

SIEMENS

Ingenuity for life



Industry Cabinet

The standardized solution using SINAMICS technology.

Powered by SINAMICS

siemens.com.br/drives

Industry Cabinet

The specialist to meet market demands

Solutions ready to operate with Siemens quality.

Siemens is a world leader in the supply of frequency inverters, as well as other innovative and sustainable products and solutions for the industry. Industrial software, market experience, and services based on technology and quality are the guidelines used to increase the productivity, efficiency, and flexibility of our customers.

Industry Cabinet products are panel-mounted frequency inverters that offer customers reliability, robustness, and all the quality of Siemens products, in addition to serving various applications with flexible and adaptable solutions for the market. With a wide range of power and options, the Industry Cabinets offer high performance, easy maintenance, and competitive price.

Using the frequency inverters of the SINAMICS family, Industry Cabinets is the solution designed to address the diverse demands of the electrical drive systems market.

Industry Cabinets can be easily connected to SIMATIC controllers and integrated quickly and easily into the automation environment. In addition, SINAMICS inverters are part fully integrated with TIA Portal.

Regardless of power and application, Industry Cabinets are based on the same software platform. This development strategy offers a standard operation and enables the use of the same commissioning tool, minimizing training costs.







The integrated SIEMENS solution can offer more:

- **Consistency:** To simplify the engineering and commissioning of the plant as well as the easy integration in automation solutions for most processes.
- **One-stop-shop:** A reliable partner with a complete portfolio for the entire process and life cycle - from the initial idea to after-sales service.
- **Security:** A comprehensive range of protective components for operator safety.
- **Reliability:** A reliable partner that works with customers to develop lasting solutions that meet the highest quality standards.
- **Efficiency:** Smart Consumption means increased plant availability and maximum efficiency in power distribution.
- **Flexibility:** End-to-end consistency and fully integrated modular power design for any future expansion and adaptation needed.
- **Advanced technology:** Reliable power distribution especially for critical applications using the most advanced technology.

Functions that facilitate the operation and maintenance of industrial applications

Handling	<ul style="list-style-type: none"> • Simple integration with automation (Startdrive, TIA Portal) • User integration in PCS 7 process control system, operation in use
Robustness	<ul style="list-style-type: none"> • Reliable operation at room temperature up to 55°C • Able to operate in harsh environments - components and coatings protects against corrosive gases
Energy efficiency	<ul style="list-style-type: none"> • Efficiency greater than 98 % • Reduction of flow to adapt to the actual load • Hibernation mode • Auto Adjust to the power and rotation required for the load - Up to three external speed references / setpoints may be connected.

Industry Cabinet Standard functions

<p>Integrated Communication Different communication options</p>		<p>Easy integration in automation and process control systems with multiple communication protocol options.</p>
<p>Closed Loop Control For adjustment of pressure, temperature, and air quality with up to three ranges (average, maximum and minimum value).</p>		<p>Optimization of the energy used in the drive by equalizing the process fluctuations.</p>
<p>Torque monitoring Axis locked, dry operation and leak detection</p>		<p>Protection against damage of the driven equipment avoiding additional costs of machine downtime.</p>
<p>Basic logic functions PID control, ramp function, skip critical frequency, signal logic operations, manual control and protection functions.</p>		<p>Process optimization and reduction of engineering time.</p>



Protection functions and software	Description
Setpoint Specification	The setpoint can be inserted internally and externally. It is applied internally as a fixed setpoint, motorized potentiometer setpoint, or adjustment setpoint and externally via the communication interface or an analog input in the customer terminal block. The internal fixed setpoint and the motorized potentiometer setpoint can be switched or adjusted using control commands from any interface.
Motor Identification	The automatic motor identification function makes commissioning faster and easier and optimizes the closed loop control of the drive.
Ramp-function generator	An advanced ramp-function generator with separate ramp time settings, together with adjustable rounding times in the lower and upper speed ranges, allows the drive to be smoothly accelerated and braked. As a consequence, this prevents the drive from being overloaded and reduces stress on mechanical components. The acceleration and deceleration ramps can be parameterized separately at a quick stop.
Controller $V_{dc\ max}$	The Vdc max controller automatically prevents overvoltages on the CC link if the deceleration ramp is too short, for example. This can also extend the set deceleration time.
Automatic restart	Auto restart turns on the frequency inverter again when power is restored after a power failure and accelerates to the current speed setpoint.
Flying restart / Start-up	The "Flying restart" function allows the inverter to be switched to a motor that is still rotating.
Technology controller	Technology controllers (in the form of PID controllers) can be used to implement simple closed loop control functions. A PID controller controls motor speed as a process controller for temperature, pressure, air quality, or level control. Three other PID controllers are freely programmable. P, I, or D components can be disabled.
Free function blocks	Using the free function programmable blocks, it is easy to implement logical and arithmetic functions to control the Industry Cabinet. The blocks can be programmed using an operator panel or the STARTER commissioning tool.
Over temperature detection for motor protection (I²t calculation)	A motor model stored in the inverter software calculates the motor temperature based on the current speed and load. More accurate temperature detection, which also takes into account the influence of ambient temperature, is possible by direct temperature sensing using KTY sensors in the motor winding.
Essential service mode	Special operating mode of the inverter that increases the availability of the drive system in the event of a fire.
Bypass¹	When the setpoint is reached or when a failure occurs, there is a change so that the operation is done directly on the network.

1) This function requires an additional external circuit.

Industry Cabinet G Series - G120BR

The ideal panel for pumps, fans and compressors

G120BR drives are frequency inverters focused on quadratic torque applications (pumps, fans and compressors), being able to increase energy efficiency, presenting the necessary reliability to play an important role in the industrial process. With its integrated functions, the G120BR adapts perfectly to different applications, facilitating the completely engineering process. Its robust design was developed for use in different industrial environments, meeting the needs of the market.

The G120BR frequency inverters are ideal solutions to address specific demands of drive systems, such as fans that supply and extract air in HVAC systems, pumps for heating/cooling circuits and compressors for cooling machines. In addition, they provide the ideal response to meet special industry requirements.


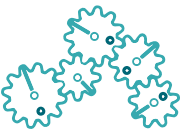

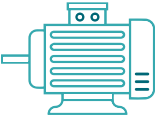


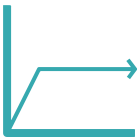
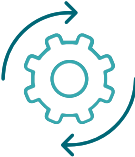


CU230-2 control unit with communication possibilities (PROFINET, PROFIBUS DP, EtherNET / IP, HVAC, CANopen)



IOP-2 operator panel with color display and different functions available.

Specific functions of G Series - G120BR inverters

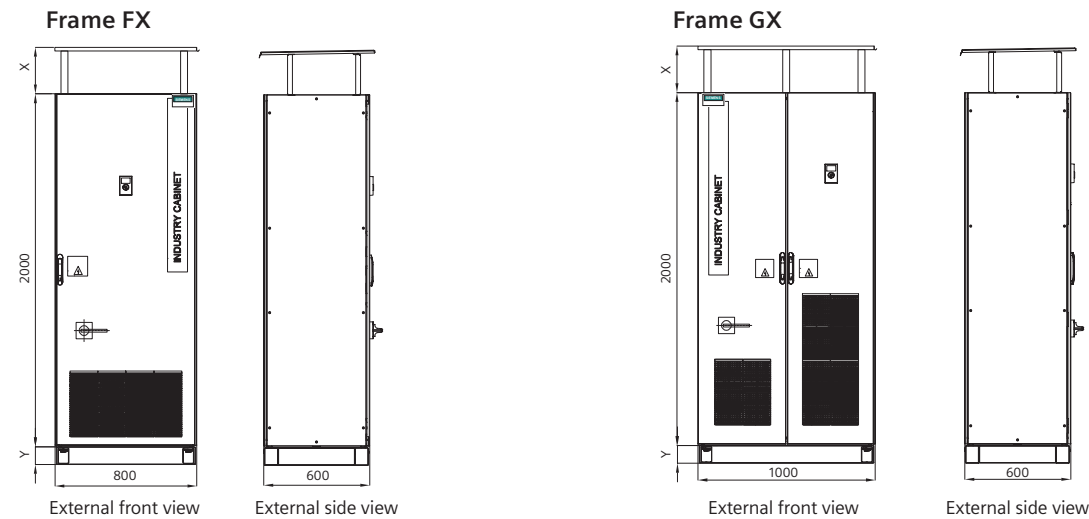
	Hibernation mode	Startup or shutdown of the drive when the relevant value drops below an external setpoint or the internal PID controller setpoint.
	Cascade connection	Load dependent connection and disconnection, of a maximum of three motors connected in cascade, to provide a constant output power.
	Multi-zone control	Closed loop control of a system with up to 3 sensors for pressure or temperature, or closed loop control of two independent systems, each with one sensor.
	Motor blocking protection	A blocked motor is detected and protected against thermal overloading by a fault trip.
	Vdc_min control	In the event of a power supply voltage drop, the kinetic energy of the rotating drive is used to buffer the DC link in order to avoid under voltage alarms. The inverter remains operational as long as the drive can provide regenerative energy as a result of its motion and the DC link voltage does not drop below the shutdown threshold. When the line supply recovers within this time, the drive is again bumplessly accelerated up to its setpoint speed.
	Motor temperature evaluation	Motor protection by evaluating a KTY, PTC or Pt1000 temperature sensor, or bimetal NC contact. When a KTY sensor is connected, the limit values may be set for alarm or failure. When a PTC thermistor is connected, the system reaction to triggering of the thermistor (alarm or trip) can be defined.
	Ramp-function	An advanced ramp-function generator with separately adjustable ramp-up and ramp-down times, together with adjustable rounding times in the lower and upper speed ranges, allows the drive to be smoothly accelerated and braked. As a consequence, this prevents the drive from being overloaded and reduces stress on mechanical components. The acceleration and deceleration ramps can be parameterized separately for a quick stop.
	Flying restart / Start-up	The "Flying restart" function allows the inverter to be switched to a motor that is still turning.

Industry Cabinet G Series - G120BR

ID	Rated Current			Rated Power		Low Overload Current		
	In (380 V ±10 %)	In (440 V ±10 %)	In (480 V ±10 %)	kW	hp	IL (380 V ±10 %)	IL (440 V ±10 %)	IL (480 V ±10 %)
G120BR-A0075-SB0	145	145	145	75	100	145	145	145
G120BR-A0090-SB0	178	178	178	90	125	178	178	178
G120BR-A0110-SB0	205	205	205	110	150	205	205	205
G120BR-A0132-SB0	250	250	250	132	175	250	250	250
G120BR-A0160-SB0	302	302	302	160	200	302	302	302
G120BR-A0200-SB0	370	370	370	200	250	370	370	370
G120BR-A0250-SB0	477	477	477	250	300	477	477	477
G120BR-A0315-SB0	585	567	490	315	400	570	552	477
G120BR-A0355-SB0	655	631	528	355	450	640	617	515
G120BR-A0400-SB0	735	710	603	400	500	720	696	590
G120BR-A0450-SB0	870	838	701	450	600	820	790	663
G120BR-A0500-SB0	910	877	739	500	650	890	858	724
G120BR-A0560-SB0	1021	988	847	560	750	1000	968	830

ID	Rated Current			Rated Power		Low Overload Current		
	In (600 V ±10 %)	In (660 V ±10 %)	In (690 V ±10 %)	kW	hp	IL (600 V ±10 %)	IL (660 V ±10 %)	IL (690 V ±10 %)
G120BR-B0075-SB0	80	80	80	75	100	80	80	80
G120BR-B0090-SB0	100	100	100	90	125	100	100	100
G120BR-B0110-SB0	115	115	115	110	150	115	115	115
G120BR-B0132-SB0	142	142	142	132	175	142	142	142
G120BR-B0160-SB0	171	171	171	160	200	171	171	171
G120BR-B0200-SB0	208	208	208	200	250	208	208	208
G120BR-B0250-SB0	250	250	250	250	300	250	250	250
G120BR-B0315-SB0	353	344	340	315	400	343	334	330
G120BR-B0355-SB0	396	394	393	355	450	388	386	385
G120BR-B0400-SB0	441	434	430	400	500	431	424	420
G120BR-B0450-SB0	497	486	480	450	600	487	476	470
G120BR-B0500-SB0	554	542	535	500	650	538	527	520
G120BR-B0560-SB0	623	604	595	560	750	607	589	580
G120BR-B0630-SB0	693	674	665	630	850	677	659	650

Dimensional G Series - G120BR



Note: Front and side view considering IP21 degree of protection

Industry Cabinet G Series - G120BR						
ID	Frame	Weight	Max. cables length (m)		Dissipated Power (kW)	Cooling air requirement
		(kg) IP20 without options	Shielded cables	Unshielded cables	380 V/40 °C without Options	m ³ /s
G120BR-A0075-SB0	FX	165	300	450	1,91	0,16
G120BR-A0090-SB0	FX	165	300	450	2,46	0,16
G120BR-A0110-SB0	FX	165	300	450	2,28	0,16
G120BR-A0132-SB0	FX	165	300	450	2,98	0,16
G120BR-A0160-SB0	GX	370	300	450	3,67	0,21
G120BR-A0200-SB0	GX	380	300	450	4,62	0,21
G120BR-A0250-SB0	GX	400	300	450	6,18	0,21
G120BR-A0315-SB0	HX	500	150	200	7,35	0,6
G120BR-A0355-SB0	HX	500	150	200	8,28	0,6
G120BR-A0400-SB0	HX	530	150	200	9,1	0,6
G120BR-A0450-SB0	JX	655	150	200	11,09	0,7
G120BR-A0500-SB0	JX	676	150	200	11,6	0,7
G120BR-A0560-SB0	JX	681	150	200	13,34	0,7

ID	Frame	Weight	Max. cables length (m)		Dissipated Power (kW)	Cooling air requirement
		(kg) IP20 without options	Shielded cables	Unshielded cables	380 V/40 °C without Options	m ³ /s
G120BR-B0075-SB0	FX	165	300	450	1,37	0,16
G120BR-B0090-SB0	FX	165	300	450	1,74	0,16
G120BR-B0110-SB0	FX	165	300	450	1,95	0,16
G120BR-B0132-SB0	FX	165	300	450	2,48	0,16
G120BR-B0160-SB0	GX	370	300	450	2,94	0,21
G120BR-B0200-SB0	GX	380	300	450	3,7	0,21
G120BR-B0250-SB0	GX	400	300	450	4,64	0,21
G120BR-B0315-SB0	HX	515	150	200	5,83	0,6
G120BR-B0355-SB0	HX	522	150	200	6,66	0,6
G120BR-B0400-SB0	HX	522	150	200	7,42	0,6
G120BR-B0450-SB0	HX	535	150	200	8,25	0,6
G120BR-B0500-SB0	JX	654	150	200	8,68	0,7
G120BR-B0560-SB0	JX	697	150	200	9,46	0,7
G120BR-B0630-SB0	JX	716	150	200	10,68	0,7

Dimensional G Series - G120BR

Frame HX

External front view External side view

Frame JX

External front view External side view

Optional	Y-Dimension
M06	100mm
M07	200mm

Optional	X-Dimension
M21	300mm
M23	400mm
M43	400mm
M54	400mm

Note: Front and side view considering IP21 degree of protection

General Technical Data

Electrical Specifications	
Input voltage and Rated Power	380 ... 480 V 3 AC $\pm 10\%$, 75 ... 560 kW 500 ... 690 V 3 AC $\pm 10\%$, 315 ... 630 kW
Input Frequencies	47 ... 63 Hz
Output Frequencies	0 ... 150 Hz
Efficiency	>98 %
Overvoltage Category	III under Standard IEC 61800-5-1
Brake operation	DC Link / Dynamic Braking with optional Braking Module
Mechanical Specifications	
Degree of protection	Standard: IP20 (with IP21 / IP23 / IP43 / IP54 options)
Panel System	Panels compatible with the industrial standard
Cable entry	Standard from below (options for connections from above)
Paint Finish	RAL 7035
Cooling Method	Forced-Air
Base	Optional with 100 mm or 200 mm
Control Specifications	
Control Methods	Vector control with and without sensor or V/f control
Fixed Speed	15 fixed speeds plus 1 minimum speed, programmable
Skipped speed	4, parameterizable
Setpoint Resolution of the control module	0.01 Hz 12 bit analog
Communication Protocols	<ul style="list-style-type: none"> • Standard CU230P-2 DII PROFIBUS • CU230P-2 PN \rightarrow PROFINET, EtherNet/IP • CU230P-2 HVAC \rightarrow USS, Modbus RTU, BACnet MS/TP, FLN P1
Interfaces	
Digital Inputs	6 isolated inputs Current consumption 5.5 mA
Digital Outputs	3 relays 2 reversible contacts and <ul style="list-style-type: none"> • 250 V AC, 2 A (inductive load) • 30 V DC, 5 A (resistive load) 1 contato aberto <ul style="list-style-type: none"> • 30 V DC, 0.5 A (resistive load)
Analog Inputs	2 differential inputs <ul style="list-style-type: none"> • -10 ... +10 V, 0/4 ... 20 mA, resolution 12-bits • The differential analog inputs can be configured as additional digital inputs. 1 non-isolated input <ul style="list-style-type: none"> • Configurable through DIP switch between 0/4 ... 20 mA and PT1000 temperature sensors (resolution 12-bits) 1 non-isolated input <ul style="list-style-type: none"> • Temperature sensor type PT1000 (resolution 12-bits)
Analog Outputs	2 Analog Outputs <ul style="list-style-type: none"> • Configurable via parameter between 0 ... 10 V ou 0/4 ... 20 mA
PTC / KTY Interface	1 input for temperature sensor compatible with sensors: PTC, PT1000, KTY and bimetallic (accuracy $\pm 5\text{ }^\circ\text{C}$)
HMI-Human Machine Interface	Intelligent Operator Panel IOP-2 (on panel door)
PC Interface	Via USB input

Optionals	Code
Control units (Standard: CU230-P DP - PROFIBUS)	
Control unit CU230P-2 PN (PROFINET, EtherNet/IP)	K96
Control unit CU230P-2 HVAC (USS, Modbus RTU, BACnet MS/TP, FLN P1)	K98
Input options	
RFI Filter Category C2	L00
Line Harmonic Filter Compact (LFH compact)	L01
Main contactor (input current ≤ 800 A)	L13
Main switch incl. fuses	L26
Motor protection and safety functions	
Emergency OFF pushbutton on cabinet door	L45
Emergency OFF Category 0, 230 V AC or 24 V DC	L57
Emergency STOP Category 1, 24V AC	L60
PTC thermistor input (alarm)	L83
PTC thermistor input (failure)	L84
Input for up to 6 PT-100 sensors	L86
Emergency button provided on the terminal to control the upstream	L49
Safety Integrated	
Safety Function Category 0 (STO)	K83
Safety Function Category 1 (SS1)	K84
Increased degree of protection (Standard: IP20)	
Degree of Protection IP21	M21
Degree of Protection IP23	M23
Degree of Protection IP43	M43
Degree of Protection IP54	M54
Mechanical options	
Base 100 mm high, RAL 7022	M06
Cable compartment 200mm high, RAL 7035	M07
Other options	
Output reactor	L08
External power supply 120V AC	K69
Control voltage 230V AC derived from the main panel voltage	K74
Connection for external auxiliary equipment	L19
Cabinet lighting with service socket	L50
Cabinet anti-condensation heating	L55
Braking module 50 kW (P20 power: 200 kW)	L62
Label for system identification, 40 x 180 mm	Y33
Documentation and languages (Standard: Portuguese)	
Documentation (circuit diagram, terminal diagram, layout diagram) in DXF format	D02
Documentation language: English/Spanish	D60
Rating plate data in English/Spanish	T60
Device acceptance inspection in presence of customer	
Visual acceptance inspection	F03
Function test with no motor connected	F71
Function test with test bay motor under no-load conditions	F75
Insulation Test	F77
Customer-specific acceptance inspection	F97
Device acceptance inspection without presence of customer	
Function test with no motor connected	F72
Function test with test bay motor under no-load conditions	F74
Insulation Test	F76
Extended warranty for defects	
Extended warranty for defects: 18 months from start of operation or 24 months after delivery	Q80
Extended warranty for defects: 24 months from start of operation or 30 months after delivery	Q81
Extended warranty for defects: 30 months from start of operation or 36 months after delivery	Q82
Extended warranty for defects: 36 months from start of operation or 42 months after delivery	Q83
Extended warranty for defects: 42 months from start of operation or 48 months after delivery	Q84
Extended warranty for defects: 48 months from start of operation or 54 months after delivery	Q85

Industry Cabinet G Series - G150BR

The ideal panel for all applications

The Industry Cabinet G Series - G150BR is Siemens' panel solution for various segments and comprehensive power range of 6 and 12 pulses. Not only for applications with quadratic torque characteristics - e.g. pumps, fans, compressors, but also for constant torque applications such as extruders, mixers and crushers.

The wide range of options and power provides the G150BR with the ability to meet the needs of the most varied applications regardless of complexity or specific requirements. The product is also available in versions capable of mitigating the harmonic effects of the network, providing power quality to the system as well as dynamic braking requirements.

The Industry Cabinet G150BR presents the DRIVE-CLiQ concept that enables the modularity of the additional control components of the frequency inverter. This makes that the field interferences do not cause damage in the equipment operation, galvanically protecting the power and control module. This concept also helps in the organization and arrangement of the panel components, which provides a more compact product.

Energy saving is one of the main reasons for the use of frequency inverters in the most diverse applications. The G150BR drive includes firmware functions to maximize energy savings and features specific functions to optimize the operation of different applications.






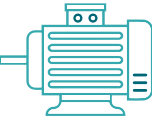




CONTROL UNIT CU320-2 WITH PROFIBUS or PROFINET interface. The interface also contains digital and analog inputs and outputs. Extension cards can be installed enabling communication via CANopen or EtherNET / IP.



AOP30 operator panel with graphic LCD to provide easy commissioning and parameterization using interactive menus, alarms, and fault codes.

Specific functions G Series - G150BR

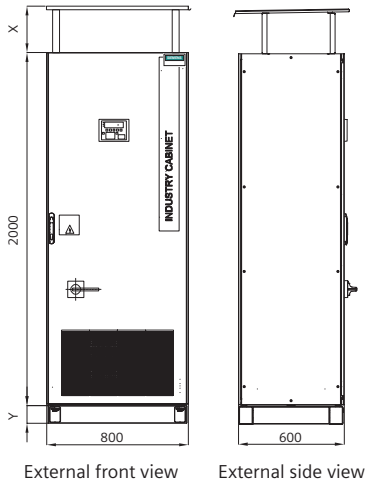
	Drive Control Chart (DCC)	<p>Drive Control Chart (DCC) is an additional tool for the easy configuration of technological functions for the frequency inverter. The block library contains a large selection of control, arithmetic and logic blocks as well as extensive open-loop and closed-loop control functions. DCC editor enables easy graphics-based configuration, allows control loop structures to be clearly represented and provides a high degree of reusability of charts that have already been created. DCC is an add-on for the STARTER commissioning too</p>
	Brake control	<p>"Simple brake control" for controlling holding brakes: The holding brake is used to secure drives against unwanted motion when deactivated.</p> <p>Function module "Complex braking control" is used for motor holding brakes and operational brakes, being able to operate as per the internal and external signal feedback.</p>
	Configuration protection	<p>Write protection to prevent unintentional changing of the setting parameters (without password function).</p>
	Know-how protection	<p>Know-how protection for encrypting stored data, e.g. to protect expert configuring knowledge, and to protect against modification and duplication (with password function).</p>
	Web server	<p>The integrated web server provides information about the device. The web server is accessed using a web browser via unsecured (http) or secured transfer protocol (https).</p>
	Motor blocking protection	<p>A blocked motor is detected and protected against thermal overloading by a fault trip.</p>
	Vdc_min contro	<p>In the event of a power supply voltage drop, the kinetic energy of the rotating drive is used to buffer the DC link in order to avoid under voltage alarms. The inverter remains operational as long as the drive can provide regenerative energy as a result of its motion and the DC link voltage does not drop below the shutdown threshold. When the line supply recovers within this time, the drive is again bumplessly accelerated up to its setpoint speed.</p>
	Motor temperature evaluation	<p>Motor protection by evaluating a KTY84, PTC or Pt100 temperature sensor. When a KTY84 temperature sensor is connected, the limit values can be set for alarm or shutdown. When a PTC thermistor is connected, the system reaction to triggering of the thermistor (alarm or trip) can be defined.</p>

Industry Cabinet G Series - G150BR												
ID	Rated Current			Rated Power		Frame	Weight (kg)	Max. cables length (m)		Dissipated Power (kW)	Cooling air requirement	
	In (380 ... 480 V 3 AC)	IL (380 ... 480 V 3 AC)	IH (380 ... 480 V 3 AC)	kW	hp			IP21 without Options	Shielded cables			Unshielded cables
G150BR-A0110-SB0	210	205	178	110	150	FX	460	300	450	2,54	0,17	
G150BR-A0132-SB0	260	250	233	132	200	FX	460	300	450	3,36	0,23	
G150BR-A0160-SB0	310	302	277	160	250	FX	670	300	450	4,07	0,36	
G150BR-A0200-SB0	380	370	340	200	300	GX	670	300	450	4,67	0,36	
G150BR-A0250-SB0	490	477	438	250	400	GX	670	300	450	5,96	0,36	
G150BR-A0315-SB0	605	590	460	315	500	HX	750	300	450	8,3	0,78	
G150BR-A0400-SB0	745	725	570	400	600	HX	750	300	450	9,7	0,78	
G150BR-A0450-SB0	840	820	700	450	700	HX	780	300	450	10,2	0,78	
G150BR-A0560-SB0	985	960	860	560	800	JX	1100	300	450	14,7	1,48	
G150BR-A0630-PB0	1119	1090	850	630	900	LX	1700	300	450	16,6	1,56	
G150BR-A0710-PB0	1378	1340	1054	710	950	LX	1750	300	450	19,4	1,56	
G150BR-A0900-PB0	1554	1515	1294	900	1250	LX	2130	300	450	20,4	1,56	

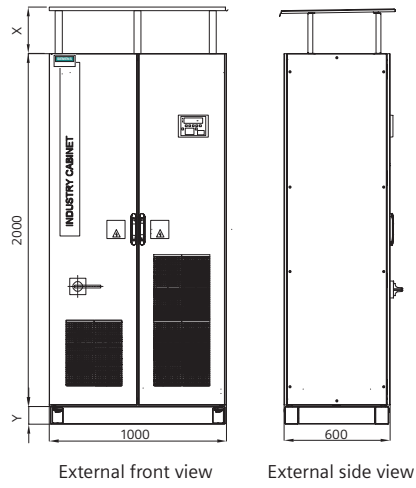
ID	Rated Current			Rated Power		Frame	Weight (kg)	Max. cables length (m)		Dissipated Power (kW)	Cooling air requirement
	In (660 ... 690 V 3 AC)	IL (660 ... 690 V 3 AC)	IH (660 ... 690 V 3 AC)	kW	hp			IP21 without Options	Shielded cables		
G150BR-B0075-SB0	85	80	76	75	100	FX	460	300	450	1,7	0,17
G150BR-B0090-SB0	100	95	89	90	125	FX	460	300	450	2,1	0,17
G150BR-B0110-SB0	120	115	107	110	150	FX	460	300	450	2,7	0,17
G150BR-B0132-SB0	150	142	134	132	200	FX	460	300	450	2,8	0,17
G150BR-B0160-SB0	175	171	157	160	250	FX	670	300	450	3,8	0,36
G150BR-B0200-SB0	215	208	192	200	300	FX	670	300	450	4,2	0,36
G150BR-B0250-SB0	260	250	233	250	400	FX	670	300	450	5	0,36
G150BR-B0315-SB0	330	320	280	315	500	FX	670	300	450	6,1	0,36
G150BR-B0400-SB0	410	400	367	400	600	HX	780	300	450	8,1	0,78
G150BR-B0450-SB0	465	452	416	450	700	HX	780	300	450	9,1	0,78
G150BR-B0560-SB0	575	560	514	560	800	HX	840	300	450	10,8	0,78
G150BR-B0710-SB0	735	710	657	710	950	JX	1320	300	450	13,5	1,48
G150BR-B0800-SB0	810	790	724	800	1000	JX	1360	300	450	14,7	1,48
G150BR-B1000-PB0	1064	1028	950	1000	1350	LX	1700	300	450	21,3	1,56
G150BR-B1350-PB0	1360	1314	1216	1350	1800	MX	1710	300	450	26,6	2,96
G150BR-B1500-PB0	1499	1448	1340	1500	2000	MX	2130	300	450	29	2,96
G150BR-B1750-PB0	1729	1720	1547	1750	2350	SX	3010	300	450	35	3,67
G150BR-B1950-PB0	1948	1940	1742	1950	2600	SX	3010	300	450	38	3,67
G150BR-B2150-PB0	2158	2150	1930	2150	2900	SX	3070	300	450	40	3,67
G150BR-B2400-PB0	2413	2390	2158	2400	3200	SX	3860	300	450	46	3,67
G150BR-B2700-PB0	2752	2685	2463	2700	3600	SX+	4580	300	450	52	5,15

Dimensional G Series - G150BR

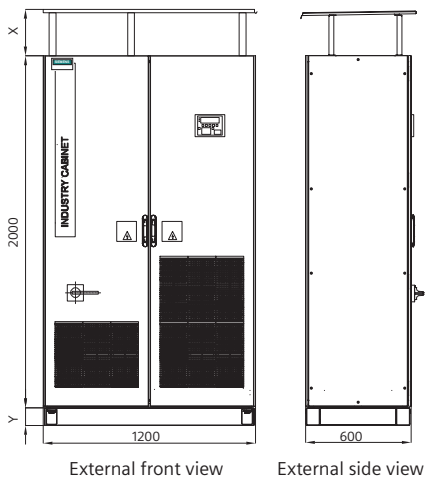
Frame FX



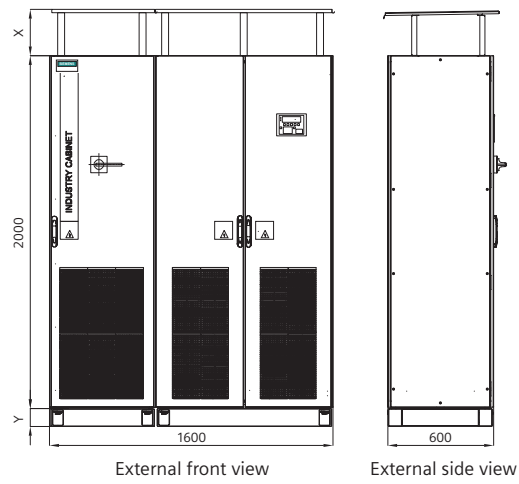
Frame GX



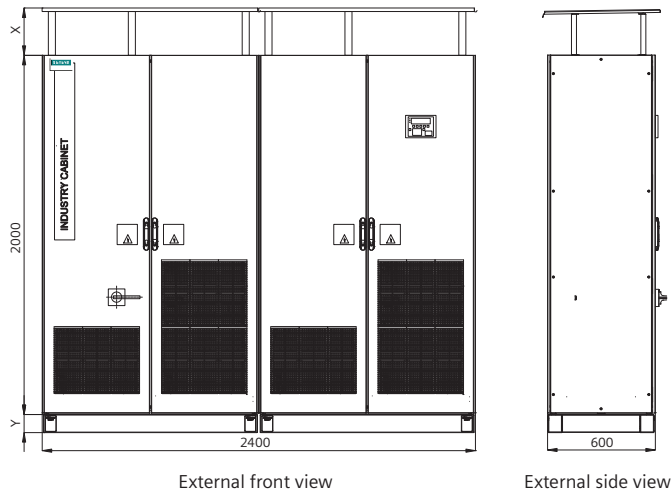
Frame HX



Frame JX



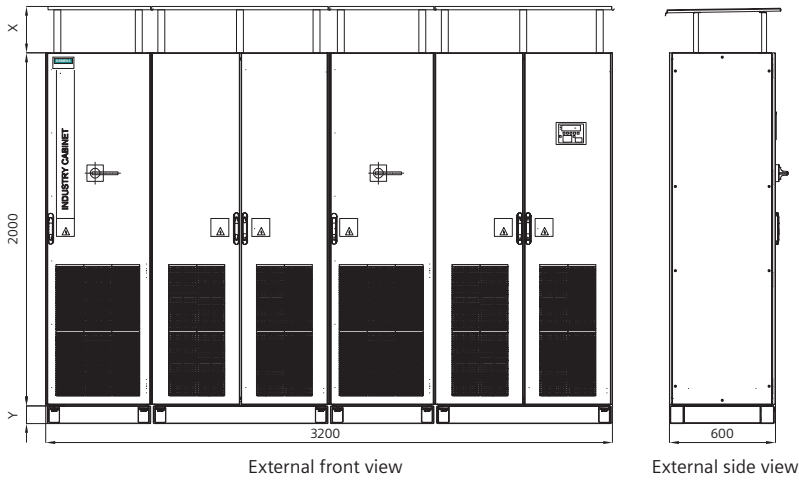
Frame LX



Note: Front and side view considering IP21 degree of protection

Dimensional G Series - G150BR

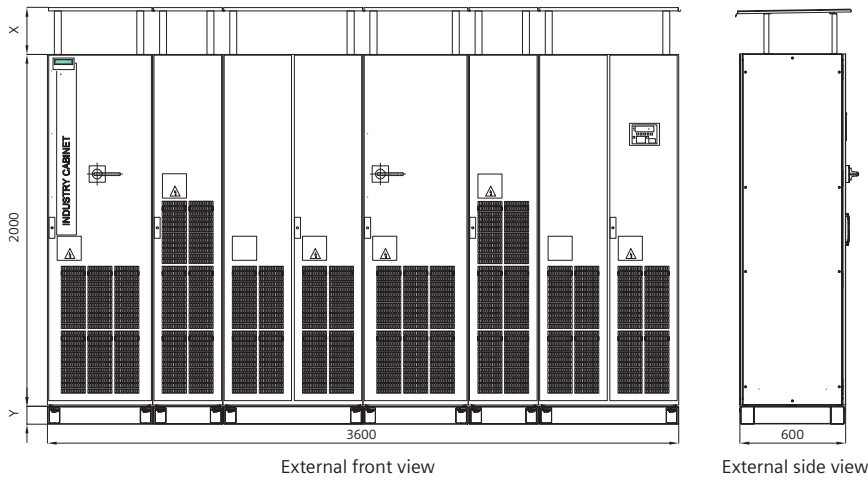
Frame MX



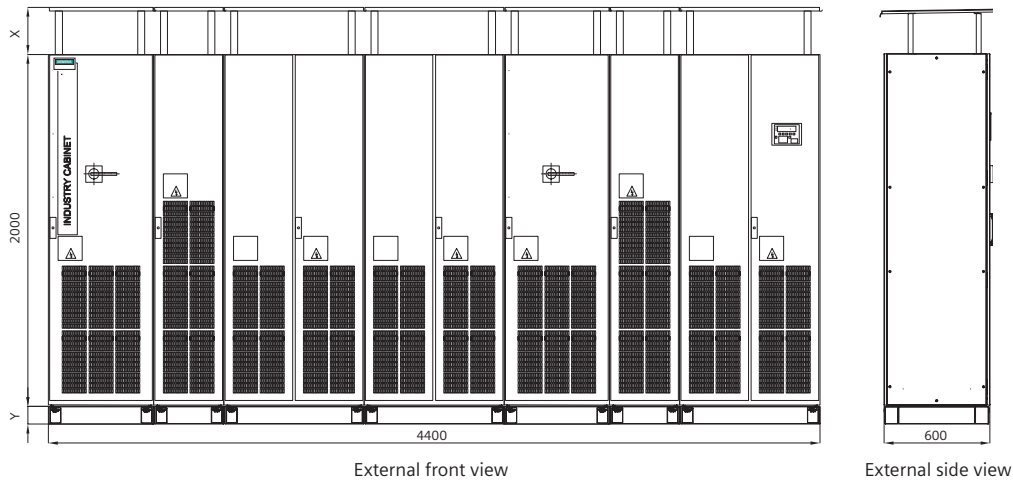
Optional	Y-Dimension
M06	100mm
M07	200mm

Optional	X-Dimension
M21	300mm
M23	400mm
M43	400mm
M54	400mm

Frame SX



Frame SX+



Note: Front and side view considering IP21 degree of protection

General Technical Data

Electrical Specifications	
Input voltage and Rated Power	380 ... 480 V 3 AC $\pm 10\%$, 110 ... 900 kW 660 ... 690 V 3 AC $\pm 10\%$, 75 ... 2700 kW
Input Frequencies	47 ... 63 Hz
Output Frequencies	0 ... 550 Hz
Efficiency	>98 %
Overvoltage Category	III under Standard IEC 61800-5-1
Brake operation	Dynamic Braking with optional Braking Module
Mechanical Specifications	
Degree of protection	Standard: IP20 (with IP21 / IP23 / IP43 / IP54 options)
Panel System	Panels compatible with the industrial standard
Cable entry	Standard from below (options for connections from above)
Paint Finish	RAL 7035
Cooling Method	Forced-Air
Base	Optional with 100 mm or 200 mm
Control Specifications	
Control Methods	Vector control with and without sensor or <i>V/f</i> control
Fixed Speed	15 fixed speeds plus 1 minimum speed, programmable
Skipped speed	4, parameterizable
Setpoint Resolution of the control module	0.001 rpm digital 12-bit analog
Communication Protocols	PROFIBUS Standard / Optional PROFINET or Ethernet
Interfaces	
Digital Inputs	Standard 12 x in Control unit – Optional (8 x in Terminal Module TM31)
Digital Outputs	Standard 8 x in Control unit – Optional (4 x in Terminal Module TM31)
Relay outputs	Optional 2 x in Terminal Module TM31
Analog Inputs	Optional 2 x in Terminal Module TM31
Analog Outputs	Optional 2 x in Terminal Module TM31
Temperature sensor inputs	Standard 1 x KTY84-130, PTC or PT-100 2-wire - Optional (6 x in Terminal Module TM150)
HMI-Human Machine Interface	Advanced Operator Panel AOP30
PC Interface	Via Ethernet
Protection Functions and Software	
Vdc min control	For brief line supply failures, the kinetic energy of the rotating drive is used to buffer the DC link and therefore prevents fault trips. The inverter remains operational as long as the inverter can provide regenerative power as a result of its motion and the DC link voltage does not drop below the shutdown threshold. When the line supply recovers within this time, the drive is again bumplessly accelerated up to its setpoint speed.
Drive Control Chart (DCC)	Drive Control Chart (DCC) is an additional tool for the easy configuration of technological functions for Industry Cabinet. The block library contains a large selection of control, arithmetic and logic blocks as well as extensive open-loop and closed-loop control functions. DCC editor enables easy graphics-based configuration, allows control loop structures to be clearly represented and provides a high degree of reusability of charts that have already been created. DCC is an add-on for the STARTER commissioning tool.
Brake control	"Simple brake control" for controlling holding brakes. The holding brake is used to secure drives against unwanted motion when deactivated. The "Extended braking control" Function module allows complex braking control, for example, for motor holding brakes and operational brakes. In the case of brakes with feedback signal, the brake control reacts to the feedback contacts of the brake.
Write protection	Write protection to prevent unintentional changing of the setting parameters (without password function).
Know-how protection	Know-how protection for encrypting stored data, e.g. to protect configuration know-how, and to protect against changes and duplication (with password function).
Web server	The web server provides information about the drive unit via its web pages. The web server is accessed using a web browser via unsecured (http) or secured transfer protocol (https).

Optionals	Code
Input options	
RFI Filter Category C2	L00
Line Harmonic Filter Compact (LFH compact)	L01
Main contactor (input current \leq 800 A)	L13
Surge suppression (for operation in ungrounded networks)	L21
Line reactor not included (for inverters \leq 500 kW)	L22
Line reactor included $v_k=2\%$ (for inverters $>$ 500 kW)	L23
Main switch incl. fuses or circuit breakers	L26
Quick discharge of LHF filter (L01)	L76
Output options	
dv/dt filter compact plus with voltage peak limiter	L07
Output reactor	L08
dv/dt plus filter with voltage peak limiter	L10
Sine-wave filter	L15
EMC shield bus	M70
Motor safety and protection functions	
Emergency OFF pushbutton on cabinet door	L45
Emergency OFF Category 0, 230 V AC or 24 V DC	L57
Emergency STOP Category 1, 230V AC	L59
Emergency STOP Category 1, 24V AC	L60
PTC thermistor input (alarm)	L83
PTC thermistor input (failure)	L84
Input for up to 6 PT-100 sensors	L86
Insulation monitoring	L87
Increased degree of protection (Standard: IP20)	
Degree of Protection IP21	M21
Degree of Protection IP23	M23
Degree of Protection IP43	M43
Degree of Protection IP54	M54
Mechanical options	
Base 100 mm high, RAL 7022	M06
Cable compartment 200mm high, RAL 7035	M07
Power cable entry from Above the panel	M13
Motor Connection from Above of the panel	M78
Crane transport assembly	M90
Safety Integrated	
Safety license for one axis	K01
Additional SMC30 sensor module	K52
Terminal module for controlling the „Safe Torque Off“ and „Safe Stop 1“ safety functions	K82
TM54F terminal module for extended safety functions	K87
SBA Safe Brake Adapter, 230 V AC	K88

Optionals	Code
Other options	
Communication board CBC10	G20
Communication board CBE20	G33
TM150 terminal module for temperature sensors	G51
TM31 terminal module (customer terminal module)	G60
Additional TM31 terminal module	G61
Terminal Board TB30	G62
SMC30 sensor module	K50
VSM10 voltage sensing module	K51
Auxiliary power supply, 230 V AC	K74
Control unit CU320-2 PN (PROFINET)	K95
Connection for external auxiliary equipment	L19
Cabinet lighting with service socket	L50
Cabinet anti-condensation heating	L55
Braking module 25 kW (P20 power: 100 kW)	L61
Braking module 50 kW (P20 power: 200 kW)	L62
Marking of all control cables	M91
Special cabinet paint finish	Y09
One-line label for system identification, 40 x 80 mm	Y31
Two-line label for system identification, 40 x 180 mm	Y32
Three-line label for system identification, 40 x 180 mm	Y33
Documentation (Standard language: English/Portuguese)	
Documentation, production flowchart: Created once	B43
Documentation, production flowchart: updated every two weeks	B44
Documentation, production flow chart: updated every month	B45
Additional documentation in German	D00
Documentation (circuit diagram, terminal diagram, layout diagram) in DXF format	D02
Customer documentation as hard copy	D04
Preliminary version of customer documentation	D14
Documentation language: English/Spanish	D60
Additional documentation in English	D76
Additional documentation in Spanish	D78
Rating plate data (Standard language: English/Portuguese)	
Rating plate data in English/Spanish	T60
Device acceptance inspection in presence of customer	
Visual acceptance inspection	F03
Function test with no motor connected	F71
Function test with test bay motor under no-load conditions	F75
Insulation Test	F77
Customer-specific acceptance inspection	F97
Device acceptance inspection without presence of customer	
Function test with no motor connected	F72
Function test with test bay motor under no-load conditions	F74
Insulation Test	F76

Industry Cabinet Series S – S150BR

Dynamics and Power Quality

Industry Cabinet S Series - S150BR is Siemens' panel solution for high-efficiency loads, offering high-performance speed control with high accuracy and dynamic response. It is particularly suitable for use in situations requiring strong demands on dynamics and speed accuracy, frequent braking cycles with high-energy recovery and four-quadrant operations - e.g. centrifuges, elevators, presses, cable winches, and more.


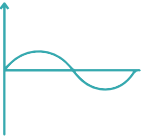





Acting on a wide range of powers, the equipment also offers the possibility of reactive energy compensator, being able to operate with the parameterizable power factor. The flexibility generated by the variety of options brings to the customer several possibilities for adjusting the panel according to their needs, in addition to its quality of assembly and ease in commissioning

The Industry Cabinet S150BR has a panel mounted regenerative frequency inverter, fully digital, with AFE grinding system, intermediate circuit with constant voltage, inverter part with Insulated Gate Bipolar Transistor, IGBT PWM type modulation, and with V/f scalar control modes, or vector with or without speed feedback.

The maintenance is a very important factor to longer equipment useful life as well in the S150BR; this is facilitated by the technology of removable power modules, which facilitates the handling of the equipment during an intervention. This completes the list of benefits that this product offers to meet all expectations of a high quality Siemens product.



Specific functions S Series - S150BR

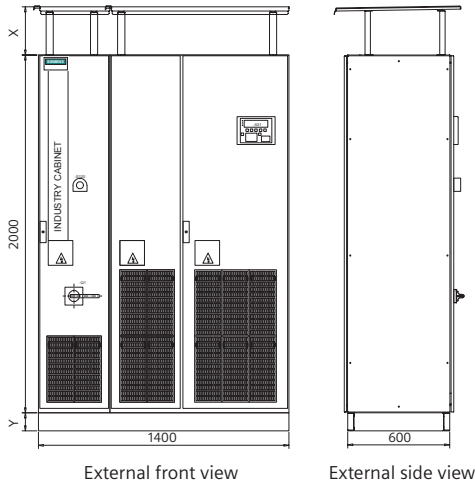
	Energy recovery	The grinding system consisting of IGBT enables the operation of the inverter with energy recovery. This feature makes the S150BR a product capable of driving with high dynamic performance and applications with full energy regeneration, returning to the supply network clean power.
	Built-in harmonic filter	With the built-in harmonic filter AIM (Active Interface Module), the S150BR does not generate relevant harmonics for the equipment power supply and can be applied in networks sensitive to the disturbances generated by the 6-pulse rectifier system. The strict limit values of IEEE 519 are met, without exceptions. The total harmonic distortion of THD (I) current and THD (U) voltage is typically close to 3 percent.
	Resistant to voltage fluctuations	Unlike standard grinding systems, the S150BR grinder generates a controlled DC voltage that is kept constant despite fluctuations in the line supply voltage if the line supply voltage fluctuates within the permitted tolerance range.
	Reactive power compensation	Thanks to the rectifier being composed of a switched source (rectifier bridge formed by IGBT's) it is possible to parameterize the power factor resulting from the operation of the equipment, resulting in a reactive power compensation (capacitive/inductive).
	High dynamic performance	The four-quadrant operation allows the use of the equipment in drives that require high dynamic performance, supported by the high technology present in its control and power units.
	Drive Control Chart (DCC)	Drive Control Chart (DCC) is an additional tool for the easy configuration of technological functions for frequency inverter. The block library contains a large selection of control, arithmetic and logic blocks as well as extensive open-loop and closed-loop control functions. DCC editor enables easy graphics-based configuration, allows control loop structures to be clearly represented and provides a high degree of reusability of charts that have already been created. DCC is an add-on for the STARTER commissioning tool.
	Easy Maintenance	The modular design of the power modules simplifies maintenance services. Using removable power modules, equipment maintenance becomes simple, bringing significant after-sales gains.

Industry Cabinet Series S - S150BR											
ID	Output Current			Rated Power		Frame	Weight (kg)	Max. cables length (m)		Dissipated Power (kW)	Cooling air requirement
	In (380 ... 480 V 3 AC)	IL (380 ... 480 V 3 AC)	IH (380 ... 480 V 3 AC)	kW	hp		IP21 without Options	Shielded cables	Unshielded cables	400 V/40 °C sem Optional	m³/s
S150BR-A0110-SAO	210	205	178	110	150	FSX	708	300	450	6.49	0.58
S150BR-A0132-SAO	260	250	233	132	200	FSX	708	300	450	7.85	0.70
S150BR-A0160-SAO	310	302	277	160	250	GSX	892	300	450	10.45	1.19
S150BR-A0200-SAO	380	370	340	200	300	HSX	980	300	450	11.15	1.19
S150BR-A0250-SAO	490	477	438	250	400	HSX	980	300	450	13.65	1.19
S150BR-A0315-SAO	605	590	460	315	500	JSX	1716	300	450	18.55	1.96
S150BR-A0400-SAO	745	725	570	400	600	JSX	1731	300	450	21.75	1.96
S150BR-A0450-SAO	840	820	700	450	700	JSX	1778	300	450	22.25	1.96
S150BR-A0560-SAO	985	960	860	560	800	LSX	2408	300	450	28.65	2.60
S150BR-A0710-SAO	1260	1230	1127	710	900	LSX	2408	300	450	34.85	2.60
S150BR-A0800-SAO	1405	1370	1257	800	1150	LSX	2408	300	450	35.85	2.60

ID	Output Current			Rated Power		Frame	Weight (kg)	Max. cables length (m)		Dissipated Power (kW)	Cooling air requirement
	In (500 ... 690 V 3 AC)	IL (500 ... 690 V 3 AC)	IH (500 ... 690 V 3 AC)	kW	hp		IP21 without Options	Shielded cables	Unshielded cables	400 V/40 °C sem Optional	m³/s
S150BR-B0075-SAO	85	80	76	75	100	FSX	708	300	450	4,45	0,58
S150BR-B0090-SAO	100	95	89	90	125	FSX	708	300	450	4,65	0,58
S150BR-B0110-SAO	120	115	117	110	150	FSX	708	300	450	5,12	0,58
S150BR-B0132-SAO	150	142	134	132	200	FSX	708	300	450	4,97	0,58
S150BR-B0160-SAO	175	170	157	160	250	GSX	892	300	450	11,15	1,19
S150BR-B0200-SAO	215	208	192	200	300	GSX	892	300	450	11,56	1,19
S150BR-B0250-SAO	260	250	233	250	400	GSX	892	300	450	12,03	1,19
S150BR-B0315-SAO	330	320	280	315	500	GSX	892	300	450	12,63	1,19
S150BR-B0400-SAO	410	400	367	400	600	JSX	1716	300	450	18,86	1,96
S150BR-B0450-SAO	465	452	416	450	700	JSX	1716	300	450	19,47	1,96
S150BR-B0560-SAO	575	560	514	560	800	JSX	1716	300	450	22,85	1,96
S150BR-B0710-SAO	735	710	657	710	950	LSX	2300	300	450	28,75	2,6
S150BR-B0800-SAO	810	790	724	800	1000	LSX	2408	300	450	32,75	2,6
S150BR-B0900-SAO	910	880	814	900	1200	LSX	2408	300	450	32,85	2,6
S150BR-B1000-SAO	1025	1000	917	1000	1350	LSX	2408	300	450	34,25	2,6
S150BR-B1200-SAO	1270	1230	1136	1200	1600	LSX	2408	300	450	39,25	2,6

Dimensional S Series - S150BR

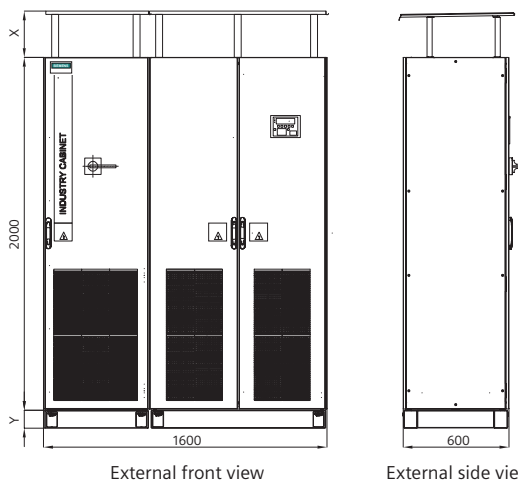
Frame FSX



External front view

External side view

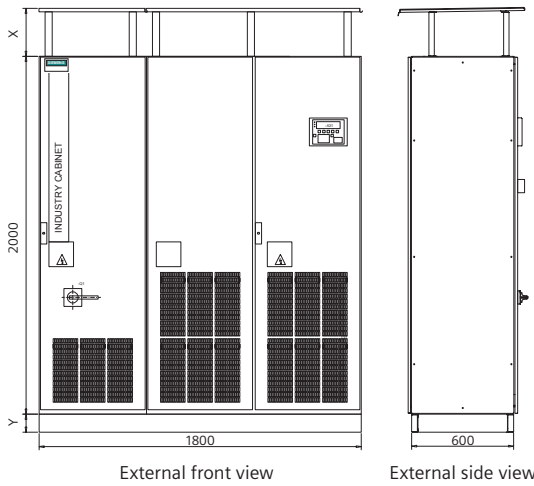
Frame GSX



External front view

External side view

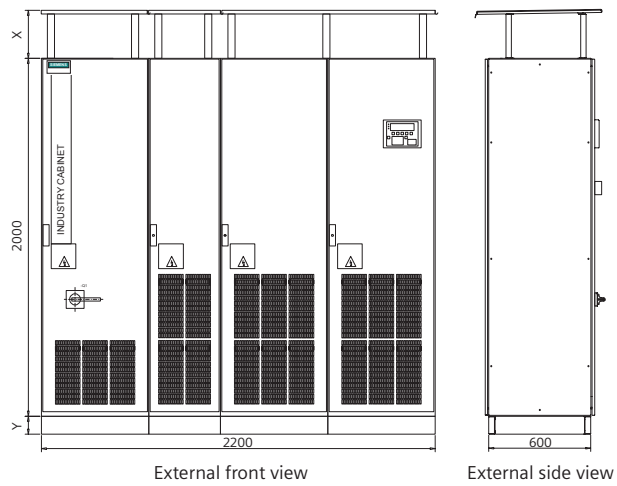
Frame HSX



External front view

External side view

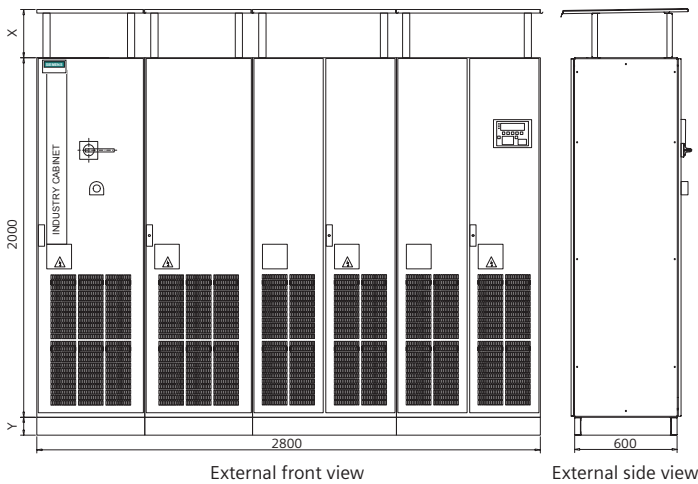
Frame JSX



External front view

External side view

Frame LSX



External front view

External side view

Optional	Y-Dimension
M06	100mm
M07	200mm

Optional	X-Dimension
M21	300mm
M23	400mm
M43	400mm
M54	400mm

Note: Front and side view considering IP21 degree of protection

General Technical Data

Electrical Specifications	
Input voltage and Rated Power	380 ... 480 V 3 AC $\pm 10\%$, 110 ... 800 kW 500 ... 690 V 3 AC $\pm 10\%$, 75 ... 1200 kW
Input Frequencies	47 ... 63 Hz
Output Frequencies	0 ... 550 Hz
Fator de Potência λ	Parameterizable (factory $\cos \Phi = 1$)
Efficiency	>96 %
Overvoltage Category	III under Standard IEC 61800-5-1
Brake operation	Operation in standard 4-quadrants and Brake Module as an option
Mechanical Specifications	
Degree of protection	IP20 (with IP21 / IP43 / IP54 options)
Panel System	Panels compatible with Industrial standard, double-locked doors
Cable entry	Standard from below (options for connections from above)
Paint Finish	RAL 7035
Cooling Method	Forced-Air
Base	Optional with 100 mm or 200 mm
Control Specifications	
Control Methods	Vector control with and without sensor or V/f control
Fixed Speed	15 fixed speeds plus 1 minimum speed, programmable
Skipped speed	4, parameterizable
Setpoint Resolution of the control module	0.001 rpm digital 12-bit analog
Communication Protocols	PROFIBUS Standard Optional PROFINET or Ethernet
Interfaces	
Digital Inputs	12 x in Control Unit Standard (8 x in Terminal Module TM31) Optional
Digital Outputs	8 x in Control Unit Standard (4 x in Terminal Module TM31) Optional
Relay outputs	Optional 2 x in Terminal Module TM31
Analog Inputs	Optional 2 x in Terminal Module TM31
Analog Outputs	Optional 2 x in Terminal Module TM31
HMI-Human Machine Interface	Advanced Operator Panel AOP30
PC Interface	Via Ethernet
Protection Functions and Software	
Vdc min control	For brief line supply failures, the kinetic energy of the rotating drive is used to buffer the DC link and therefore prevents fault trips. The inverter remains operational as long as the inverter can provide regenerative power as a result of its motion and the DC link voltage does not drop below the shutdown threshold. When the line supply recovers within this time, the drive is again bumplessly accelerated up to its setpoint speed.
Drive Control Chart (DCC)	The Control Chart Drive (DCC) is an additional tool for the easy configuration of technological functions for Smart Cabinet. The block library contains a large selection of control, arithmetic and logic blocks as well as extensive open-loop and closed-loop control functions. DCC editor enables easy graphics-based configuration, allows control loop structures to be clearly represented and provides a high degree of reusability of charts that have already been created. DCC is an add-on for the STARTER commissioning tool.
Write protection	Write protection to prevent unintentional changing of the setting parameters (without password function).
Know-how protection	Optional 2 x in Terminal Module TM31
Web server	Know-how protection for encrypting stored data, e.g. to protect configuration know-how, and to protect against changes and duplication (with password function).
PC Interface	The web server provides information about the drive unit via its web pages. The web server is accessed using a web browser via unsecured (http) or secured transfer protocol (https).

Optionals	Code
Input options	
RFI Filter (Class A1)	L00
Rectifier function of lower level	L04
Surge-protective device (for operations in non-grounded networks)	L21
Main disconnecter with fuses ($\leq 800A$) or 3WL circuit breaker ($> 800A$)	L26
Input filter monitoring	L40
EMC shield bus	M70
Output options	
Compact dv/dt filter with peak voltage limiter	L07
Output reactor	L08
dv/dt plus filter with voltage peak limiter	L10
Sine-wave filter	L15
Motor protection and safety functions	
Emergency OFF pushbutton on cabinet door	L45
Emergency OFF Category 0, 230V AC or 24V DC	L57
Emergency STOP Category 1, 230V AC	L59
Emergency STOP Category 1, 24V AC	L60
Thermistor protection unit with PTB approval (alarm)	L83
Thermistor protection unit with PTB approval (switch-off)	L84
PT100 evaluation unit for 6 sensors	L86
Insulation monitoring	L87
Additional shock protection	M60
Increased degree of protection (Standard: IP20)	
Degree of Protection IP21	M21
Degree of Protection IP23	M23
Degree of Protection IP43	M43
Degree of Protection IP54	M54
Mechanical options	
Base 100 mm high, RAL 7022	M06
Cable compartment 200mm high, RAL 7022	M07
Line connection from above the panel	M13
Motor Connection from Above of the panel	M78
Crane transport assembly	M90
Integrated Safety Functions	
Safety Integrated extended functions (for one axis)	K01
Additional SMC30 sensor module	K52
Terminal Module for controlling the Safe Torque Off and Safe Stop 1 safety functions	K82
TM34F terminal module for extended safety functions	K87
SBA Safe Brake Adapter, 230 V AC	K88

Other Options	
CBC10 Communication Board (CAN)	G20
CBE20 Communication Board (Profinet / Ethernet IP)	G33
TM150 terminal module for temperature sensors	G51
TM31 terminal module (customer terminal module)	G60
Additional TM31 terminal module	G61
Terminal Board TB30	G62
SMC10 sensor module (for encoder use)	K46
SMC20 sensor module (for encoder use)	K48
SMC30 sensor module (for encoder use)	K50
VSM10 voltage sensor module	K51
Change of CU320-2 PB (Profibus) to CU320-2 PN (Profinet)	K95
Cabinet lighting with service socket	L50
Cabinet anti-condensation heating	L55
Braking unit 25 kW (P20 power: 100 kW) + Resistor mounted EXTERNALLY	L61
Braking unit 50 kW (P20 power: 200 kW) + Resistor mounted EXTERNALLY	L62
Marking of all control cable (including X30)	M91
Special cabinet paint finish	Y09
One-line label for system identification, 40 × 80 mm	Y31
Two-line label for system identification, 40 × 180 mm	Y32
Two-line label for system identification, 40 × 180 mm	Y33
Device acceptance inspection in presence of customer	
Visual acceptance inspection	F03
Function test with no motor connected	F71
Function test with test bay motor under no-load conditions	F75
Insulation Test (In conjunction with F71 or F75)	F77
Customer-specific acceptance inspection	F97
Device acceptance inspection without presence of customer	
Function test with no motor connected	F72
Function test with test bay motor under no-load conditions	F74
Insulation Test (in conjunction with F72 or F74)	F76
Siemens Standard Documentation (Standard language: Portuguese/English)	
Circuit diagram, terminal diagram, layout diagram in DXF format	D02
Documentation as hard copy	D04
Preliminary version of technical documentation	D14
Documentation language: English/French	D58
Documentation language: English/Spanish	D60
Rating plate data (Standard language: Portuguese/English)	
Rating plate data in English/Spanish	T60

Option selection Matrix for Industry Cabinet family

Certain options are mutually exclusive, so there are some combinations that cannot be selected. The tables below cover the whole Industry Cabinet family and show an overview of these interlocks. For more details on the options described and their incompatibilities, please consult their individual description in the topic below.

	G20	G33	G51	G62	K46	K48	K50	K51	K52	K83	K84	K96	K98	M06	M07	L86
G20	Not possible	Not possible		Not possible												
G33	Not possible	Not possible		Not possible												
G51			Not possible													Not possible
G62	Not possible	Not possible		Not possible												
K46					Not possible	Not possible	Not possible	Not possible	Not possible							
K48						Not possible	Not possible	Not possible	Not possible							
K50							Not possible	Not possible	Not possible							
K51								Not possible	Not possible							
K52									Not possible							
K83										Not possible	Not possible					
K84											Not possible					
K96												Not possible	Not possible			
K98													Not possible	Not possible		
M06														Not possible	Not possible	
M07															Not possible	Not possible
L86			Not possible													Not possible

	L00	L01	L07	L08	L10	L15	L22	L23	L57	L59	L60	L61/ L64	L62/ L65	L87	M13	M70	M78	K82
L00	Not possible						Not possible	Not possible						Not possible				
L01		Not possible						Not possible										
L07			Not possible	Not possible									Not possible				Not possible	
L08			Not possible	Not possible									Not possible				Not possible	
L10				Not possible	Not possible												Not possible	
L15				Not possible	Not possible	Not possible											Not possible	
L22	Not possible	Not possible					Not possible	Not possible										
L23		Not possible						Not possible	Not possible	Not possible								
L57									Not possible	Not possible								
L59										Not possible								
L60											Not possible	Not possible						
L61/ L64												Not possible	Not possible					
L62/ L65													Not possible					
L87	Not possible													Not possible				Not possible
M13															Not possible	Not possible		
M70																Not possible	Not possible	
M78																	Not possible	Not possible
K82																		Not possible

Not possible

Description of options for Industry Cabinet family

F03,F71,F75,F77,F97

Inverters acceptance tests with the customer present

F72,F74,F76

Inverters acceptance tests without the customer present

Optional	Description
F03	<p>Visual acceptance inspection</p> <p>The tests must be carried out when the inverter is de-energized. The items below are included in the scope of delivery:</p> <ul style="list-style-type: none"> • Check of degree of protection • Check of equipment (components) • Check of the equipment identifiers • Check of leakage current and air isolation distance • Check of cables • Check of customer documentation
F71,F72	<p>Function test with no motor connected</p> <p>After visual inspection with the inverter switched off, it is connected to rated voltage. The following is included in the scope of the acceptance test:</p> <ul style="list-style-type: none"> • Visual acceptance as described in F03 • Check of power supply • Check of protective and monitoring devices (simulation) • Check of fans
F74,F75	<p>Function test with test bay motor under no-load conditions</p> <p>After the visual acceptance inspection with the inverter switched off, the inverter is connected to rated voltage. A small current flows at the inverter output, in order to operate the motor under no-load conditions. The following is included in the scope of the acceptance test:</p> <ul style="list-style-type: none"> • Visual acceptance inspection as described in F03 • Check of power supply • Check of protective and monitoring devices (simulation) • Check of fans • Pre-loading test • Test of motor operation under no-load condition
F76,F77	<p>Acceptance test of the insulation of the inverter</p> <p>The following is included in the scope of the acceptance test:</p> <ul style="list-style-type: none"> • High-voltage test • Measurement of the insulation resistance
F97	<p>Inspections according to the customer-specifics needs</p> <p>If acceptance tests are desired which are not covered by the options F03, F71/F72, F74/F75 or F76/F77, customer-specific acceptance tests, these can be ordered using order code F97 following technical clarification.</p>

G20**Communication board CBC10**

The CBC10 Communication Board is used to connect the CU320-2 Control Unit (and thus the inverter system) to the CAN (Controller Area Network) protocol. The associated driver software fulfils the standards of the following CANopen specification of the CiA organization (CAN in Automation):

- Communication profiles according to DS 301
- Drive profile according to DSP 402 (in this case Profile Velocity Mode)
- EDS (Electronic Data Sheet) according to DSP 306
- Operational status signaling according to DSP 305

Note: The CAN address is set on the CU320-2 DP Control Unit by means of the two address switches. These address switches are not available on the control unit. CU320-2 PN. In this case, the address can be set by means of parameters.

G33**Communication board CBE20**

A CBE20 communication board is required when:

- An inverter is equipped with a CU320-2 DP (PROFIBUS) Control Unit, is to be connected to a PROFINET IO network
- SINAMICS Link is to be used to exchange data between directly several CU320-2 DP (PROFIBUS) or CU320-2 PN (PROFINET) Control Units without using a higher-level control system.
- Communication EtherNet/IP is to be supported

With the CBE20 communication board, the inverter becomes a PROFINET IO device and offers the following functions:

- PROFINET IO device
- Full 100 Mbit/s full duplex
- Supports real-time classes of PROFINET IO -
- RT (real time)
- IRT (Isochronous Real-Time), minimum send cycle 500 us
- Connects to controllers as a PROFINET IO device according to the PROFIdrive profile
- Standard TCP/IP communication for engineering processes using the STARTER commissioning tool
- Integrated 4-port switch with four RJ45 sockets based on PROFINET ASICs ERTEC400. The optimum topology (line, star, and tree) can therefore be configured without additional external switches.

G51**TM150 terminal module for temperature sensors**

The TM150 Terminal Module is a DRIVE-CLiQ component for acquiring and evaluating data from various temperature sensors. The temperature is measured over a temperature range of -99°C to +250°C for the following temperature sensors:

- Pt100 (with monitoring for open-circuit and short-circuit)
- Pt1000 (with monitoring for open-circuit and short-circuit)
- KTY84 (with monitoring for open-circuit and short-circuit)
- PTC (with short-circuit monitoring)
- Bimetallic NC contact (without monitoring)

For the temperature sensor inputs, for each terminal block the evaluation can be parameterized to 1 x 2 wires, 2 x 2 wires, 3 wires or 4 wires. There is no galvanic isolation in the Terminal Module TM150.

A maximum of 12 temperature sensors can be connected to the Terminal Module TM150.

G60**TM31 terminal module (customer terminal module)**

The TM31 Terminal Module is used to increase the amount of terminals available to the user in the CU320-2 control unit.

The following additional interfaces are available:

- 8 digital inputs
- 4 bidirectional digital inputs / outputs
- 2 relay outputs with changeover contact
- 2 analog inputs
- 2 analog outputs
- 1 temperature sensor input (KTY84-130 / PTC)
- 2 DRIVE-CLiQ sockets
- 1 connection to the electronic power supply via the 24 V DC power supply connector
- 1 PE connector

G62**TB30 Terminal Board**

The TB30 terminal board offers the possibility of expanding the CU320-2 control unit by four digital inputs/outputs each as well as two analog inputs/outputs each.

Note: Option G62 cannot be combined with options G20 (CBC10 communication board) or G33 (CBE20 communication board).

K01**Safety Integrated extended functions (for one axis)**

The basic functions of Integrated Security do not require a license. However, the Safety Integrated extended functions require a license for each axis equipped with safety functions. It is irrelevant which and how many safety functions are used. Option K01 contains the license for an axis.

Subsequent licensing is possible in the Internet via the WEB License Manager by generating a license key:

www.siemens.com/automation/license

K50**SMC30 sensor module**

The SMC30 Sensor Module panel-mounted can be used to evaluate the encoders of motors without a DRIVE-CLiQ interface. External encoders can also be connected via the SMC30 module.

The following encoder signals can be evaluated:

- Incremental encoders TTL/HTL with/without open-circuit detection (open-circuit detection is only available with bipolar signals)
- SSI encoders with TTL/HTL incremental signals
- SSI encoders without incremental signals

The motor temperature can also be measured using KTY84-130 or PTC thermistors.

K51**VSM10 voltage sensing module**

The VSM10 Voltage Sensing Module enables the line or motor voltage characteristic to be measured precisely. The phase differential voltage can be measured, either grounded (in the delivery state with jumper plugged in) or isolated.

The VSM10 voltage sensing module is used so the following function can be implemented:

- Operation of a permanent-magnet synchronous motor without encoder with the requirement of being able to connect to a motor that is already running (flying restart function).
- Quick flying restart of large induction motors. The time for demagnetizing the motor is eliminated through the measurement of the voltage.

K74**220V AC power supply**

If there is no 230V AC auxiliary power supply in the plant, it is essential to select option K74 to supply an auxiliary voltage for controlling external circuits.

Note: Option K74 is essential for the operation of the options below:

L01, L13, L19, L57, L60, L83, L84, L86 for frame FX and HX

Options L50 and L55 always require an external supply voltage and must not be supplied via option K74.

K82**Terminal module for controlling the "Safe Torque Off" and "Safe Stop 1" safety functions**

The terminal module is used to control the "integrated safety basic functions".

- Safe Torque Off (STO)
- Safe Stop 1 (SS1) (time-controlled) over a wide voltage range from DC/AC 24 V to 240 V (terminology according to IEC 61800-5-2)

The integrated safety functions, starting from the Safety Integrated (SI) input terminals of the components (Control Unit and Power Module) meet the requirements of EN 61800-5-2, EN 60204-1, DIN EN ISO 13849-1 Category

3 for Performance Level (PL) of IEC 61508 SIL 2.

The Safety Integrated functions using option K82 are only available in conjunction with certified components and software versions.

The SINAMICS Safety Integrated functions are certified by independent institutes. An up-to-date list of certified components is available on request.

K83**Safety Function Category 0 (STO)**

This option activates the Safe Torque Off (STO) safety function of the inverter.

Connection contacts are provided for the user on a terminal block for connecting two-channel safety sensors. A start or recognition button can also be connected via terminal block.

K84**Safety Function Category 1 (SS1)**

This optional enables braking with time control of the motor (SS1) according to a braking ramp (0.5 - 30 s) with subsequent Safe Torque Off (STO).

Connection contacts are provided for the user on a terminal block for connecting two-channel safety sensors. A start or recognition button can also be connected via terminal block.

K87**TM54F terminal module for extended safety functions**

The TM54F Terminal Module is a terminal expansion module with safe digital inputs and outputs for controlling the Safety Integrated functions.

The TM54F provides four fail-safe digital outputs and ten failsafe digital inputs. A fail-safe digital output consists of one 24 V DC switching output, one output switching to ground and one digital input to check the switching state. A fail-safe digital input consists of two digital inputs.

K88**SBA Safe Brake Adapter, 230 V AC**

Safe Brake Control (SBC) is a safety function that is used in safety-related applications. In the no-current state, the brake acts on the drive motor. The brake is released when current flows in it (low active).

L00**RFI Filter Category C2**

The inverters are equipped as standard with a radio interference suppression filter, which conforms to the limits defined in Category C3. Using option L00, the inverters are equipped with an RFI filter, meeting the limits for use in the first environment (Category C2) as specified in EN 61800-3

The panels comply with the noise immunity requirements defined in EN 61800-3 as standard for the first and second environments. In conjunction with line reactors, line filters also limit the conducted interference emitted by the Power Modules to the limit values of Category C2 defined in product standard EN 61800-3.

L01**Line Harmonic Filter Compact (LFH compact)**

This filter allows an effective limitation of the line harmonic components that arise in inverters with a rectifier bridge circuit, caused by its operating principle.

As a result of significantly reducing these low-frequency interference variables, voltage distortion can be effectively neutralized at the point of network connection and thus consistently limited to a value below 5% of the harmonic distortion rate (THD). The stringent limit values of IEEE 519-1992 are fully complied with; when network stiffness is sufficient (RSC > 20 is required).

Note: This option changes equipment dimensions (values upon request).

L07**dv/dt filter compact plus with voltage peak limiter**

dv/dt filters compact plus VPL (Voltage Peak Limiter) limit the voltage rate-of-rise dv/dt to values of < 1600 V/ μ s and the typical voltage peaks to the following values in accordance with the limit value curve A according to IEC 60034-25: 2007:

- < 1150 V at Uline < 575 V
- < 1400 V at 660 V < Uline < 690 V

The dv/dt filter compact plus VPL functionally consists of two components that are supplied as a compact mechanical unit, the dv/dt reactor and the voltage-limiting network (VPL), which limits voltage peaks and feeds back the energy to the DC link.

By using a dv/dt filter compact plus VPL, standard motors with standard insulation and without insulated bearings can be used with supply voltages up to 690 V in inverter operation.

dv/dt filters compact plus VPL are designed for the following maximum motor cable lengths:

- Shielded cables: 100m
- Unshielded cables: 150m

For longer cable lengths (> 100 m shielded, >150 m unshielded), the dv/dt filter plus VPL (option L10) should be used.

Notice:

- Operation with output frequencies < 10 Hz is permissible for max. 5 min.
- The maximum permissible output frequency is 150 Hz.

Note: This option changes the equipment dimensions (values upon request)

L08**Motor reactor**

Motor reactors reduce the voltage load on the motor windings by reducing the voltage gradients at the motor terminals that occur during inverter operation. At the same time, the capacitive charge/discharge currents that place an additional load on the inverter output when long motor cables are used, are reduced. Therefore, the use of output reactors with long cable lengths can have a positive effect on the life expectancy of the motor and the inverter.

The reduction in voltage increase in the output circuit also attenuate the eddy currents in the motor bearing. However, this reduction is generally not sufficient to dispense with the use of an isolated NDE bearing on the motor.

Note: The maximum permissible output frequency when an output reactor is used is 150 Hz.

Motor reactors are designed for the following maximum motor cable lengths:

- Shielded cables: 300m
- Unshielded cables: 450m

L10**dv/dt plus filter with voltage peak limiter**

dv/dt filters plus VPL (Voltage Peak Limiter) limit the voltage rate of-rise dv/dt to values < 500 V/μs and the typical voltage peaks to the following values in accordance with the limit value curve according to IEC/TS 60034-17: 2006:

- < 1000 V T Uline < 575 V
- < 1250 V at 660 V < Uline < 690 V

The dv/dt filter plus VPL functionally consists of two components, the dv/dt reactor, and the voltage limiting network (VPL), which cuts-off voltage peaks and feeds the energy back to the DC link.

By using a dv/dt filter plus VPL, standard motors with standard insulation and without insulated bearings can be used with supply voltages up to 690 V in inverter operation.

dv/dt filters plus VPL are designed for the following maximum motor cable lengths:

- Shielded cables: 300m
- Unshielded cables: 450m

Note: This option changes the equipment dimensions (values upon request)

L13**Line contactor (for currents ≤ 800 A for single connection)**

Option L13 is required if a switching element is required for disconnecting the inverter from the input panel remotely (required for EMERGENCY OFF). The contactor is controlled and powered inside the panel itself.

For devices with rated input currents > 800 A in single connection, the function of option L13 is provided by option L26 or L29.

L15**Sine-wave filter**

The sine filter at the inverter output supplies almost perfect sinusoidal voltages to the motor so that standard motors can be used without special insulation and without insulated bearings. The sine-wave filter also reduces the inverter-related supplementary motor noise. The maximum permissible motor supply cable length is limited to 300 m.

Note: This option changes the equipment dimensions (values upon request)

L19**Connection for external auxiliary equipment**

With this option, an additional contactor is installed in the panel for a maximum current of 10 A for external auxiliary equipment (e.g. motor external fan with forced air cooling). The output contactor can be controlled internally in the inverter or externally (customer-specific).

The 3 AC supply voltage for the external auxiliary equipment is derived from the mains voltage and therefore corresponds to the rated value of the mains connection voltage.

Additional connection points are available for feedback contacts of the motor circuit breakers and the control contactor.

L21**Surge suppression (for operation in ungrounded networks)**

In ungrounded IT systems, it is recommended that a surge suppression be installed. The surge suppression option includes the installation of line-side surge arresters and upstream fuses for each system phase. The signaling contacts of the surge arresters are connected in series for the monitoring and connected to a customer interface.

L26

Main switch inclusive fuses or circuit breakers

A switch disconnecter with fuses is available as main switch for inverters in single connection with ratings up to 800 A. With currents above 800 A, a circuit breaker is used instead of a fuse disconnecter. The circuit-breaker is controlled and supplied within the panel.

For rated input currents < 1500 A, by selecting option L26, main switches including fuses are installed in addition to the line contactors provided as standard.

Option L26 is included as standard for inverters with power units connected in parallel and a rated input current of greater than 1500 A. Circuit breakers are installed in this case.

L57

Emergency OFF Category 0, 230 V AC or 24 V DC

E-STOP function category 0 for uncontrolled stopping according to EN 60204-1.

The function includes interrupting the power supply for the inverter via the line contactor and bypassing the microprocessor controller using a safety combination according to EN 60204-1.

The motor coasts to a standstill. When selected, the emergency button circuit is preset to 230 V AC. Jumpers must be appropriately set when using 24 V DC.

L59

Emergency Stop Function Category 1, 230 V AC

E-STOP function category 1 for controlled stopping according to EN 60204-1.

This function stops the inverter using a fast stop along a down ramp that is parameterized by the user. The power supply for the inverter is then interrupted as described for EMERGENCY OFF Category 0.

To maintain the specified stopping times, it may be necessary to use a braking unit.

L60

Emergency STOP Category 1, 24V DC

EMERGENCY STOP Category 1 for controlled stopping according to EN 60204-1.

The function stops the inverter using a fast stop along a down ramp that is parameterized by the user. The power supply to the inverter is then interrupted as described for EMERGENCY OFF Category 0.

To maintain the specified stopping times, it may be necessary to use a braking unit.

L61, L62

Braking units

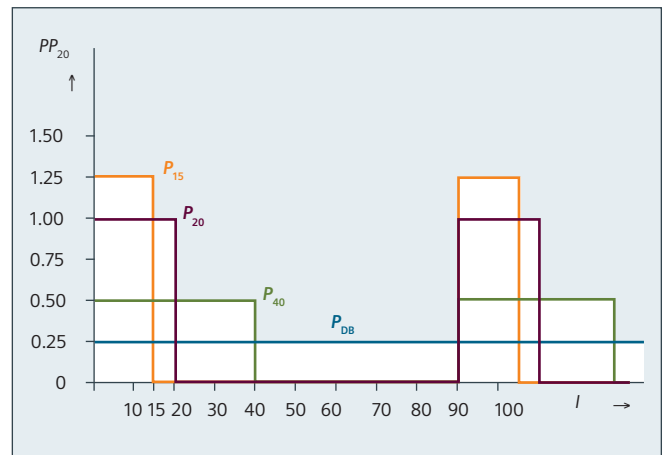
Braking units are used in drives in which motors might operate in generator mode, and the inverter does not have facility for feeding energy back into the supply system.

The braking unit comprises two components:

- The braking module, which is installed in the inverter cabinet;
- The braking resistor, which is mounted externally, with IP-20 protection degree.

The braking unit functions as an autonomous unit and does not require an external power supply. The braking energy is converted into heat in the braking resistor that must be mounted externally. The maximum cable length of 100 m is permissible between the Braking Module and the braking resistor

Braking unit characteristic curves



PDB = Braking Rated Power

P15 = 5 x PDB = Power which is permissible every 90 s for 15 s.
 P20 = 4 x PDB = Power which is permissible every 90 s for 20 s.
 P40 = 2 x PDB = Power which is permissible every 90 s for 40 s

It is also possible to increase the braking power of the drive by connecting more braking units in parallel (upon request).

L76**Quick start of LHF filter (L01)**

If the optional L01 (LHF harmonic filter) is in use, after the inverter has been switched off, as a result of the principle of operation, a waiting period of at least 30 seconds must be allowed to elapse before switching on again. With the option L76, the wait time is reduced to approx. 3 seconds.

L83**Thermistor protection unit with PTB approval (alarm)**

Thermistor motor protection device for PTC thermistors (PTC resistors, type A) for alarm. The thermistor motor protection device is supplied with power and evaluated internally the panel.

L84**PTC thermistor input (failure)**

Thermistor motor protection device for PTC thermistors (PTC resistors, type A) for trip. The thermistor motor protection device is supplied with power and evaluated internally the panel.

L86**PT-100 sensors for 6 sensors**

The Pt100 evaluation unit can monitor up to six sensors. The sensors can be connected using a two-wire or three-wire system.

The limit values can be freely programmed for each channel.

In the factory setting, the measuring channels are subdivided into two groups, each with three channels. With motors, for example, this means that three Pt100s in the stator windings and two Pt100s in the motor bearings can be monitored. Unused channels can be hidden via parameters.

The output relays are integrated into the internal fault and shutdown sequence of the inverter.

L87**Insulation monitoring**

An insulation monitor must be used if the inverter is connected to an ungrounded line supply. The device monitors the entire galvanically coupled circuit for insulation faults. An alarm is given in the event of a fault.

Note: Only one insulation monitor can be used in each galvanically coupled network.

M21**Degree of protection IP21**

When the M21 option is selected, this increases all Industry Cabinet units height by 300mm.

When M23, M43, or M54 options are selected, this increases all Industry Cabinet units height by 400mm.

For transportation reasons, the top cover is delivered separately, and must be fitted on site.

Attention: If there is no 230 V AC power supply in the plant, option K74 is essential to supply the fan of the FX and HX frames.

M23, M43, M54**Degree of protection IP23, IP43, IP54**

When the M21 option is selected, this increases all Industry Cabinet units height by 300mm.

When M23, M43, or M54 options are selected, this increases all Industry Cabinet units height by 400mm.

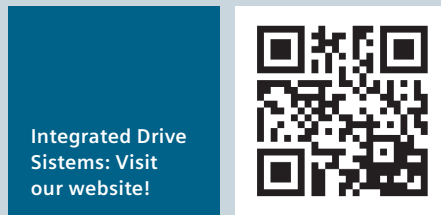
For transportation reasons, the top cover protections are delivered separately and must be fitted on site.

Attention: If there is no 230 V AC power supply in the plant, option K74 is essential to supply the fan of the FX and HX frames.

Learn more at:

[siemens.com/drives](https://www.siemens.com/drives)

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