Arc with Filter **20**, **21kA AFLR**:

- Depth is **1320mm**
- Height is **2000mm** (panel roof and LV compartment)
- Weight to be considered is **+34kg** per Swg

If **base frame** option is selected Height shall be increased of **+300mm**



3.10 CCV (SDC,SDC,HBC)

Description	Qty	*Overall dimensions and weights (*)* Weight (Kg)	Width (mm)	Depth (mm)	height(mm)
SDC (630 A) *H01, H02*	**2**	286	375	1070	1700
HBC (630 A) *H03*	**1**	412	500	1180	2000
Sidewalls			54		
	3	***934***	***1304***	***1180***	***2000***

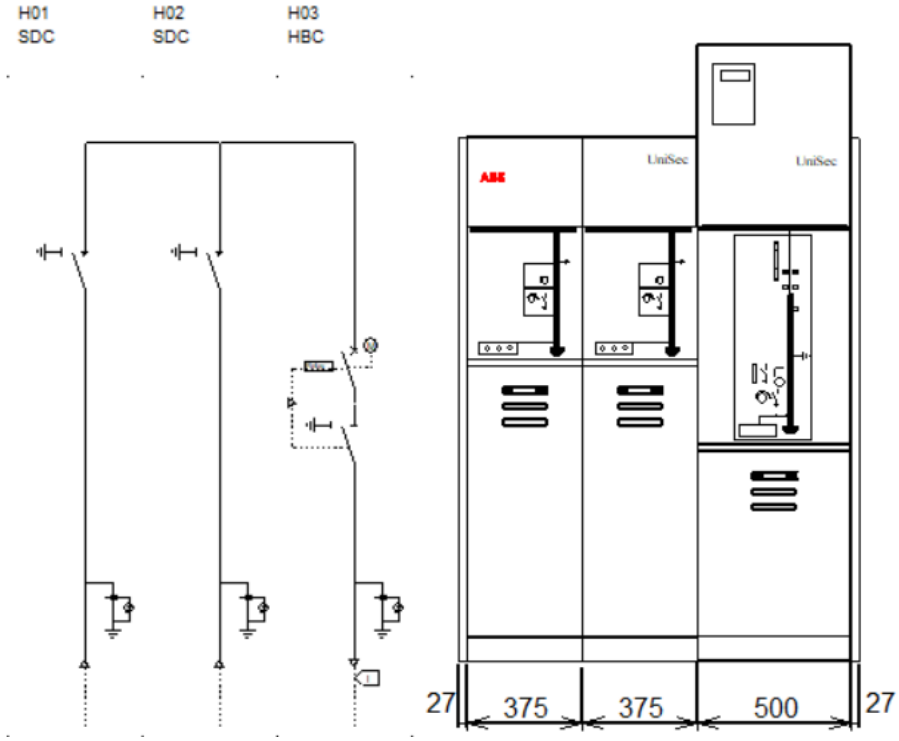
If Internal Arc with Filter **16kA AFLR**

- Depth is **1320mm**
- Weight to be considered is **+57kg** per Swg

If Internal Arc with Filter **20**, **21kA AFLR**:

- Depth is **1320mm**
- Height is **2000mm** (panel roof and LV compartment)
- Weight to be considered is **+88kg** per Swg

If **base frame** option is selected Height shall be increased of **+300mm**



3.11 CCCV (SDC,SDC,SDC,HBC)

Description	Qty	*Overall dimensions and weights (*)* Weight (Kg)	Width (mm)	Depth (mm)	height(mm)
SDC (630 A) *H01, H02, H03*	**3**	286	375	1070	1700
HBC (630 A) *H04*	**1**	412	500	1180	2000
Sidewalls			54		
	4	***1170***	***1679***	***1180***	***2000***

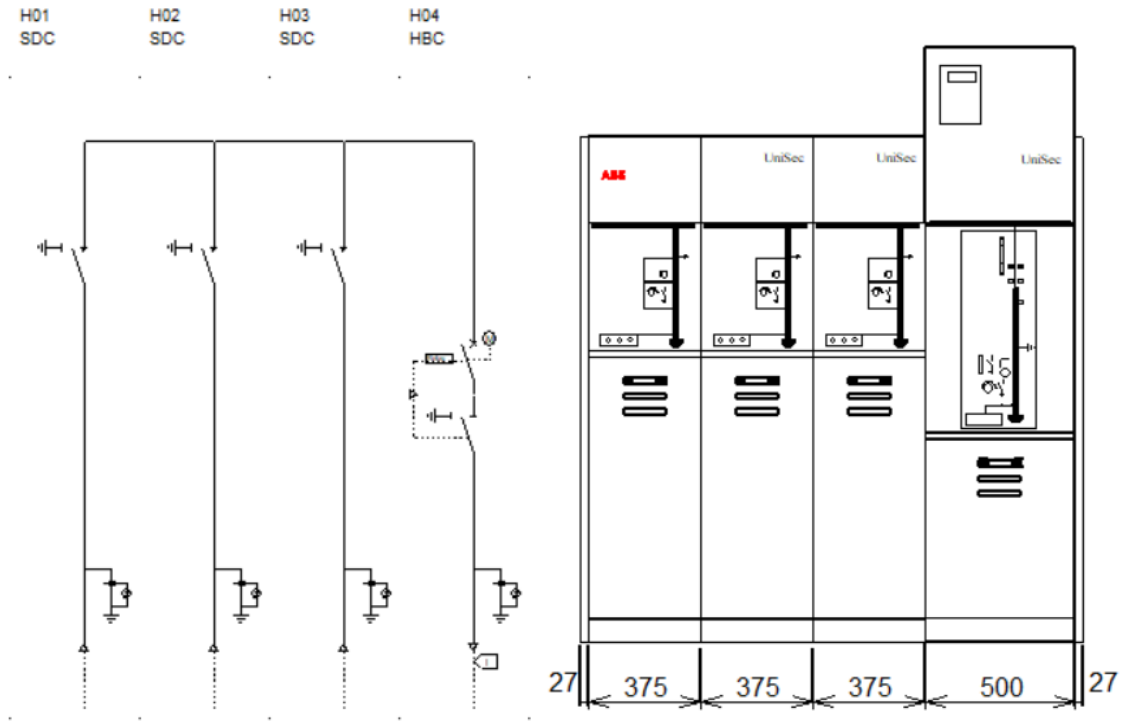
If Internal Arc with Filter **16kA AFLR**

- Depth is **1320mm**
- Weight to be considered is **+75kg** per Swg

If Internal Arc with Filter **20**, **21kA AFLR**:

- Depth is **1320mm**
- Height is **2000mm** (panel roof and LV compartment)
- Weight to be considered is **+115kg** per Swg

If **base frame** option is selected Height shall be increased of **+300mm**



3.12 CCVV (SDC,SDC,HBC,HBC)

Description	Qty	*Overall dimensions and weights (*)* Weight (Kg)	Width (mm)	Depth (mm)	height(mm)
SDC (630 A) *H01, H02*	**2**	286	375	1070	1700
HBC (630 A) *H03, H04*	**2**	412	500	1180	2000
Sidewalls			54		
	4	***1396***	***1804***	***1180***	***2000***

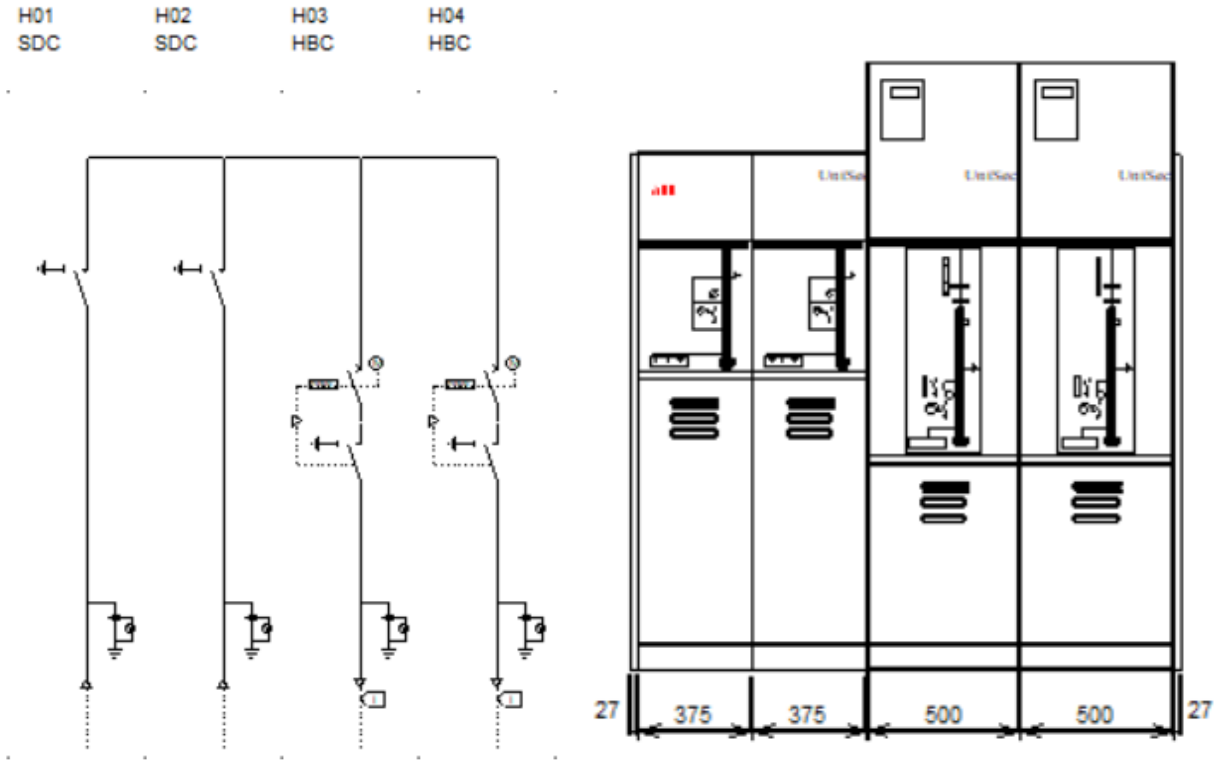
If Internal Arc with Filter **16kA AFLR**

- Depth is **1320mm**
- Weight to be considered is **+75kg** per Swg

If Internal Arc with Filter **20**, **21kA AFLR**:

- Depth is **1320mm**
- Height is **2000mm** (panel roof and LV compartment)
- Weight to be considered is **+115kg** per Swg

If **base frame** option is selected Height shall be increased of **+300mm**



3.13 CCBRmFF (SDC,SDC,HBS,DRS,SFC,SFC)

Description	Qty	*Overall dimensions and weights (*)* Weight (Kg)	Width (mm)	Depth (mm)	height(mm)
SDC (630 A) *H01, H02*	**2**	286	375	1070	1700
HBS (630 A) *H03*	**1**	432	500	1180	2000
DRS (630 A) *H04*	**1**	192	500	1180	2000
SFC (160 A) *H05, H06*	**2**	241	375	1070	1700
Sidewalls			54		
	6	***1678***	***2554***	***1180***	***2000***

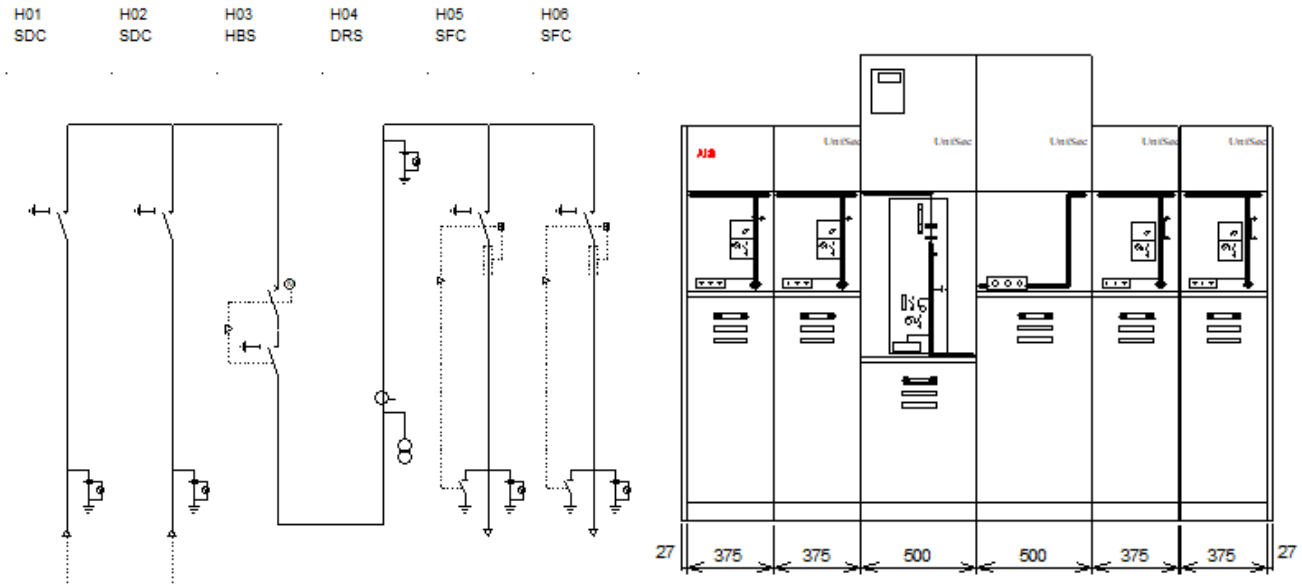
If Internal Arc with Filter **16kA AFLR**

- Depth is **1320mm**
- Weight to be considered is **+114kg** per Swg

If Internal Arc with Filter **20**, **21kA AFLR**:

- Depth is **1320mm**
- Height is **2000mm** (panel roof and LV compartment)
- Weight to be considered is **+176kg** per Swg

If **base frame** option is selected Height shall be increased of **+300mm**



3.14 CCBRmFV (SDC,SDC,HBS,DRS,SFC,HBC)

Description	Qty	*Overall dimensions and weights (*)* Weight (Kg)	Width (mm)	Depth (mm)	height(mm)
SDC (630 A) *H01, H02*	**2**	286	375	1070	1700
HBS (630 A) *H03*	**1**	432	500	1180	2000
DRS (630 A) *H04*	**1**	192	500	1180	2000
SFC (160 A) *H05*	**1**	241	375	1070	1700
HBC (630 A) *H06*	**1**	412	500	1180	2000
Sidewalls			54		
	6	***1849***	***2679***	***1180***	***2000***

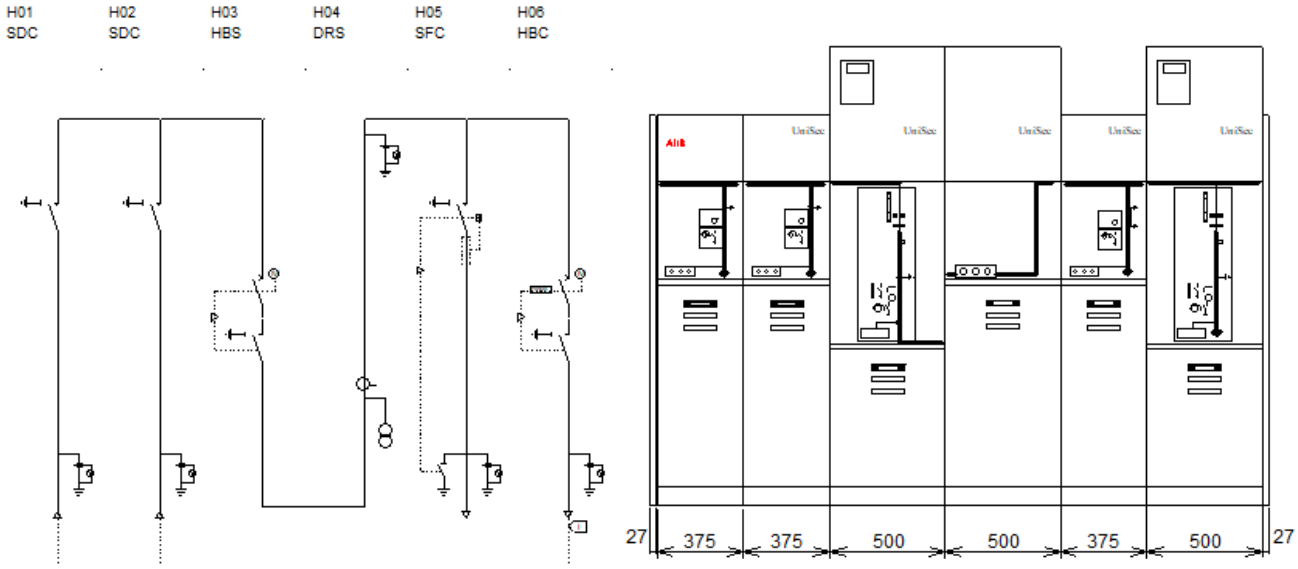
If Internal Arc with Filter **16kA AFLR**

- Depth is **1320mm**
- Weight to be considered is **+117kg** per Swg

If Internal Arc with Filter **20**, **21kA AFLR**:

- Depth is **1320mm**
- Height is **2000mm** (panel roof and LV compartment)
- Weight to be considered is **+183kg** per Swg

If **base frame** option is selected Height shall be increased of **+300mm**



3.15 VVBRmFF (HBC,HBC,HBS,DRS,SFC,SFC)

Description	Qty	*Overall dimensions and weights (*)* Weight (Kg)	Width (mm)	Depth (mm)	height(mm)
HBC (630 A) *H01, H02*	**2**	412	500	1180	2000
HBS (630 A) *H03*	**1**	432	500	1180	2000
DRS (630 A) *H04*	**1**	192	500	1180	2000
SFC (160 A) *H05, H06*	**2**	241	375	1070	1700
Sidewalls			54		
	6	***1930***	***2804***	***1180***	***2000***

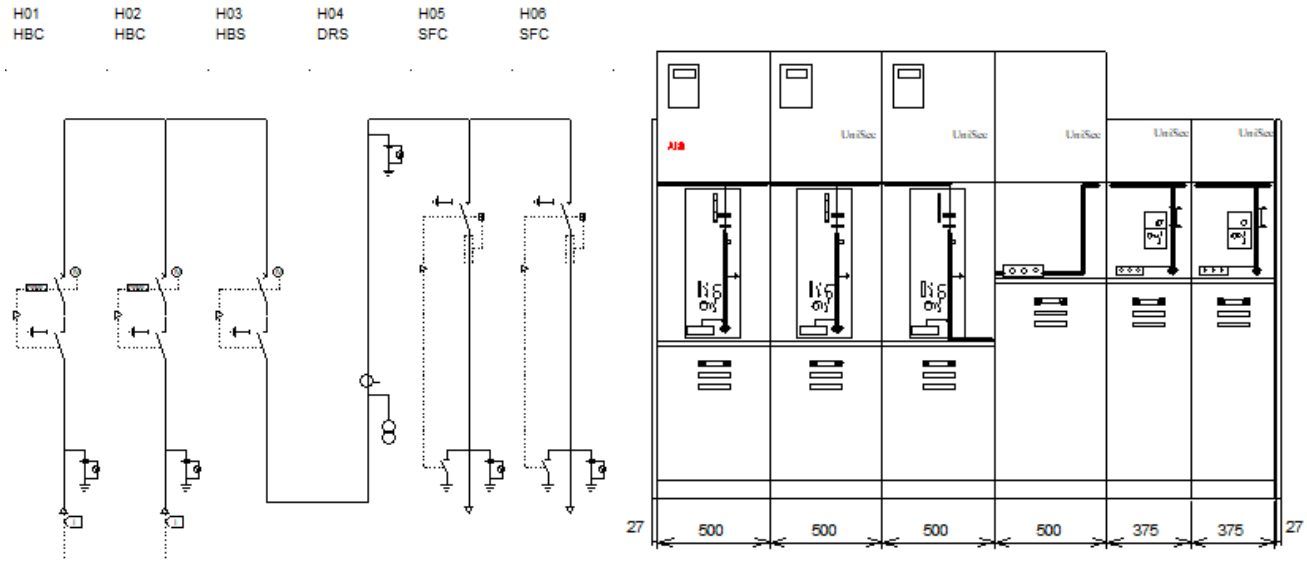
If Internal Arc with Filter **16kA AFLR**

- Depth is **1320mm**
- Weight to be considered is **+120kg** per Swg

If Internal Arc with Filter **20**, **21kA AFLR**:

- Depth is **1320mm**
- Height is **2000mm** (panel roof and LV compartment)
- Weight to be considered is **+190kg** per Swg

If **base frame** option is selected Height shall be increased of **+300mm**



3.16 VVBRmFV (HBC,HBC,HBS,DRS,SFC,HBC)

Description	Qty	*Overall dimensions and weights (*)* Weight (Kg)	Width (mm)	Depth (mm)	height(mm)
HBC (630 A) *H01, H02*	**2**	412	500	1180	2000
HBS (630 A) *H03*	**1**	432	500	1180	2000
DRS (630 A) *H04*	**1**	192	500	1180	2000
SFC (160 A) *H05*	**1**	241	375	1070	1700
HBC (630 A) *H06*	**1**	412	500	1180	2000
Sidewalls			54		
	6	***2101***	***2929***	***1180***	***2000***

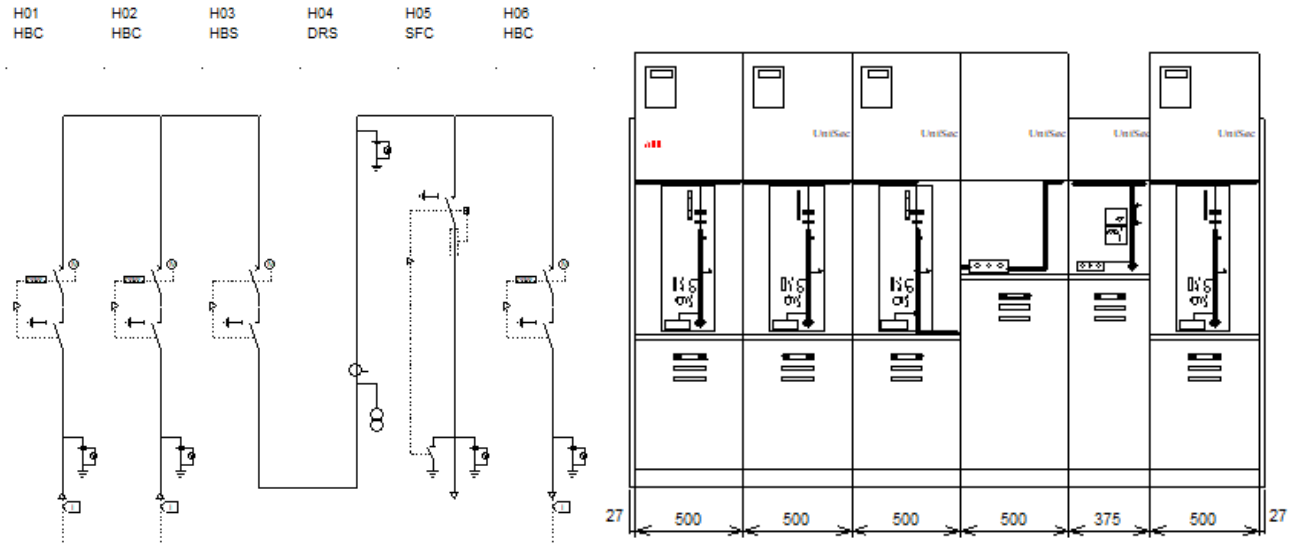
If Internal Arc with Filter **16kA AFLR**

- Depth is **1320mm**
- Weight to be considered is **+123kg** per Swg

If Internal Arc with Filter **20**, **21kA AFLR**:

- Depth is **1320mm**
- Height is **2000mm** (panel roof and LV compartment)
- Weight to be considered is **+197kg** per Swg

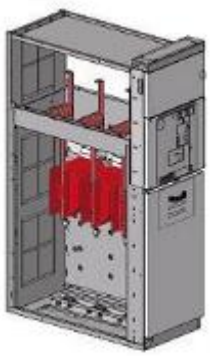
If **base frame** option is selected Height shall be increased of **+300mm**

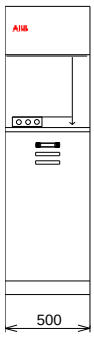


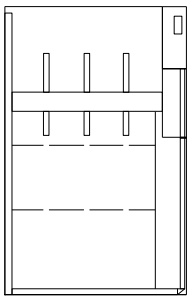
(*) *Dimensions calculate panel + accessories, lv box, IAC protection, …. For additional details, please refers to UniSec catalogue.*
ABB wishes to highlight that values of dimensions and weights provided herein are preliminary and may change after final design preparation, based on final scope of supply and installation details of the switchgear. As a consequence, provided values of dimensions and weights are not to be considered as final but only for standard reference purposes.
Accordingly, you expressly acknowledge and agree that values of dimensions and weights provided herein are neither final nor binding and that the result of their use is neither feasible nor accurate nor error free.

4 Typical Unit Description

4.1 Panel: De (DRC)







1 Panel type DRC, LSC1 - Direct riser unit with cable - 500mm
1 Cable entry for 1-phase cables up to 300 mm2 (Single core)
1 Voltage presence indicator with fixed lamps type VPIS
1 Installation and operating manual in Italian

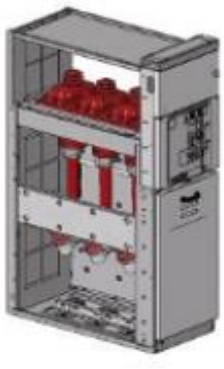
1 ABB standard earth key locks open

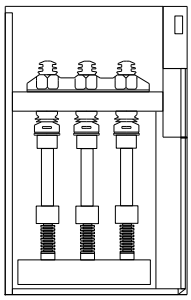
1 Earthing switch, full making capacity
1 Auxiliary contacts for earthing switch
Set of 4+4 pcs change-over

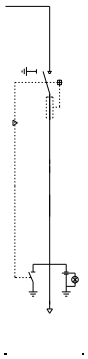
1 Low voltage compartment for 500mm functional unit
1 Necessary auxiliary circuit and MCBs are automatically included as per factory stds according panel configuration/selections.

Options
230VAC Heaters if ordered *(optional code at chapt. 1.2)*

4.2 Panel: F (SFC)







1 Panel type SFC, LSC2A - Switch-fuse combination unit with cable - 375 mm
1 Cable entry for 1-phase cables up to 95 mm2 (Single core)
1 Voltage presence indicator with fixed lamps type VPIS
1 Operating Handle for Switch-disconnector and Earthing switch

1 GSec - Three position double spring switch-disconnector with earthing switch

1 Tripping coil for opening 230 VAC
1 Downstream earthing switch with limited making capacity (2kA)
1 Fuse base 375 for fuses 442mm
1 Fuse tripping
1 Fuse blow indication (1NO)

1 Low voltage compartment for 375 mm functional unit
1 Necessary auxiliary circuit and MCBs are automatically included as per factory stds according panel configuration/selections.

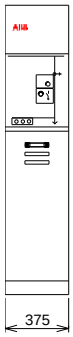
Options

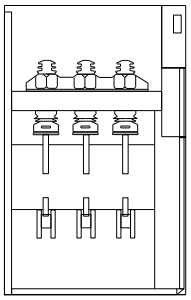
Motorized Fused Switch Disconnector if ordered	*(see optional code at chapt. 1.2)*
230VAC Heaters if ordered	*(see optional code at chapt. 1.2)*
Set of MV fuses if ordered	*(see optional code at chapt. 1.2)*

4.3 Panel: D (RLC)

1 Cable entry for 1-phase cables up to 300 mm2 (Single core)

4.4 Panel: C (SDC)





1 Panel type SDC, LSC2 - Switch disconnector unit - 375 mm
1 Cable entry for 1-phase cables up to 300 mm2 (Single core)
1 Voltage presence indicator with fixed lamps type VPIS
1 Installation and operating manual in Italian

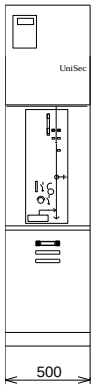
1 GSec - Three position single spring switch-disconnector with earthing switch

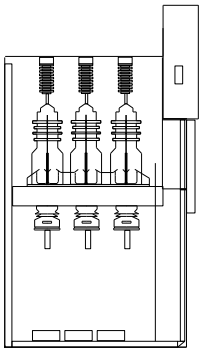
1 Low voltage compartment for 375 mm functional unit
1 Necessary auxiliary circuit and MCBs are automatically included as per factory stds according panel configuration/selections.

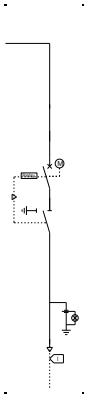
Options

Motorized Switch Disconnector if ordered	*(see optional code at chapt. 1.2)*
Short Circuit Indicator if ordered	*(see optional code at chapt. 1.2)*
230VAC Heaters if ordered	*(see optional code at chapt. 1.2)*

4.5 Panel: V (HBC)







1 Panel type HBC, LSC2 - Circuit-breaker with switch-disconnector integrated - 500 mm
1 Cable entry for 1-phase cables up to 300 mm2 (Single core)
1 Operating Handle for Switch-disconnector and Earthing switch

1 ABB standard key locks for line open / closed free
1 ABB standard earth key locks closed / opened (2 locks for earthing)

1 Wide low voltage compartment for 500 mm functional unit
1 Necessary auxiliary circuit and MCBs are automatically included as per factory stds according panel configuration/selections.

1 Multifunctional apparatus, type HySec (vacuum) 24kV, 630A, 16kA
1 Closing push button
1 Opening push button
1 Mechanical signalling device for closing springs
1 Mechanical signalling device for circuit breaker
1 Operation counter
1 Shunt opening release 230 VAC
1 Shunt closing release 230 VAC
1 Spring charging motor 230 VAC
1 Set of 6 open / closed auxiliary contacts
1 Lock push buttons
1 Cover for open/close push buttons
1 Auxiliary contacts for switch-disconnector closed
Set of 4 pcs change-over
1 Auxiliary contacts for earthing switch
Set of 4 pcs change-over
1 Electrical indication for charged spring
1 Voltage presence indicator system

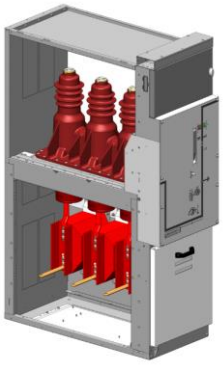
3 Current Sensor KECA 250 B1 and twister cable RJ45 (set 1, Ip=200 A, Polarity: P1 on busbar side)

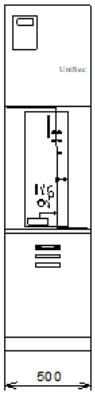
1 REF601 - Feeder protection relay
1 English
1 Local Control Voltage (230VAC50 OR 230VAC60)
Analog inputs: 3 sensor and ground CT
Three-phase overcurrent protection, high-set stage (50-51)
Non-directional earth-fault, instantaneous stage (50N/51N)
Three-phase inrush detector (68)
Modules: Serial RS-485
Protocol: Modbus RTU
Power supply: 24-240 Vac/Vdc

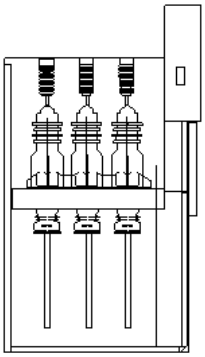
Options

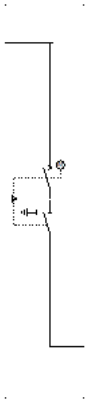
Motorized Circuit Breaker if ordered	*(see optional code at chapt. 1.2)*
230VAC Heaters if ordered	*(see optional code at chapt. 1.2)*

4.6 Panel: B (HBS)









1 Panel type HBS, LSC2 - Circuit-breaker with switch-disconnector integrated - 500 mm

1 Wide low voltage compartment for 500 mm functional unit
1 Necessary auxiliary circuit and MCBs are automatically included as per factory stds according panel configuration/selections.

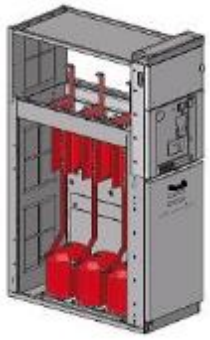
1 Multifunctional apparatus, type HySec (vacuum) 24kV, 630A, 16kA
1 Closing push button
1 Opening push button
1 Mechanical signalling device for closing springs
1 Mechanical signalling device for circuit breaker
1 Operation counter
1 Shunt opening release 230 VAC
1 Shunt closing release 230 VAC
1 Spring charging motor 230 VAC
1 Set of 6 open / closed auxiliary contacts
1 Lock push buttons
1 Cover for open/close push buttons
1 Auxiliary contacts for switch-disconnector closed
Set of 4 pcs change-over
1 Auxiliary contacts for earthing switch
Set of 4 pcs change-over
1 Electrical indication for charged spring
1 Voltage presence indicator system

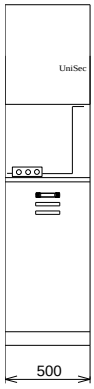
1 REF615-F Directional overcurrent and earth-fault protection with ph-volt based measur., undervoltage and overvoltage
1 English
1 Local Control Voltage (230VAC50 OR 230VAC60)
Analog inputs and Binary I/O option: 4I, Io 1/5 A + 5U + 16 BI + 10 BO
Protocol: Modbus RTU
Protocol: IEC 61850 + Modbus (for Ethernet or serial + Ethernet communication modules)
Small LCD, (4 rows), English, IEC ABB standard
Modules: Serial RS-485, incl. an input for IRIG-B + Ethernet 100Base-TX (1 x RJ-45)
Power supply: 48-250 Vdc, 100-240 Vac
Included: Voltage adapter AC/DC

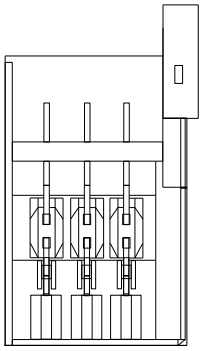
Options

Motorized Circuit Breaker if ordered	*(see optional code at chapt. 1.2)*
230VAC Heaters if ordered	*(see optional code at chapt. 1.2)*

4.7 Panel: Rm (DRS)







1 Panel type DRS, LSC1 - Direct riser unit for sectionalizing - 500 mm
1 Voltage presence indicator with fixed lamps type VPIS

1 Wide low voltage compartment for 500 mm functional unit
1 Necessary auxiliary circuit and MCBs are automatically included as per factory stds according panel configuration/selections.

3 Cast Epoxy DIN CT 12-17-24kV *(see product order code at chapt. 1)*
Ip=100-200 A, sec.reconn. (set 1, Ip=200 A, Polarity: P1 on busbar side)
Core1 : Is=1A; 2VA; 0.5/5P20
Core2 : Is=1A; 10VA; 0.5; fs 5
Frequency: 50Hz

3 Cast Epoxy DIN VT Phase-earth – 10-15-20/V3 *(see product order code at chapt. 1)*
Core 1 : Us=0,1/V3 kV; 10 VA; 0.5
Core 2 : Us=0,1/3 kV; 50 VA; 3P
Frequency: 50Hz
1 Damping resistor 600 W, 100 V = 22 Ohm

Options
230VAC Heaters if ordered *(see optional code at chapt. 1.2)*

5 General remarks and clarifications

1) Both the offered equipment and switchboards are in accordance with the international IEC Standards.

2) The switchboard will be tested in the ABB workshops, according to the normal tests for acceptance of switchboards foreseen by IEC Standards.

3) Our quotation does not include:

- Power cables terminals and connections
- Erection and commissioning
- On site tests
- Spare parts
- Engineering and design beyond our scope of supply:
    - relay setting calculations
    - relay protection coordination/selectivity study
    - ITs calculations
    - network study
    - calculation of the short circuit current
    - pressure calculation of the building
    - etc..
- All LV, MV control and power cables out of our panels and related cable sealing
- Means of hoisting for site unloading and transportation
- Factory tests other than routine IEC tests
- Any floor mounting accessory/material (metallic profiles, bolts, nuts, etc.) needed for site erection
- laptop or computer for setting of control and protection unit
- Training
- Civil works
- Any other equipment other than specified in our technical schedule.
- All what is not expressly described (excluding those accessories or devices which are essential for a good performance of the switchboard).

4) The following documentation in English language will be part of our supply:

- For approval (twofold):
    - Front and single line of the switchboards
    - Front of each typical unit
    - Foundation drawings
    - Schematic diagram of each typical unit
- Final as-built (threefold) in addition to the above mentioned documentation:
    - Equipment list
    - Catalogues of the switchboard, and circuit breakers
    - Instruction manuals of the switchboards and circuit breakers
    - Catalogues of the protection relays

  We engage ourselves to submit to your technicians the as-built documentation at the moment of the acceptance test of each lot of the supply in order to get your formal acceptance of the same.
  Relevant documentation will be sent to you by courier within 10 working days from the shipment of the lot itself.
  In case such documentation will be considered by you defective and/or not sufficient you should communicate us, by registered letter, within 15 days from the receipt of the documentation itself the degree of in-completion and/or the requested modifications. In case we will not get any comment from you within or later than the 15th day from the receipt of the documentation

it is agreed that you could not oppose any argument about the in-completion of the documentation in order to the observance of agreed term of payment.

5) The treatment and painting cycle will according to our standards and the colour of external painted surfaces will be RAL7035 (if not differently written into additional data section).

6) Our internal quality system is certified as per UNI EN ISO 9001 (ISO 9001).

7) Our quotation has been processed considering the following documentation:

With the following remarks and/or specifications:

6 Routine Tests

The routine test reports will be sent with project documentation.
Factory Acceptance Test -FAT- is not part of the offer.

7 Service Proposal

7.1 Service

The Service offers worldwide services for maintenance, retrofitting, supply of spare parts, training, erection and commissioning of medium voltage switchgear. The Service team offers services in close collaboration with the worldwide ABB Service network. The main activities are described below. Please contact your local ABB Service center for further information regarding the equipment you have installed. The “Customer Service Plan” is a package of personalized services for after-sales support. These services range from basic product support to full life cycle management of an installation. Customers can select the mix of services which best suits their specific needs. All the services offered apply to both the switchgear and the apparatus and are grouped into the five main categories specified below.

7.2 Installation Services

Installation

The installation service for our range of medium voltage apparatus and switchgear includes:

- decommissioning and removal of old switchgear
- site supervision
- installation and assembly of new apparatus.

Commissioning

Qualified technicians perform commissioning of the switchgear and protection and control systems, as part of our supply, and this includes:

- simulation commissioning to check operation of the protections and controls.
- commissioning with energization of the apparatus.
- supervision during start-up of the installation.

7.3 Corrective Services

Spare Parts

ABB keeps a comprehensive stock of spare parts both for products in production and phased-out products. The spare parts, of single components and complete systems, can also be available at the Service units of the whole ABB network. Spare parts can be purchased in the following ways:

- directly from our spares warehouse, as and when required.
- by means of a rental formula or by purchasing as spare stock or to be included in a Service contract.

Workshop and Site Repairs
ABB Service has fully equipped workshops to repair or refurbish both our own and other ABB companies' products and switchgear, whether these are products in production or phased-out.
In our workshops we check the conditions of the apparatus and recommend replacement of possible parts and repair according to the original specifications. When suitable, site repairs can be performed on a call out basis.

7.4 Preventive Services

Preventive Maintenance
Preventive maintenance is the key to ensure the reliability of installed switchgear. Accordingly, ABB offers a range of preventive maintenance services for our medium voltage products. Planned preventive Service is offered either on a call out basis or as part of a maintenance contract.

Condition Monitoring
ABB offers various condition monitoring solutions to measure the main parameters of the installed equipment. The monitoring systems can be fitted to existing apparatus to provide information on the specific conditions of a system. This means it is possible to program plant stoppages for maintenance in a flexible and suitable way.

7.5 Value Added Services

Site Audits
As a world leader in the field of medium voltage switchgear with many years of proven experience in different applications, ABB is able to carry out audits on the functional performance of existing apparatus. A typical audit would include:

- checking the documentation of the substation apparatus.
- assessment of the conditions of the apparatus.
- recommendations on maintenance, replacement or retrofitting.

Consulting Service
ABB provides a range of consulting services on medium voltage switchgear, which includes:

- recommendations for product application, their upgrading or replacement.
- troubleshooting and diagnostics.
- switchgear decommissioning and disposal.
- personnel training.
- safety.

Extended Warranty
Customers can ask for an extended warranty for their medium voltage switchgear. This option can be purchased with new apparatus, or be taken up during and after the period of validity of the original product warranty.

Retrofit, Life Extension and Upgrades
In view of the demand for continuous improvement and optimization in managing assets and plants, ABB provides solutions which allow the useful life of medium voltage switchgear to be extended. The options available include:

- complete overhauling and refurbishment of switchgear, in accordance with the original specification with warranty.
- apparatus upgrading by means of retrofitting switching, protection and control devices.
- protection and control device upgrading for the highest levels of the protection and control systems.
- product upgrading to increase safety (for example, by means of installation of electric arc detection devices and systems.

Service Contract
To guarantee efficiency of the apparatus installed, we also offer our services on a contract base. Each contract is worked out individually according to the customer's requirements.

7.6 Training Center

Specific training courses on apparatus, releases and switchgear are organized at the ABB facility in Dalmine.
The courses programs cover description of the products and their components, instructions for use, installation and ordinary maintenance. The courses are held in a classroom for the indispensable theoretical part and to a large extent in the laboratory in front of the apparatus itself, therefore putting the emphasis on direct practical application of the knowledge acquired.

- On request, courses on phased-out products can be organized, adapting the program to specific requirements.
- The participants are given help with the operations for their transfer, hotel bookings, permits from the authorities and for all their logistic needs.
- A certificate of attendance is issued at the end of the course.

Contact us

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Codice Fiscale/ *Fiscal code*:
00736410150
Registro delle imprese di Milano/
Official Company Book: 00736410150
R.E.A. Milano: 1513225

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Garbagnate Monastero (LC)
Marostica (VI)
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Santa Palomba (Roma)
Vittuone (MI)

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