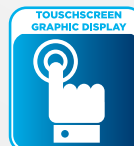
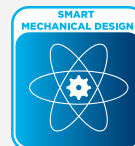


SD700FR

VARIABLE SPEED DRIVES

Regenerative Active Front End



SD700FR

SD700FR SERIES goes one step ahead keeping the family unique characteristics. Based on the latest active front end technology, they are able to: regenerate the braking energy, reduce the THDi<5%^[1], adjust the cosine phi and keep it constant at any load condition, and keep the motor voltage constant even when high input voltage drops occur.

SD700FR provides the best regeneration features. Save money reducing your energy bills and increasing the process performance at the same time!

[1]Harmonics are below the limits defined in IEEE519 for all ISC/IL

SAVE MONEY REDUCING YOUR
ENERGY BILLS AND INCREASING
THE PROCESS PERFORMANCE AT
THE SAME TIME!

- IP54 WITHOUT DUST FILTERS
- 50°C OPERATION WITHOUT POWER DERATING
- (FFA) FULL FRONTAL ACCESS
- ACTIVE FRONT END AND LCL FILTER MODULAR POWER STAGE
- REGENERATIVE DRIVE 4Q
- ADJUSTABLE DISPLACEMENT POWER FACTOR
- BUILT-IN RFI FILTER
- BUILT-IN DV/DT FILTER 500V/μS-800VμS (UNSCREENED CABLE UP TO 300M)
- CONFORMALLY COATED ELECTRONICS WITH MILITAR AND AEROSPACE TECHNOLOGY

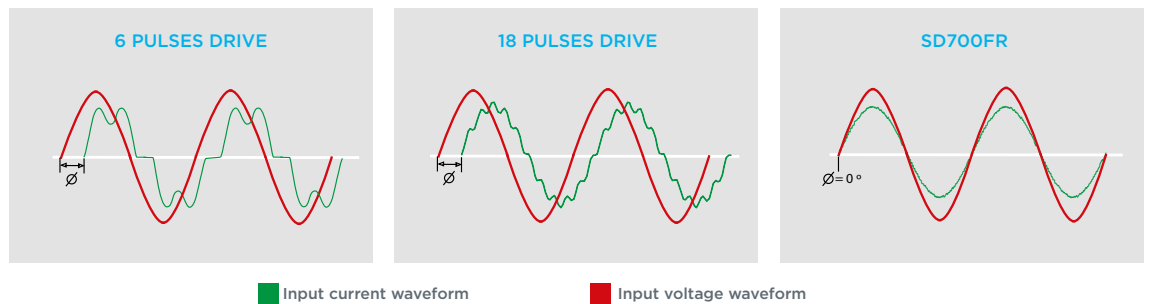


WHAT IS THE ACTIVE FRONT END TECHNOLOGY?

The traditional thyristor-diode rectifier has been replaced by a controlled Isolated Gate Bipolar Transistor (IGBT) bridge. This bridge is operated by its own control and power board that creates an almost sinusoidal input current wave.

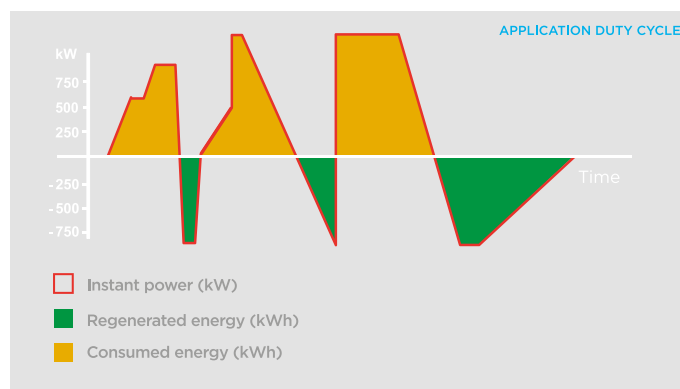
This technology reduces the THDi with the highest efficiency and space savings. Furthermore the $\text{Cos}\Phi = 1.0$ is adjustable and will be kept at any load condition. Forget the capacitor bank installation, additional bill charges and transformer and wiring overheating!

The active front end technology substitutes the multipulse drives and passive filters. The multipulse solutions have: higher installation cost by means of special transformers and wiring requirements, no cosine phi control, filtering features load dependant, higher input voltage drops and no regeneration capacity.



ENERGY REGENERATION - 4 QUADRANT OPERATION

The best regeneration features are provided by the SD700FR. Some applications such as cranes, downhill conveyors, centrifuges pumps and fans generate a huge amount of energy during braking periods. This energy has been traditionally dissipated in braking units constructed by resistors. The SD700FR goes one step ahead giving the regenerated energy back to the grid, saving energy and providing low harmonic distortion at the same time.

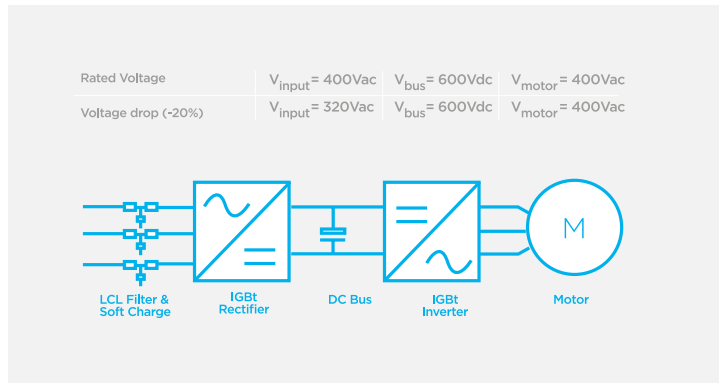


COMPLETE AND FULLY TESTED SOLUTION

Forget about buying independent AFE and motor units that are separate solutions. It is a truly tested and optimized solution. The rectifier and inverter bridge integrates a control and a power board each. They are communicated and synchronized by fibre optics, monitoring the input and output electric parameters continuously.

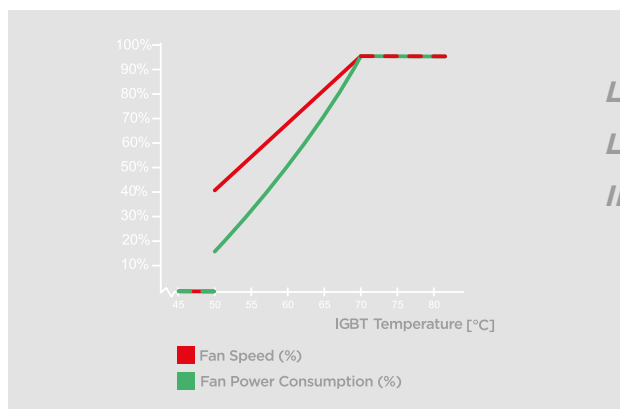
ARE YOU AFRAID BECAUSE OF YOUR WEAK GRID?

This is your best solution, the IGBT rectifier bridge allows a constant DC bus voltage under the most demanding voltage dips. Even when high voltage drops occurs, the drive will provide the rated motor voltage.



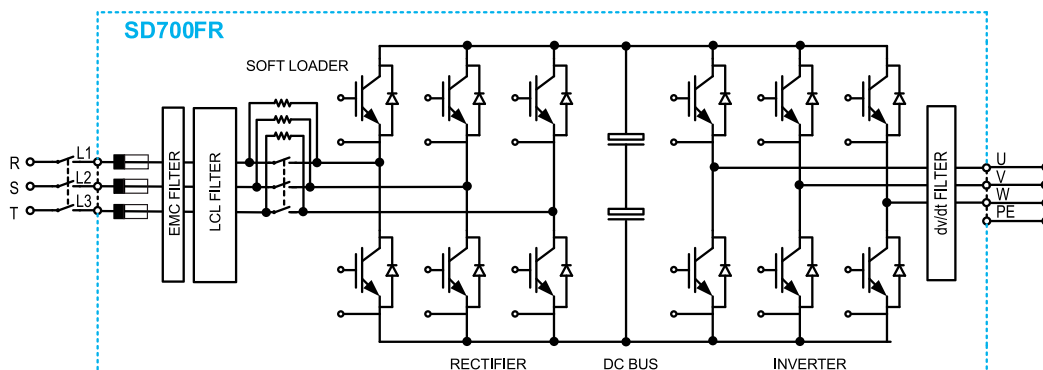
VARIABLE SPEED COOLING

When savings are a must, the design goes one step ahead integrating a variable speed system for the cooling fans that vary the air speed depending on the IGBT's temperature. This way, not only does the SD700FR reduce the stand-by consumption at low capacity but also reduces the environment noise level and increases the fans' lifetime.



LESS ENERGY CONSUMPTION
LESS NOISE POLLUTION
INCREASE FAN'S LIFETIME

SD700FR OPERATIONAL DIAGRAM



SD700 FR SERIES

Technical Characteristics

SD700 FR SERIES

INPUT	Power range	110kW - 2000kW [1]	
	Voltage power	380-480Vac, 525Vac, 690Vac , 3 phases (±10%)	
	Multipulse	-	
	Input frequency	50Hz/60Hz ± 6%	
	Input rectifier technology	IGBT	
	Rectifier bridge Switching Frequency	2.8kHz	
	Displacement power factor (DPF = cos Φ)	1 (factory settings)	
	Power factor (PF= I _r /I _{rms} · cos Φ)	0.90 leading ... 0.90 lagging (adjustable)	
	Momentary power loss	≥0.98	
	EMC input filter	> 2sec (depending on the load inertia)	
	Harmonics filter	Second environment (Industrial): (C3 Standard) First environment (Domestic): C2 (Optional). C1 consult Power Electronics	
	Current THDi (%)	LCL ≤ 3% / 5% [2]	
	Regenerative	Yes - 4 quadrant operation	
OUTPUT	Output frequency [3]	0... 200Hz	
	Overload capacity	Constant torque/heavy duty: 150% during 60 sec at 50°C Variable torque/normal duty: 120% during 60 sec at 40°C.	
	Efficiency (at I _n and at V _n)	≥97%	
	Control method	V/Hz VECTOR CONTROL	
	Switching frequency	Open Loop: PMC: speed (OLSP)/torque control (OLTQ), AVC: speed(OLSP) / torque control (OLTQ) Close Loop (Encoder): PMC:speed (CLSP)/torque control (CLTQ), AVC: speed(CLSP)/torque control (CLTQ)	
	Output dV/dT filter	4-8kHz -PEWave	
	Output cable length [4]	500 to 800V/μs USC 300m SC 150m	
	Dynamic brake	-	
	ENVIRONMENTAL CONDITIONS	Operation ambient temperature	Minimum: -20°C Maximum: +50°C
		Storage temperature	Minimum: -40°C Maximum: +70°C
Altitude		1000m	
Power altitude derating [1]		>1000m, 1% PN(kW) per 100m; 4000m maximum	
Ambient humidity		<95%, non-condensing	
Degree of protection		IP20, IP54	
Vibration		Deflection: 0.075mm (10Hz-57Hz), Acceleration: 9.8m/s ² (57Hz-150Hz)	
Heating resistors	Optional		
PROTECTIONS	Motor protections	Rotor locked, Motor overload (thermal model), Output current limit, Phase current imbalance, Phase voltage imbalance, Motor over-temperature (PTC signal), Speed limit, Torque limit.	
	Drive protections	Overload, IGBT's overload, Input phase loss, Low input voltage, High input voltage, DC Bus voltage limit, Low DC Bus voltage, High input frequency, Low input frequency, IGBT temperature, Heat-sink over-temperature, Power supply fault, Drive thermal model, Ground fault, Software and Hardware fault, Analogue input signal loss (speed reference loss), Safe stop / Emergency stop.	
INPUTS/OUTPUTS	Digital inputs	6 programmable active high (24Vdc), Isolated power supply 1 PTC input,	
	Digital outputs	3 Programmable changeover relays (250Vac, 8A or 30Vdc, 8A)	
	Analogue input	2 Programmable differential inputs: 0 - 20mA, 4 - 20mA, 0 - 10Vdc and ±10Vdc. Optically isolated.	
	Analogue outputs	2 Isolated programmable outputs: 0 - 20mA, 4 - 20mA, 0 - 10Vdc and ±10Vdc	
	Encoder inputs (optional)	Differential encoder input. Voltages inputs from 5 to 24Vdc	
	User power supply	+24Vdc user power supply (Max 180mA) regulated and short-circuit protected +10Vdc user power supply (Max 2 potentiometers R= 1 kΩ) regulated and short-circuit protected	
	I/O Extension board (optional)	4 Digital Inputs: Programmable inputs and active high (24Vdc). Optically isolated. 1 Analogue Input: Programmable and differential input. 5 Digital Outputs: Programmable multi-function relays.	
	External power supply (optional)	1 Analogue Output: Programmable outputs in voltage / current. 24 V External Power Supply, Fault Relay integrated	

NOTES [1] Other configuration, consult Power Electronics.
[2] THDi < 3% (THDv = 0%). Harmonics are below the limits defined in IEEE519 for all I_{sc}/I_L

[3]: For operation frequencies higher than 100Hz consult Power Electronics.

[4] SC: Shielded cable, USC: Unshielded Cable. Follow Power Electronics installation recommendations. For greater cable lengths consult Power Electronics.

SD700 FR SERIES

Technical Characteristics

SD700 FR SERIES

COMMUNICATION	Standard hardware	USB port RS232 port RS485 port
	Standard protocol	Modbus-RTU Profibus-DP DeviceNet
	Optional protocol	Ethernet (Modbus TCP) Ethernet IP CAN Open N2 Metasys Gateway
CONTROL PANEL	Type	Removable
	Length	3 meters and 5 meters (optional)
	Connection	RJ45
	Visualization leds	LED ON: Control board is energized LED RUN: Motor receiving power supply LED FAULT: Flashing displays that a fault has occurred
	Alphanumeric display	4 lines x 16 characters Keypad with 6 keys to control and configure the drive, start and stop/reset Independent memory
	Display information	Average current and 3-phase motor current Average voltage and 3-phase motor voltage Average input voltage and 3-phase input voltage 3-phase input and output frequency DC Bus Voltage Drive Status Speed, Torque, Power, Power factor of motor Register of total and partial drive running time with reset function. (hours) Register of total and partial drive energy consumption with reset function (kWh) Register of total and partial energy regenerated with reset function (kWh) Relay status Digital inputs / PTC status Output comparator status Analogue inputs and sensor values Analogue output value Motor overload and equipment status Drive and rectifier temperature Fault history (last 6 faults)
	Others	Real time clock Perpetual calendar Adjustable DC bus voltage
REGULATIONS	Certifications	CE, cTick, UL ^[5] , cUL ^[5]
	Electromagnetic compatibility	EMC Directive (2004/108/CE) IEC/EN 61800-3 IEEE 519
	Design and construction	LVD Directive (2006/95/CE) IEC/EN 61800-2 General requirements IEC/EN 61800-5-1 Safety IEC/EN 60146-1-1 Semiconductor converters IEC60068-2-6 - Vibration
	Functional Safety	IEC/EN 61800-5-2(STO) TÜV Rheinland Certified

NOTES [5] On certification process.

SD700 FR | Standard Ratings

POWER RANGE AT 400VAC

FRAME	CODE	Operation Temperature 50°C HEAVY DUTY			Operation Temperature 40°C NORMAL DUTY		
		I(A) Rated	Motor Power (kW) at 400VAC	150% Overload (A)	I(A) Rated	Motor Power (kW) at 400VAC	120% Overload (A)
5	SD7FR0210 5X Y	210	110	315	263	132	315
	SD7FR0250 5X Y	250	132	375	313	160	375
	SD7FR0275 5X Y	275	150	413	344	200	413
6	SD7FR0330 5X Y	330	160	495	413	220	495
	SD7FR0370 5X Y	370	200	555	463	250	555
	SD7FR0460 5X Y	460	250	690	575	315	690
7	SD7FR0580 5X Y	580	315	870	725	400	870
	SD7FR0650 5X Y	650	355	975	813	450	975
	SD7FR0720 5X Y	720	400	1080	900	500	1080
8	SD7FR0840 5X Y	840	450	1260	1050	560	1260
	SD7FR0925 5X Y	925	500	1388	1156	630	1388
	SD7FR0990 5X Y	990	560	1485	1238	710	1485
9	SD7FR1150 5X Y	1150	630	1725	1438	800	1725
	SD7FR1260 5X Y	1260	710	1890	1575	900	1890
	SD7FR1440 5X Y	1440	800	2160	1800	1000	2160
10	SD7FR1580 5X Y	1580	900	2370	1975	1100	2370
	SD7FR1800 5X Y	1800	1000	2700	2250	1200	2700
11	SD7FR2200 5X Y	2200	1200	3300	2750	1500	3300
	SD7FR2500 5X Y	2500	1400	3750	3100	1750	3750

POWER RANGE AT 440VAC

FRAME	CODE	Operation Temperature 50°C HEAVY DUTY				Operation Temperature 40°C NORMAL DUTY			
		I(A) Rated	Motor Power (kW) at 440VAC		150% Overload (A)	I(A) Rated	Motor Power (kW) at 440VAC		120% Sobrecarga (A)
			kW	HP			kW	HP	
5	SD7FR0210 5X Y	191	110	150	286,5	238,7	132	180	286,5
	SD7FR0250 5X Y	227	132	180	340,5	283,7	160	240	340,5
	SD7FR0275 5X Y	250	150	200	375	312,5	200	275	375
6	SD7FR0330 5X Y	300	160	240	450	375	220	300	450
	SD7FR0370 5X Y	336	200	275	504	420	250	340	504
	SD7FR0460 5X Y	418	250	340	627	522,5	315	400	627
7	SD7FR0580 5X Y	527	315	400	790,5	658,7	400	500	790,5
	SD7FR0650 5X Y	591	355	450	886,5	738,7	450	600	886,5
	SD7FR0720 5X Y	654,5	400	500	981,7	818,1	500	650	981,7
8	SD7FR0840 5X Y	764	450	600	1146	955	560	750	1146
	SD7FR0925 5X Y	841	500	650	1261,5	1051,2	630	850	1261,5
	SD7FR0990 5X Y	900	560	750	1350	1125	710	900	1350
9	SD7FR1150 5X Y	1045,5	630	850	1568	1306,8	800	1000	1568
	SD7FR1260 5X Y	1145,5	710	900	1718	1431,8	900	1250	1718
	SD7FR1440 5X Y	1309	800	1000	1963,5	1636,2	1000	1400	1963,5
10	SD7FR1580 5X Y	1436	900	1250	2154	1795	1100	1500	2154
	SD7FR1800 5X Y	1636	1000	1400	2454	2045	1200	1600	2454
11	SD7FR2200 5X Y	2000	1200	1600	3000	2500	1500	1800	3000
	SD7FR2500 5X Y	2300	1400	1900	3450	2800	1750	2350	3450



Standard Ratings

POWER RANGE AT 480VAC

FRAME	CODE	Operation Temperature 50°C HEAVY DUTY			Operation Temperature 40°C NORMAL DUTY		
		I(A) Rated	Motor Power (kW) at 480VAC	150% Overload (A)	I(A) Rated	Motor Power (kW) at 480VAC	120% Sobrecarga (A)
5	SD7FR0210 5X Y	168	110	252	210	132	252
	SD7FR0250 5X Y	200	132	300	250	150	300
	SD7FR0275 5X Y	220	150	330	275	160	330
6	SD7FR0330 5X Y	264	160	396	330	200	396
	SD7FR0370 5X Y	296	200	444	370	250	444
	SD7FR0460 5X Y	368	250	552	460	315	552
7	SD7FR0580 5X Y	464	315	696	580	355	696
	SD7FR0650 5X Y	520	355	780	650	400	780
	SD7FR0720 5X Y	576	400	864	720	450	864
8	SD7FR0840 5X Y	672	450	1008	840	500	1008
	SD7FR0925 5X Y	740	500	1110	925	560	1110
	SD7FR0990 5X Y	792	560	1188	990	630	1188
9	SD7FR1150 5X Y	920	630	1380	1150	710	1380
	SD7FR1260 5X Y	1008	710	1512	1260	800	1512
	SD7FR1440 5X Y	1152	800	1728	1440	900	1728
10	SD7FR1580 5X Y	1264	900	1896	1580	1000	1896
	SD7FR1800 5X Y	1440	1000	2160	1800	1200	2160
11	SD7FR2200 5X Y	1760	1200	2640	2200	1500	2640
	SD7FR2500 5X Y	2000	1400	3000	2500	1750	3000

POWER RANGE AT 525VAC

FRAME	CODE	Operation Temperature 50°C HEAVY DUTY			Operation Temperature 40°C NORMAL DUTY		
		I(A) Rated	Motor Power (kW) at 525VAC	150% Overload (A)	I(A) Rated	Motor Power (kW) at 525VAC	120% Sobrecarga (A)
5	SD7FR0180 7X Y	180	132	270	222	150	270
	SD7FR0205 7X Y	205	150	308	254	185	308
6	SD7FR0270 7X Y	270	200	405	334	250	405
	SD7FR0295 7X Y	295	220	443	360	280	443
	SD7FR0340 7X Y	340	250	510	417	315	510
7	SD7FR0425 7X Y	425	315	638	526	400	638
	SD7FR0470 7X Y	470	355	705	586	450	705
	SD7FR0535 7X Y	535	400	803	666	500	803
8	SD7FR0660 7X Y	660	500	990	824	600	990
	SD7FR0750 7X Y	750	560	1125	936	700	1125
9	SD7FR0845 7X Y	845	630	1268	1052	800	1268
	SD7FR0950 7X Y	950	710	1425	1157	900	1425
10	SD7FR1070 7X Y	1070	800	1605	1337	1000	1605
	SD7FR1205 7X Y	1205	900	1808	1504	1100	1808
	SD7FR1340 7X Y	1340	1000	2010	1672	1250	2010
	SD7FR1605 7X Y	1605	1200	2408	2006	1500	2408
11	SD7FR2005 7X Y	2005	1500	3008	2507	1900	3008



Standard Ratings

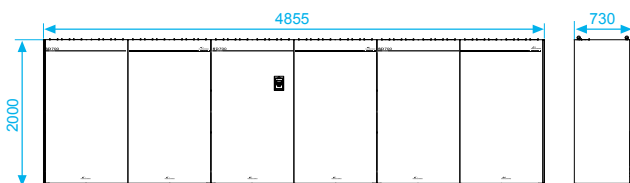
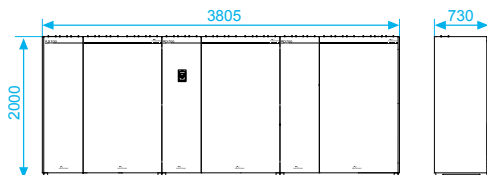
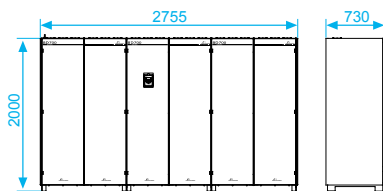
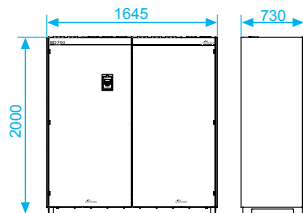
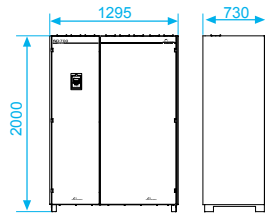
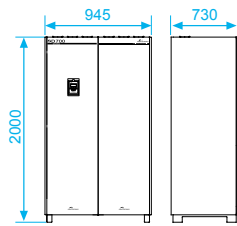
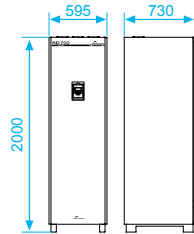
POWER RANGE AT 690VAC

FRAME	CODE	Operation Temperature 50°C HEAVY DUTY			Operation Temperature 40°C NORMAL DUTY		
		I(A) Rated	Motor Power (kW) at 690VAC	150% Overload (A)	I(A) Rated	Motor Power (kW) at 690VAC	120% Sobrecarga (A)
5	SD7FR0130 6X Y	130	110	195	163	132	195
	SD7FR0150 6X Y	150	132	225	188	160	225
	SD7FR0170 6X Y	170	160	255	213	200	255
6	SD7FR0210 6X Y	210	200	315	263	250	315
	SD7FR0260 6X Y	260	250	390	325	315	390
	SD7FR0320 6X Y	320	315	480	400	400	480
7	SD7FR0385 6X Y	385	355	578	481	450	578
	SD7FR0460 6X Y	460	450	690	575	560	690
8	SD7FR0550 6X Y	550	500	825	688	630	825
	SD7FR0660 6X Y	660	630	990	825	800	990
9	SD7FR0750 6X Y	750	710	1125	938	900	1125
	SD7FR0840 6X Y	840	800	1260	1050	1000	1260
	SD7FR0950 6X Y	950	900	1425	1188	1100	1425
10	SD7FR1140 6X Y	1140	1000	1710	1425	1300	1710
	SD7FR1270 6X Y	1270	1200	1905	1588	1600	1905
	SD7FR1420 6X Y	1420	1400	2130	1775	1700	2130
11	SD7FR1500 6X Y	1500	1500	2250	1875	1800	2250
	SD7FR1800 6X Y	1800	1800	2700	2250	2000	2700

SD700 FR

Dimensions

DIMENSIONS AND WEIGHTS



FRAME 5			
INPUT VOLTAGE			WEIGHT (kg)
380-480Vac	525Vac	690Vac	
SD7FR0210 5X Y	SD7FR0185 7X Y	SD7FR0130 6X Y	350
SD7FR0250 5X Y	SD7FR0205 7X Y	SD7FR0150 6X Y	
SD7FR0275 5X Y		SD7FR0170 6X Y	

FRAME 6			
INPUT VOLTAGE			WEIGHT (kg)
380-480Vac	525Vac	690Vac	
SD7FR0330 5X Y	SD7FR0270 7X Y	SD7FR0210 6X Y	700
SD7FR0370 5X Y	SD7FR0295 7X Y	SD7FR0260 6X Y	
SD7FR0460 5X Y	SD7FR0340 7X Y	SD7FR0320 6X Y	

FRAME 7			
INPUT VOLTAGE			WEIGHT (kg)
380-480Vac	525Vac	690Vac	
SD7FR0580 5X Y	SD7FR0425 7X Y	SD7FR0385 6X Y	1000
SD7FR0650 5X Y	SD7FR0470 7X Y	SD7FR0460 6X Y	
SD7FR0720 5X Y	SD7FR0535 7X Y		

FRAME 8			
INPUT VOLTAGE			WEIGHT (kg)
380-480Vac	525Vac	690Vac	
SD7FR0840 5X Y	SD7FR0660 7X Y	SD7FR0550 6X Y	1200
SD7FR0925 5X Y	SD7FR0750 7X Y	SD7FR0660 6X Y	
SD7FR0990 5X Y			

FRAME 9			
INPUT VOLTAGE			WEIGHT (kg)
380-480Vac	525Vac	690Vac	
SD7FR1150 5X Y	SD7FR0845 7X Y	SD7FR0750 6X Y	2100
SD7FR1260 5X Y	SD7FR0950 7X Y	SD7FR0840 6X Y	
SD7FR1440 5X Y		SD7FR0950 6X Y	

FRAME 10			
INPUT VOLTAGE			WEIGHT (kg)
380-480Vac	525Vac	690Vac	
SD7FR1580 5X Y	SD7FR1070 7X Y	SD7FR1140 6X Y	3000
SD7FR1800 5X Y	SD7FR1205 7X Y	SD7FR1270 6X Y	
	SD7FR1340 7X Y	SD7FR1420 6X Y	
	SD7FR1605 7X Y		

FRAME 11			
INPUT VOLTAGE			WEIGHT (kg)
380-480Vac	525Vac	690Vac	
SD7FR2200 5X Y	SD7FR2005 7X Y	SD7FR1500 6X Y	3600
SD7FR2500 5X Y		SD7FR1800 6X Y	