



SINAMICS Drives

ROBICON W120 enclosed drive

1 HP to 200 HP

Introduction

This technical data sheet provides a short overview of the most important characteristics of the ROBICON W120 enclosed standard 6-pulse drive from Siemens, developed specifically to meet specifications in the municipal water and waste water market.

A result of the powerful combination of SINAMICS®, the most advanced drives technology platform, and the ROBICON legacy of more than 20 years of quality and expertise in the water and waste water industry, the W120 makes the best even better.

The ROBICON W120 is a stand-alone variable speed enclosed drive for non-regenerative single motor applications with variable or constant torque loads. This compact and quiet drive uses IGBT power semiconductors and an innovative cooling concept. The drive can be operated in either Volts/Hertz or sensorless vector control modes.

Standard features

The standard drive enclosure is either a wall mount box or a floor standing cabinet, which can be equipped with a wide variety of pre-engineered and custom options. The ROBICON W120 has the following standard features:

- NEMA 1 enclosure, with blowers (optional NEMA 12 ventilated with air filters)
- UL listing per UL508C
- Short circuit current rating (SCCR) 65 kA at 480 V AC
- Circuit breaker disconnect with flange mount operator handle, mechanically interlocked with the enclosure door
- Input line reactor
- Intelligent operator panel (IOP), door mounted for easy start-up and operation
- Windows based STARTER software – common to all models of the SINAMICS family

July 2015

Product Specifications

Light Overload		High Overload		Rated output current	Approx. max. input current ¹⁾	Power module frame size	ROBICON W120 enclosed drive
Output (at 460V, 60 Hz)	Base load current for 110% overload	Output (at 460V, 60 Hz)	Base load current for 150% overload				
HP	A	HP	A	A	A		
1	2.2	1	2.2	2.2	4.3	A	6SL3710-1BJ12-2ARO
1.5	3.1	1.5	3.1	3.1	5.2	A	6SL3710-1BJ13-1ARO
2	4.1	2	4.1	4.1	6.3	A	6SL3710-1BJ14-1ARO
3	5.9	3	5.9	5.9	8.1	B	6SL3710-1BJ16-0ARO
4	7.7	4	7.7	7.7	10	B	6SL3710-1BJ17-7ARO
5	10.2	5	10.2	10.2	12.4	B	6SL3710-1BJ21-0ARO
10	16	7.5	13.2	16	18.6	C	6SL3710-1BJ21-8ARO
15	22	10	19	22	25	C	6SL3710-1BJ22-5ARO
20	27	15	26	27	30	C	6SL3710-1BJ23-2ARO
25	34	20	32	34	38	D	6SL3710-1BJ23-8ARO
30	41	25	38	41	45	D	6SL3710-1BJ24-5ARO
40	54	30	45	54	59	D	6SL3710-1BJ26-0ARO
50	68	40	60	68	73	E	6SL3710-1BJ27-5ARO
60	80	50	75	80	86	E	6SL3710-1BJ29-0ARO
75	100	60	90	100	108	F	6SL3710-1BJ31-1ARO
100	130	75	110	130	138	F	6SL3710-1BJ31-5ARO
125	160	100	145	160	170	F	6SL3710-1BJ31-8ARO
150	186	125	178	186	194	F+	6SL3710-1BJ32-0ARO
200	240	150	205	240	249	F+	6SL3710-1BJ32-5ARO

1) The input current is based on the input current of the power module and includes an allowance of 2.0 A (≤ 60 HP) or 2.5 A (> 60 HP) for auxiliary circuits.

The standard ROBICON W120 base enclosed drive includes:

- NEMA 1 enclosure
- UL508C listing (file no. E319311)
- Short circuit current rating (SCCR) 65 kA at 480 V AC
- Power module PM240 (standard 6-pulse)
- Input line reactor
- Circuit breaker disconnect with mechanical door interlock
- Intelligent operator panel (IOP), door mounted and wired
- Integral braking chopper
- Cable entry top or bottom, line and motor side

Controller CU230P-2 HVAC with:

- RS485 serial communications port USS / Modbus RTU / BACnet MS/TP
- 6 digital inputs, 24V 15 mA, optically isolated (group)
- 3 relay outputs, 2x form C 250 VAC 2 A or 30VDC 5 A, 1x NO 30 VDC 0.5 A
- 4 analog inputs, 2x differential -10V to +10V or 0/4 to 20mA, 1x 0/4 to 20mA or temperature sensor, 1x temperature sensor input for Ni1000/Pt1000 sensor
- Input for temperature sensor KTY84, PTC thermistor or thermostat
- 2 analog outputs, 0 to +10V or 0/4mA to 20mA, 1x 0/4mA to 20mA, non-isolated

NOTE: Some of the control unit inputs and/or outputs may be used for options.

Standard Options

Option Code	Description	Option Code	Description
Enclosure Options ¹⁾		Control Options	
M12	NEMA 12 filters	E86	Isolation amplifier for one analog input
L50	Cabinet light and outlet	E87	Isolation amplifier for two analog outputs
L55	Cabinet space heaters (120VAC)	K20	Pilot lights (qty. 3), door mounted – Ready, Run, Fault
L56	Motor space heater supply	K21	Additional local controls (L-R & H-O-A, speed pot, Start/Stop p/b)
Y09	Special enclosure paint color [specify color]	K22	Elapsed time (hour) meter, door mounted, non-resettable
Power Circuit and Protection Options		L87	Ground fault monitor for ungrounded supplies (75 - 200 HP only)
L08	Output reactor	L97	RTD monitor for 8x Pt100 temperature sensors
L10 ²⁾	Output dV/dt filter	N55	ALL STOP mushroom pushbutton, latching, coast to stop
L13	Input isolation contactor	Communication Bus Options	
L15 ²⁾	Output sinusoidal filter	G81	PROFIBUS DP communication port
L24	5% input reactor	G82	EtherNet/IP or PROFINET communication port
L27	Input fuses	Other Options	
L28	Two contactor manual bypass (output/bypass contactors with o/l)	H20	Seismic certification per IBC 2012 (provide specification)
L29 ²⁾	Reduced voltage soft start (RVSS) manual bypass (75 - 200 HP only)		
L32	Output isolation contactor		
L63	Braking resistor		
L96	Input surge protective device		
L98	Motor thermal overload relay (already included in L28)		
L99	Motor protection relay (Multilin 369) (75 - 200 HP only)		
P10	Input voltage monitor (Siemens type 3UG4)		

¹⁾ For wall mount drives, enclosure options listed above are available only for the VFD enclosure itself. They are not available for the separate options enclosure.

²⁾ These options require a larger or additional enclosure as follows:

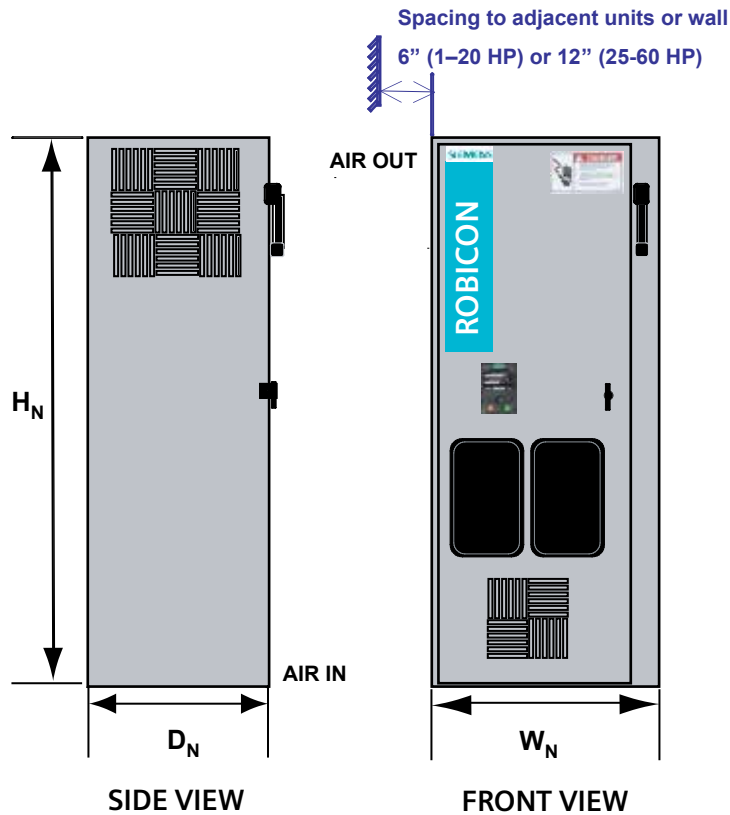
- For wall mount drives, these options are provided in separate, stand-alone options enclosures. The separate options enclosures are always provided as NEMA 1 only (also if the drive enclosure is ordered with option M12 NEMA 12 filters), color ANSI 61 grey.
- For floor standing drives, these options are provided in a larger enclosure (add-on options cabinet). Option M12 adds NEMA 12 filters to both the drives and attached add-on enclosures, and with option Y09 the complete enclosure will have the specified special paint color.

Options in the add-on or separate cabinet may be listed to UL508A.

Note: Please consult factory for additional/custom options.

Design Data – 1 to 60 HP

Wall Mount Drive Enclosure



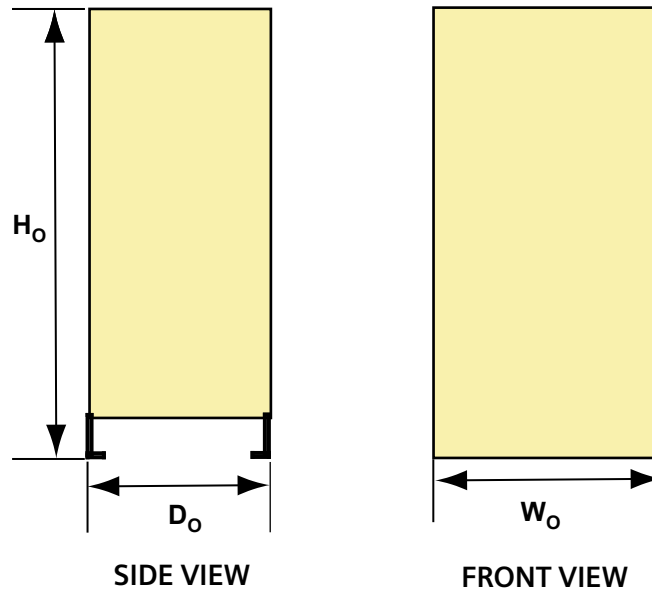
Notes:

- To assure proper air circulation, please allow minimum 6" (1–20 HP) respectively 12" (25–60 HP) space between adjacent wall mount drive enclosures or to a side wall.
- Dimensions are nominal for enclosure, tolerance 0.5" (12 mm), excluding protruding components. Please refer to drawings for exact details.

ROBICON W120 Enclosed drive	Output (Light Overload) (at 460V, 60 Hz)	Noise level LpA (1m) at 60 Hz	Cooling air flow demand	Heat loss	Weight approx.		Drive enclosure Nominal Size $W_N \times D_N \times H_N$	
Model No.	HP	dB (A)	cfm	kW	lb.	kg	inch	mm
Wall mount enclosure								
6SL3710-1BJ12-2AR0	1	64	77	0.14	230	104	20 x 16 x 48	508 x 440 x 1219
6SL3710-1BJ13-1AR0	1.5	64	77	0.15	230	104	20 x 16 x 48	508 x 440 x 1219
6SL3710-1BJ14-1AR0	2	64	77	0.15	230	104	20 x 16 x 48	508 x 440 x 1219
6SL3710-1BJ16-0AR0	3	64	115	0.18	230	104	20 x 16 x 48	508 x 440 x 1219
6SL3710-1BJ17-7AR0	4	64	115	0.19	230	104	20 x 16 x 48	508 x 440 x 1219
6SL3710-1BJ21-0AR0	5	64	115	0.24	230	104	20 x 16 x 48	508 x 440 x 1219
6SL3710-1BJ21-8AR0	10	64	182	0.38	230	104	20 x 16 x 48	508 x 440 x 1219
6SL3710-1BJ22-5AR0	15	64	182	0.44	230	104	20 x 16 x 48	508 x 440 x 1219
6SL3710-1BJ23-2AR0	20	64	182	0.47	230	104	20 x 16 x 48	508 x 440 x 1219
6SL3710-1BJ23-8AR0	25	67	318	0.58	330	150	26 x 20 x 60	660 x 508 x 1524
6SL3710-1BJ24-5AR0	30	67	318	0.68	330	150	26 x 20 x 60	660 x 508 x 1524
6SL3710-1BJ26-0AR0	40	67	318	0.85	330	150	26 x 20 x 60	660 x 508 x 1524
6SL3710-1BJ27-5AR0	50	67	360	1.27	330	150	26 x 20 x 60	660 x 508 x 1524
6SL3710-1BJ29-0AR0	60	67	360	1.49	330	150	26 x 20 x 60	660 x 508 x 1524

Design Data – Option enclosures for wall mount drives

Separate Options Enclosure (Floor Mount)



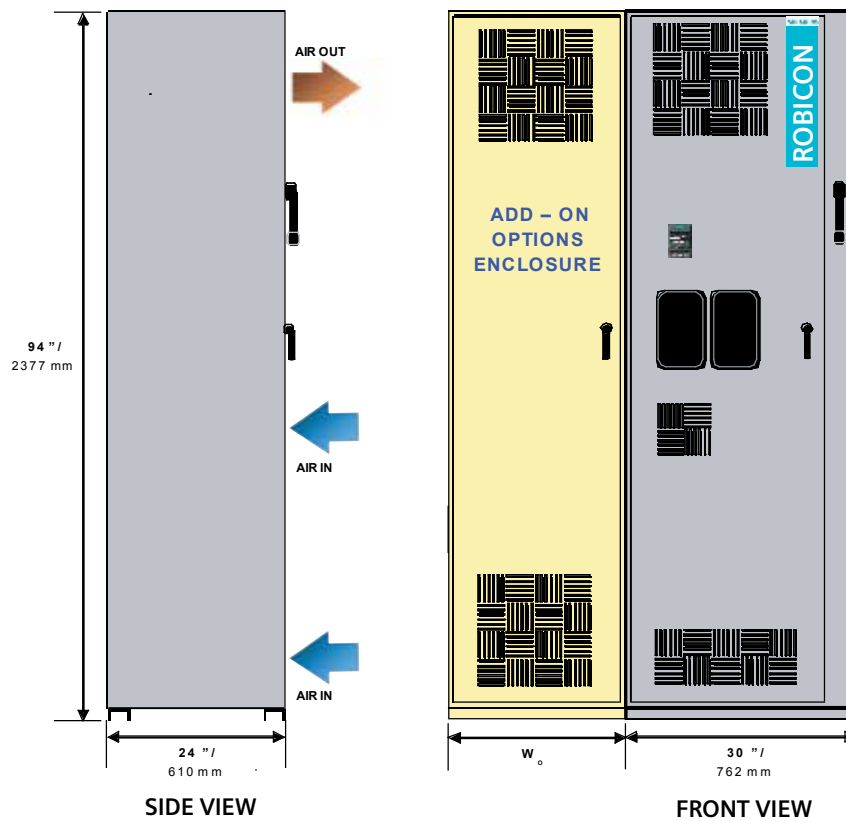
Notes:

- Dimensions are nominal for enclosure, tolerance 0.5" (12 mm), excluding protruding components. Please refer to drawings for exact details.
- These separate option enclosures are available as NEMA 1 only, color ANSI 61 grey.

ROBICON W120 Add-on options enclosure Enclosed drive	Output (Light Overload) (at 460V, 60 Hz)	Option enclosure L10 output dV/dt filter		Option enclosure L15 output sinusoidal filter	
		$W_o \times D_o \times H_o$ Inch / mm	Weight lb / kg	$W_o \times D_o \times H_o$ Inch / mm	Weight lb / kg
Floor standing enclosure					
6SL3710-1BJ12-2AR0	1	13 x 13 x 13 / 330 x 330 x 330	18 / 8	13 x 13 x 14 / 330 x 330 x 356	20 / 9
6SL3710-1BJ13-1AR0	1.5	13 x 13 x 13 / 330 x 330 x 330	18 / 8	13 x 13 x 14 / 330 x 330 x 356	21 / 10
6SL3710-1BJ14-1AR0	2	13 x 13 x 13 / 330 x 330 x 330	18 / 8	13 x 13 x 14 / 330 x 330 x 356	25 / 11
6SL3710-1BJ16-0AR0	3	13 x 13 x 13 / 330 x 330 x 330	18 / 8	13 x 13 x 14 / 330 x 330 x 356	25 / 11
6SL3710-1BJ17-7AR0	4	13 x 13 x 13 / 330 x 330 x 330	18 / 8	13 x 13 x 14 / 330 x 330 x 356	27 / 12
6SL3710-1BJ21-0AR0	5	13 x 13 x 13 / 330 x 330 x 330	18 / 8	13 x 13 x 14 / 330 x 330 x 356	27 / 12
6SL3710-1BJ21-8AR0	10	13 x 13 x 13 / 330 x 330 x 330	19 / 9	13 x 13 x 14 / 330 x 330 x 356	34 / 15
6SL3710-1BJ22-5AR0	15	13 x 13 x 13 / 330 x 330 x 330	22 / 10	17 x 17 x 24 / 432 x 432 x 610	79 / 36
6SL3710-1BJ23-2AR0	20	13 x 13 x 13 / 330 x 330 x 330	22 / 10	17 x 17 x 24 / 432 x 432 x 610	82 / 37
6SL3710-1BJ23-8AR0	25	13 x 13 x 13 / 330 x 330 x 330	24 / 11	17 x 17 x 24 / 432 x 432 x 610	86 / 39
6SL3710-1BJ24-5AR0	30	13 x 13 x 13 / 330 x 330 x 330	24 / 11	17 x 17 x 24 / 432 x 432 x 610	95 / 43
6SL3710-1BJ26-0AR0	40	13 x 13 x 13 / 330 x 330 x 330	32 / 15	17 x 17 x 24 / 432 x 432 x 610	101 / 46
6SL3710-1BJ27-5AR0	50	13 x 13 x 13 / 330 x 330 x 330	40 / 18	18 x 21 x 34 / 457 x 533 x 864	136 / 62
6SL3710-1BJ29-0AR0	60	13 x 13 x 13 / 330 x 330 x 330	40 / 18	18 x 21 x 34 / 457 x 533 x 864	147 / 67

Design Data – 75 to 200 HP

Floor Standing Enclosure



Notes:

- Dimensions are nominal for enclosure, tolerance 0.5" (12 mm), excluding protruding components. Please refer to drawings for exact details.

ROBICON W120 Enclosed drive	Output (Light Overload) (at 460V, 60 Hz)	Noise level L_{pA} (1m) at 60 Hz	Cooling air flow demand	Heat loss	Weight approx.	Drive enclosure Nominal size $W_N \times D_N \times H_N$
Model No.	HP	dB(A)	cfm	kW	lb kg	inch mm
Floor standing enclosure						
6SL3710-1BJ31-1AR0	75	69	504	1.90	720 327	30 x 24 x 94 762 x 610 x 2377
6SL3710-1BJ31-5AR0	100	69	504	2.40	720 327	30 x 24 x 94 762 x 610 x 2377
6SL3710-1BJ31-8AR0	125	69	504	2.80	720 327	30 x 24 x 94 762 x 610 x 2377
6SL3710-1BJ32-0AR0	150	69	504	2.83	760 345	30 x 24 x 94 762 x 610 x 2377
6SL3710-1BJ32-5AR0	200	69	504	2.93	760 345	30 x 24 x 94 762 x 610 x 2377

Add-on options enclosure	Output (Light Overload) (at 460V, 60 Hz)	Option enclosure L10 output dV/dt filter		Option enclosure L15 output sinusoidal filter		Option enclosure L29 RVSS bypass	
		Width W_o	Weight	Width W_o	Weight	Width W_o	Weight
Model No.	HP	Inch / mm	lb / kg	Inch / mm	lb / kg	Inch / mm	lb / kg
Floor standing enclosure							
6SL3710-1BJ31-1AR0	75	20 / 508	450 / 205	20 / 508	440 / 200	20 / 508	463 / 210
6SL3710-1BJ31-5AR0	100	20 / 508	450 / 205	20 / 508	440 / 200	20 / 508	463 / 210
6SL3710-1BJ31-8AR0	125	20 / 508	450 / 205	20 / 508	440 / 200	20 / 508	463 / 210
6SL3710-1BJ32-0AR0	150	20 / 508	450 / 205	24 / 610	660 / 300	20 / 508	463 / 210
6SL3710-1BJ32-5AR0	200	20 / 508	450 / 205	24 / 610	660 / 300	20 / 508	463 / 210

Technical Data

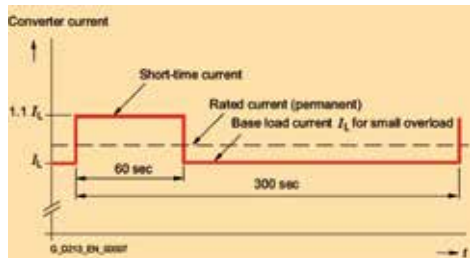
Electrical data				
Supply voltages and output ranges	460 V to 480 V 3 ph AC, ±10%, 1 to 200 HP			
Supply systems	Grounded or ungrounded supplies			
Line frequency	47 Hz to 63 Hz			
Output frequency	0 Hz to 266 Hz (550 Hz with derating)			
Power factor fundamental approx.	0.95			
Drive efficiency	93 to 97%			
Short circuit current rating	SCCR 65kA			
Control method	V/Hz control, V/Hz with flux current control (FCC), sensorless vector control (SVC).			
Fixed speeds	16 fixed frequencies			
Skipped frequency ranges	4, programmable			
Braking operation	Integral brake chopper for dynamic braking			
Mechanical data				
Type of enclosure and color	NEMA 1, optionally NEMA12 (ventilated), ANSI 61 gray			
Type of cooling	Forced air ventilation			
Noise level L _{pA} (1 m)	64 to 69 dB(A) at 60 Hz line frequency			
Environmental protection	Nickel plated busbars, varnish coated electronic boards			
Compliance with standards				
UL listing	Listed to UL508C, file no. E319311			
Ambient conditions		Operation	Storage	Transport
Ambient temperature		32°F to 104°F (0°C to +40°C) Up to +122°F/+50°C with derating	-13°F (-25°C) to 131°F (+55°C)	-13°F (-25°C) to 158°F (+70°C) Down to -40°F (-40 °C) for 24 hours
Relative humidity (non-condensing)		5% to 95%	5% to 95%	5% to 95% at 40°C
Installation altitude		Up to 3,300 ft (1000 m) above sea level without reduction in performance, > 3,300 ft see derating data		

Engineering Information

Overload ratings

The ROBICON W120 drive may be operated with both variable torque and constant torque loads at either light or high overload duties. The criterion for overload is that the drive is operated with its base load current before and after the overload occurs.

Light overload duty is based on 110% base load current for 60 sec or 150% for 3 sec, repeated every 300 sec.



Light overload

High overload duty is based on 150% base load current for 60 sec or 200% (<125 HP) or 175% (125 & 150 HP) for 3 sec, repeated every 300 sec.

Motor and drive sizing

Service Factor must be considered for motors operating at Service Factors beyond 1.0. Please consult factory for assistance sizing the drive.

For motors with ratings larger than the drive, please consult factory as nuisance tripping may occur if drive is not properly sized.

In sensorless vector control, the rated motor current (FLA) must be at least 1/4 of the rated drive output current. With lower motor currents, operation is possible in Volts/Hz control mode only.

Intelligent operator panel (IOP)

The SINAMICS IOP makes it easy to operate, commission and diagnose faults on the drive. Up to two process values can be displayed on the screen either graphically or numerically. Process values can be displayed in the appropriate technological units. The user language can be selected.

Due to the large plain text display, menu prompting and application wizards, commissioning of drives is very quick.



Parameters are displayed in plain text, explanatory help texts are provided and there is a parameter filter function. The user is interactively navigated through commissioning of common applications such as pumps, fans, compressors and conveyors using application wizards.

The IOP has a dedicated key to toggle between local (from IOP) and remote control.

Fault diagnosis is in a user-friendly fashion using plain text display of faults and alarms. Explanatory help texts are provided by pressing the INFO key.

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