VARIABLE SPEED DRIVE

SD700

SD700FR Series

Regenerative

POWER ELECTRONICS®

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 and low harmonics 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

- **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-800V/µs (unshielded cable up to 300m)
- Conformally coated electronics with military and aerospace technology

water
mining
oil & gas
metal-paper
OEM´s
energy

iCOOL

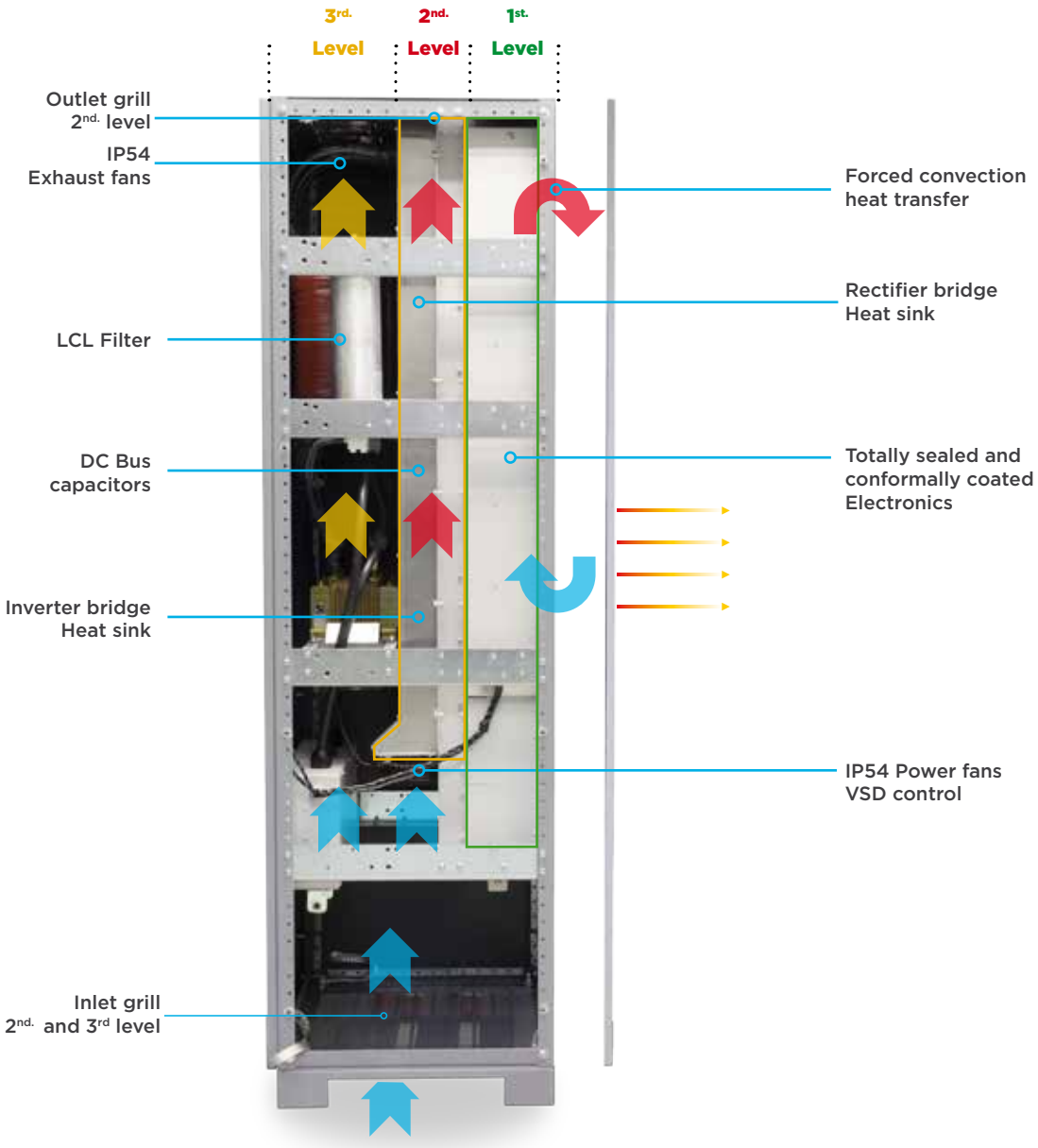
PROTECTION DEGREE
IP54

FFA
FRONTAL ACCESS

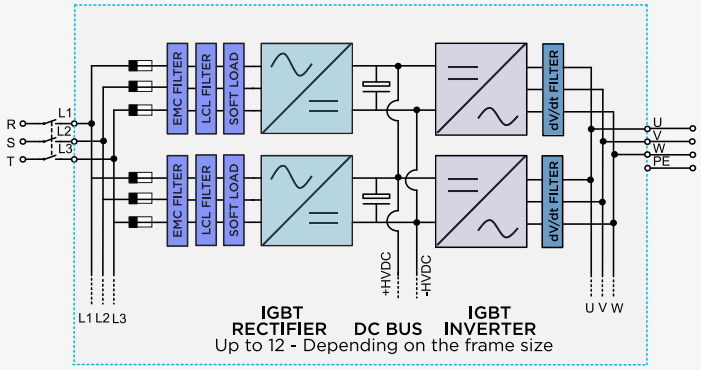
OPERATION TEMPERATURE
+50°C

CONFORMAL COATING

Three independent levels offer maximum protection and efficient cooling features



The PCB coating protects the micro lead components that are vulnerable to dust, moisture, pollution (PD3) and corrosive gasses 3C3 build up, which can produce conductive paths that can result in pins short circuiting.



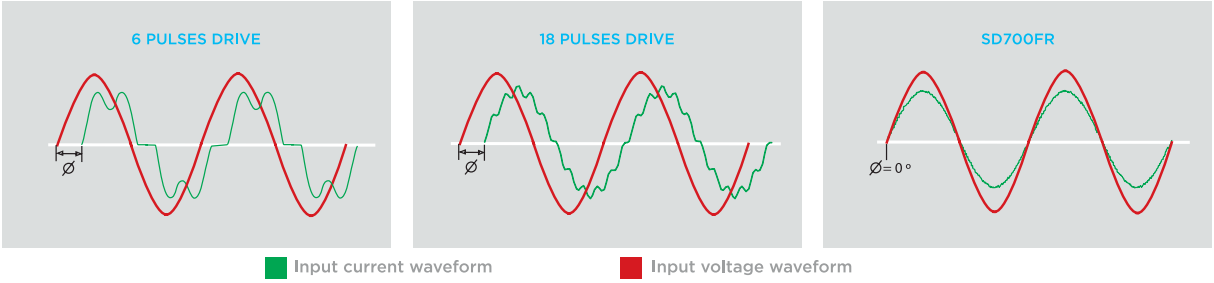
UNIFIED ELECTRONIC BOARDS PERMIT NOT ONLY AN EASY AND QUICK MAINTENANCE BUT ALSO A REDUCED AMOUNT OF SPARE PARTS WORLDWIDE

LOW HARMONICS

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The traditional thyristor-diode rectifier has been replaced by a controlled Isolated Gate Bipolar Transistor (IGBT) bridge.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 CosΦ = 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!



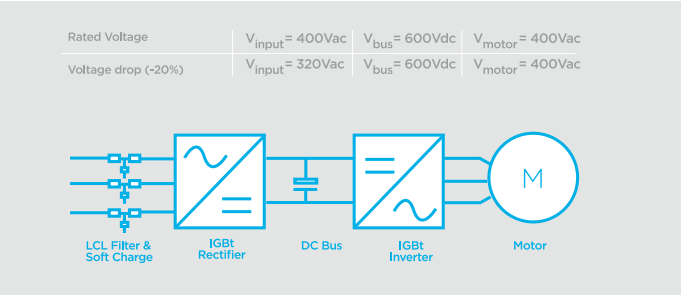
4 QUADRANT

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.

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.

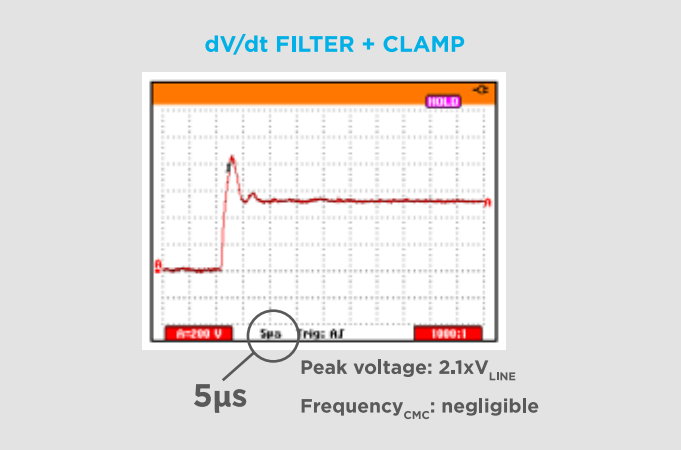


MAX. MOTOR CARE

Maximum motor care

SD700 includes built-in as standard dV/dt filter that reduces the dV/dt value to 500V/µs-800V/µs depending on the drive size and rated voltage, minimizing the voltage peaks at the motor winding. Additionally SD700 has a unique CLAMP electronic system that smartly absorbs high frequency currents caused by the reflection phenomena in long motor cables. Consequently SD700 low voltage drive portfolio can be installed following Power Electronics recommendations with:

- greater cable distances (unshielded cable up to 300m)
- standard unshielded cable
- non isolated bearings
- no special motor insulation



SOFTWARE TOOLS

PowerCOMMS. The PowerCOMMS tool offers real performance information about motor and drive status.

POWERFUL CONTROL

Powerful and Accurate control Power Electronics' success is measured by our customer's satisfaction so the motor control systems developed by Power Electronics have been designed to meet the most demanding features in any sector.

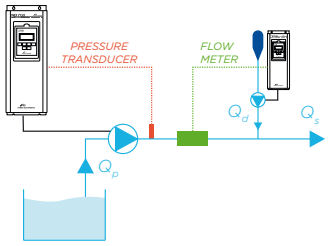
PowerPLC. The PowerPLC tool will enhance SD700 performance implementing multiple functions without additional hardware.

PUMPING

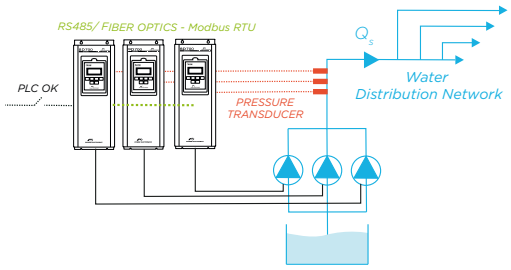
VENTILATION

- Accurate direct and reverse action of the PID control regulation of pressure, flow, level.
- Sleep and wake up functionality for extra energy saving depending on pressure and flow.
- Water Hammer control to prevent catastrophic breakdowns.
- Direct programming in engineering units (l/s, m^3/s, %, °C, ...).
- Operation in manual or automatic mode is up to you.
- Several Pump alternation modes for homogeneous ageing.
- Visualization of working time per pump and number of starts.
- Under-pressure and Over-pressure compensation.
- Head or pressure compensation depending on flow rate.
- Pipe fill function.
- Out of service Motor monitoring.
- Pulse measurement of the flow.
- Pump safety protections: cavitation with reset activation time, minimum pressure detection, over-pressure control, zero-flow detection...

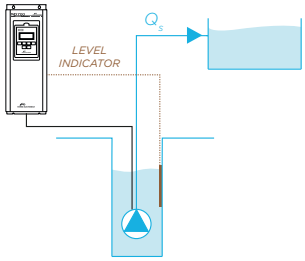
PRESSURE & FLOW PID CONTROL



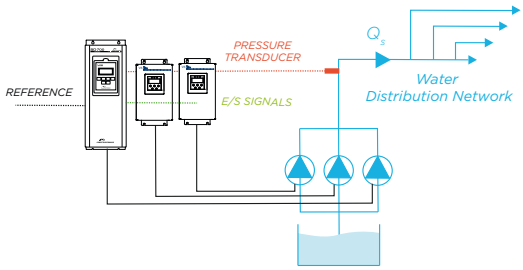
MULTI-MASTER CONTROL



LEVEL PID CONTROL



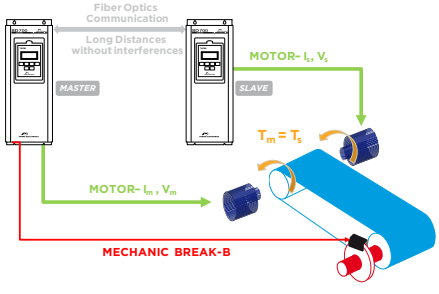
MULTIPUMP CONTROL WITH V5 SOFT STARTERS



MOTION

- Precise and high starting torque features dedicated to loaded lifting systems.
- PMC-OLTQ (Power Motor Control-Open Loop Torque Control) over fibre optics communications provides unique master-slave performance in the most demanding applications, and guaranties a perfect torque distribution.
- Fast commissioning and invariable control response due to motor or belt parameters variation.
- Thanks to the MBC (Mechanical Brake Control), the Pre-Magnetization and Delay off IGBT, the loaded process will have a smooth start and stop.
- PMC factory settings and motor nameplate parameters ensure perfect performance without enabling the auto tuning function during commissioning.

PMC-OLTQ CONTROL



PERFECT TORQUE DISTRIBUTION WITHOUT ENCODER

ENGINEERING AND CONSULTING

Customised solutions

Power Electronics' engineering department offers a wide variety of tailor made solution to comply with your specific requirements. Factory tested solutions that provide flexibility and reliability.

Customised input and output wiring:
- Top and bottom connections
- Size and number of conductors
- EMC requirements

Disconnection and Protection:
- Fuses
- On-load disconnectors
- Circuit breakers
- Isolation monitoring
- Earthing switch
- Mechanical interlocks

Documentation:
- Dimensions and electrical drawings
- ITP reports
- FAT - Factory Acceptance Test
- ...

Customised control and push buttons:
- Selectors and pushbuttons
- Customized user terminal strip
- PTC and PT100 relays
- Redundant external Power Supply (UPS)
- ...

Cabinet features:
- Transport and elevation plinths
- Painting requirements
- Special cooling system (altitude, humidity, dust...)
- Structural design and test
- ...

ACCESSORIES

CODE	ACCESSORIES DESCRIPTION
SD7PD	Profibus Communication Board
SD7ET	Ethernet Communication Board
SD7DN	DeviceNet Communication Board
SD7CO	CAN Open Communication Board
(*)	N2 Metasys Communication Gateway
SD7EC	Encoder Board
SD7IO	Inputs / Outputs Expansion Board Additional 4DI, 5DO, 1AI and 1 AO
SD7FO	Fiber Optics board
SD7STO	Safe Torque Off (STO) board. Allows to implement in the drive the safe torque off function according to IEC/EN 61800-5-2

CODE	ACCESSORIES DESCRIPTION
V11	Display Extender Kit (3 meters)
V12	Display Extender Kit (5 meters)
SD7FRES05I	External 24Vdc Power Supply – Frame 5 – Interior Assembly
SD7FRES06I	External 24Vdc Power Supply – Frames 6, 7 and 8 – Interior Assembly
SD7FRES09I	External 24Vdc Power Supply – Frame 9 – Interior Assembly
SD7FRES10I	External 24Vdc Power Supply – Frames 10 and 11 – Interior Assembly

* Consult availability

TECHNICAL CHARACTERISTICS

INPUT	Power range	110kW - 2000 kW [1]
	Voltage range	380-480Vac, 525Vac, 690Vac , 3 phases (±10%)
	Input frequency	50Hz/60Hz ± 6%
	Input rectifier technology	IGBT (2.8KHz)
	DPF=cos ø / Power factor	0.90 leading ...1... 0.90 lagging (adjustable) / > 0.98
	EMC input filter	Second environment (Industrial): (C3 Standard) First environment (Domestic): C2 (Optional). C1 consult Power Electronics
	Current THDi (%) / Harmonics filter	< 3% - 5% [2] / LCL and Active Front End Control
	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 rated current and rated voltage)	≥ 97%
	Switching frequency	4 to 8kHz - PEWave
	Output dV/dt filter	500 to 800V/µs
	Output cable length [4]	USC 300m, SC 150m
ENVIRONMENTAL CONDITIONS	Operation temp. / Storage temp.	-20°C to +50°C / -40°C to +70°C
	Altitude/Power altitude derating [1]	1000m / >1000m, 1% PN(kW) per 100m; 4000m maximum
	Ambient humidity	<95%, non-condensing
	Degree of protection	IP20, IP54
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)	Two differential encoders 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. 1 Analogue Output: Programmable outputs in voltage / current.
	External power supply (optional)	24V External Power Supply, Fault Relay integrated
COMMUNICATION	Standard protocol	Modbus-RTU
	Optional protocol	Profibus-DP, DeviceNet, Ethernet (Modbus TCP), Ethernet IP, CAN Open, N2 Metasys Gateway
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, IEC/EN 61800-5-1, IEC/EN 60146-1-1, IEC60068-2-6, IEC/EN 61800-5-2(STO) Tüv Rheinland Certified

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.
[5] On certification process.

CONFIGURATION TABLE

SD700 Series	Model		Output Current[1]		Input Voltage		Degree of protection		Cabinet plinths[2]		EMC Filter		Floating Earth		Input Frequency	
SD7	FR	SD700 FR Regenerative	210	210A	5	380-480Vac	2	IP20	-	Standard	-	Second environment	-	Without Floating Earth	-	50Hz
			330	330A	7	525Vac	5	IP54	20	Total height 2000mm	F	First environment[2]	T	With Floating Earth	6	60Hz [3]
			...	...	6	690Vac			22	Total height 2200mm	M	Optional IT filter				
			2500	2500A												

NOTES

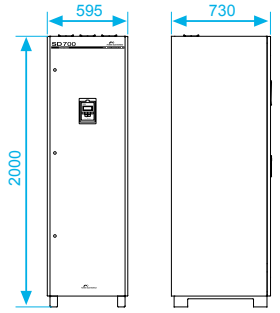
[1] Verify the rated current of the motor nameplate to guarantee the compatibility with the selected drive.
[2] Floating earth drive not available with first environment filter.
[3] Consult availability.
For more ordering info, contact our sales representative.

STANDARD RATINGS

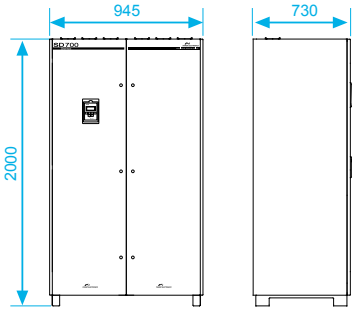
400Vac							
FRAME	CODE	Operation Temperature 50°C HEAVY DUTY			Operation Temperature 40°C NORMAL DUTY		
		I(A) Rated	Motor Power (kW) at 400VAC	150% Overload (A)	I(A) Rated	Motor Power (kW) at 400VAC	120% Overload (A)
5	SD7FR0210 5	210	110	315	263	132	315
	SD7FR0250 5	250	132	375	313	160	375
	SD7FR0275 5	275	150	413	344	200	413
6	SD7FR0330 5	330	160	495	413	220	495
	SD7FR0370 5	370	200	555	463	250	555
	SD7FR0460 5	460	250	690	575	315	690
7	SD7FR0580 5	580	315	870	725	400	870
	SD7FR0650 5	650	355	975	813	450	975
	SD7FR0720 5	720	400	1080	900	500	1080
8	SD7FR0840 5	840	450	1260	1050	560	1260
	SD7FR0925 5	925	500	1388	1156	630	1388
	SD7FR0990 5	990	560	1485	1238	710	1485
Higher power drives available. Consult sales representative.							

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% Overload (A)
5	SD7FR0180 7	180	132	270	222	150	270
	SD7FR0205 7	205	150	308	254	185	308
6	SD7FR0270 7	270	200	405	334	250	405
	SD7FR0295 7	295	220	443	360	280	443
	SD7FR0340 7	340	250	510	417	315	510
7	SD7FR0425 7	425	315	638	526	400	638
	SD7FR0470 7	470	355	705	586	450	705
	SD7FR0535 7	535	400	803	666	500	803
8	SD7FR0660 7	660	500	990	824	600	990
	SD7FR0750 7	750	560	1125	936	700	1125
Higher power drives available. Consult sales representative.							

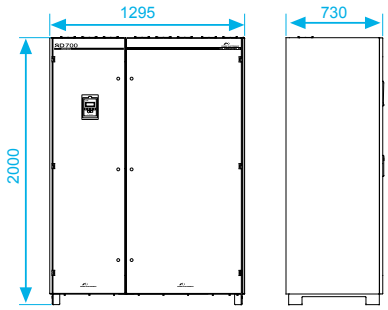
690Vac							
FRAME	CODE	Operation Temperature 50°C HEAVY DUTY			Operation Temperature 40°C NORMAL DUTY		
		I(A) Rated	Motor Power (kW) at 690VAC	150% Overload (A)	I(A) Rated	Motor Power (kW) at 690VAC	120% Overload (A)
5	SD7FR0130 6	130	110	195	163	132	195
	SD7FR0150 6	150	132	225	188	160	225
	SD7FR0170 6	170	160	255	213	200	255
6	SD7FR0210 6	210	200	315	263	250	315
	SD7FR0260 6	260	250	390	325	315	390
	SD7FR0320 6	320	315	480	400	400	480
7	SD7FR0385 6	385	355	578	481	450	578
	SD7FR0460 6	460	450	690	575	560	690
8	SD7FR0550 6	550	500	825	688	630	825
	SD7FR0660 6	660	630	990	825	800	990
Higher power drives available. Consult sales representative.							



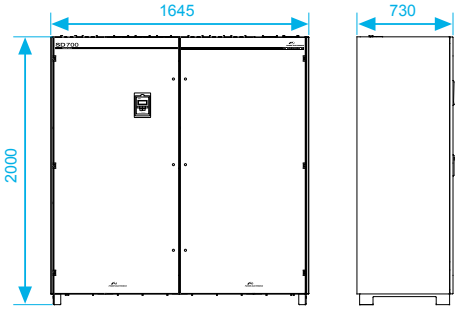
FRAME	WEIGHT (kg)
5	350



FRAME	WEIGHT (kg)
6	700



FRAME	WEIGHT (kg)
7	1000



FRAME	WEIGHT (kg)
8	1200

POWER ELECTRONICS®

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