

# SINAMICS V20

... the cost-effective, reliable and easy-to-use inverter for basic applications



## SINAMICS V20



- **Introduction**
- Product
- Functions
- Communication
- Commissioning
- Tools
- Customer benefits
- Applications Support
- Summary

## SINAMICS V20 – Making the choice easy for you



- *Easy to install*
- *Easy to use*
- *Easy to save money*

### SINAMICS V20

The cost-effective, reliable and easy-to-use inverter for basic applications

## Field of applications

Field of applications	Performance <sup>*)</sup>	Continuous motion			Discontinuous motion		
	Purpose	Basic	Medium	High	Basic	Medium	High
Pumping/ ventilating/ compressing	Centrifugal pumps Radial/axial fans Compressors		Eccentric spiral/ worm/screw pumps	Hydraulic pumps Dosing pumps		Descaling pumps Hydraulic pumps	
Moving	Belt conveyors Roller conveyors Chain conveyors	Belt conveyors Roller conveyors Chain conveyors Vertical/horizontal material handling Elevators/escalators Gantry cranes Ship's drives Cable railways	Elevators Container cranes Mine hoists Open cast mine excavators Test stands	Accelerating conveyors Rack feeders	Accelerating conveyors Rack feeders Cross cutters Roll changers	Rack feeders Robotics Pick & Place Indexing tables Cross cutters Roller feeds Engaging/disengaging	
Processing	Mills Mixers Kneaders Crushers Agitators Centrifuges <b>V20</b>	Mills Mixers Kneaders Crushers Agitators Centrifuges Extruders Rotary furnaces	Extruders Winders/unwinders Leading/following drives Calenders Mechanical presses Printing machines	Tubular bagging machines Single axis motion control i.e. • positioning profiles • path profiles		Servo presses Rolling mill drives Coordinated multi-axis motion control i.e. • Multi-axis positioning • Cam discs • Interpolation	
Machining	Main Drives i.e. • Turning • Milling • Drilling	Main Drives i.e. • Drilling • Sawing	Main Drives i.e. • Turning • Milling • Drilling • Gear cutting • Grinding	Axis Drives i.e. • Turning • Milling • Drilling	Axis Drives i.e. • Drilling • Sawing	Axis Drives i.e. • Turning • Milling • Drilling • Laser machining • Gear cutting • Grinding • Nibbling and Punching	

\*) Requirements regarding torque precision / speed precision / positioning precision / axis coordination / functionality

## Fields of application and product positioning

Field of application

SINAMICS Selection aid – typical applications

Performance <sup>*)</sup>	Continuous motion			Discontinuous motion		
	Basic	Medium	High	Basic	Medium	High
Purpose						
Pumping/ ventilating/ compressing	V20 G110 G120C G130/G150 GL/GM150	G120P G120C, G120 G130/G150 GL/GM150	S120	S110	S110 S120	S120 GM150
Moving	V20 G110 G110D G120C G130/G150 GM150	G120D G120C G120 G130/G150 DCM S120/S150 GM/GL/SM150	S120 S150 SM/SL150 GM150 DCM	G120D S110	S110 S120 DCM	S120 DCM
Processing	V20 G120C G130/G150 GM150	G120C G120 G130/G150 S150 GM/GL150 DCM	S120 S150 DCM	S110	S110 S120	S120 SM/SL150 DCM
Machining	S110	S110 S120	S120	S110	S110 S120	S120

V20

<sup>\*)</sup> Requirements regarding torque precision / speed precision / positioning precision / axis coordination / functionality

## SINAMICS V20



- Introduction
- **Product**
- Functions
- Communication
- Commissioning
- Tools
- Customer benefits
- Applications Support
- Summary

## Siemens Numerical Control Ltd., Nanjing (SNC)



SNC is a top ranking supplier for machine tool systems and factory automation

- Numerical Control Systems
- HMI's
- Drives
- PLC's

Development and production of SINAMICS V20



Zero-Defect Culture and continuous improvement for perfect quality

## Production of Motion Control products

Surface Mounting



Wave Soldering



PCB Testing



Coating & Glue



Modern Production Lines

Integrated Testing

Well Trained Work Force

Packing



Out-of-Box test



Module test



Module Assembly





## SINAMICS V20 Overview



**Power Range:** 0.12 kW – 15kW  
**Voltage Range:** 1AC 230V / 3AC 400V  
**Control Mode:** V/f , V<sup>2</sup>/f , FCC

### Easy to install

- Push-through and wall mounting possible in parallel
- USS and MODBUS RTU on terminals
- Integrated braking chopper from 7.5kW

### Easy to use

- Parameter loading without power supply
- Application and connection macros for quick commissioning
- “Keep running mode” for uninterrupted operation also with unstable power supply
- Wider voltage range, advanced cooling design and coated PCBs and electronic components increase the robustness

### Easy to save money

- ECO mode with automatic flow reduction with U/f, U2/f
- Hibernation mode to reduce the energy consumption in standby mode
- Energy consumption display

## Dimensions

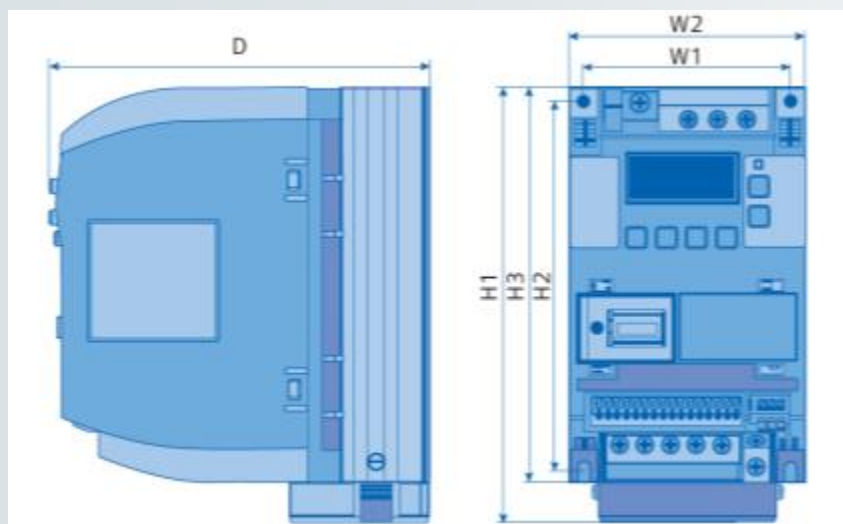


FSA

FSB

FSC

FSD



Frame size	Width [mm]		Height [mm]			Depth [mm] D	Weight* [kg]
	W1	W2	H1	H2	H3		
<b>FSA</b>	90	79	166	140	150	145.5	1.05
<b>FSB</b>	140	127	160	135	-	164.5	1.8
<b>FSC</b>	184	170	182	140	-	169	2.6
<b>FSD</b>	240	223	206.5	166	-	172.5	4.3

\* with integrated line filter

# Technical specifications

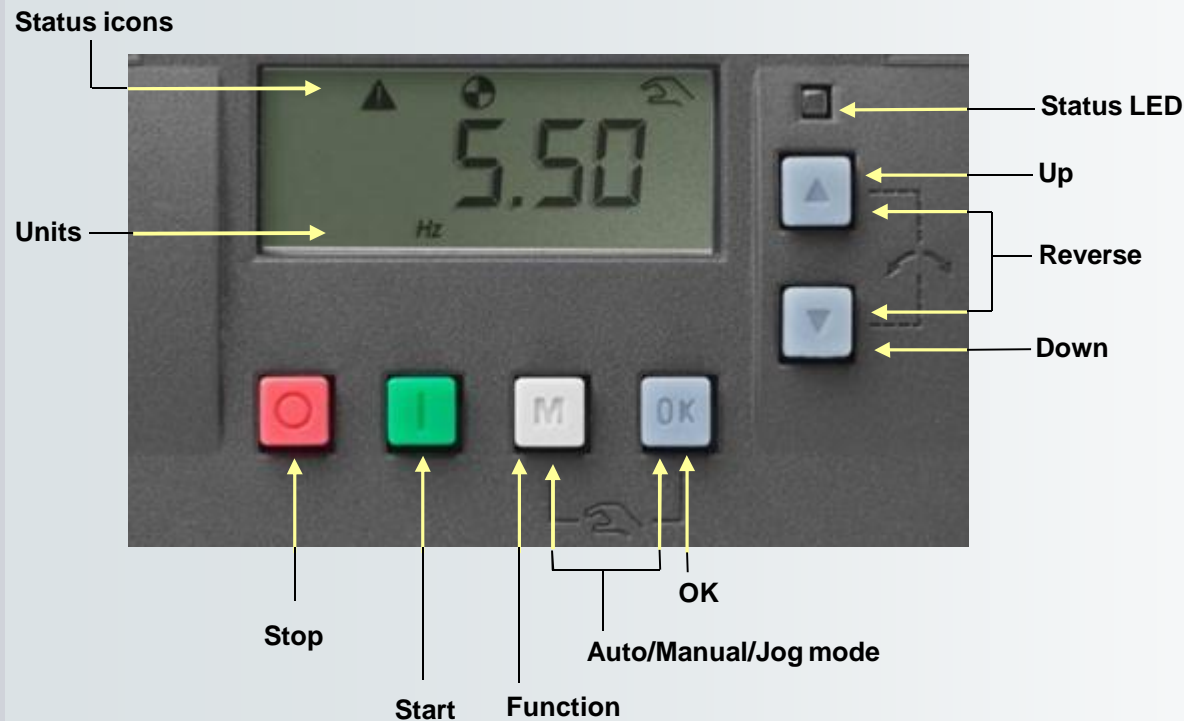
Power and Control	
Voltage	3AC 380V ... 480V (-15% ... +10%) 1AC 200V ... 240V (-10% ... +10%)
Input frequency	50/60 Hz
Supply network	TN, TT, IT, TT earthed line
Power range	3AC 400V 0.37... 15.0 kW 1AC 230V 0.12...3.0 kW
Overload	150% rated output current for 60 s
Output frequency	0.. 599 Hz resolution: 0.01 Hz
Pulse frequency	2...16 kHz
Control methods	Linear V/F, quadratic V/F, multi-point V/F, flux current control

Signal inputs and outputs	
Analog inputs	AI1: bipolar current / voltage mode AI2: unipolar current / voltage mode Can be used as digital inputs
Analog outputs	AO: 0...20mA
Digital inputs	DI1-DI4, optically isolated PNP/NPN selectable by terminal
Digital outputs	<ul style="list-style-type: none"> <li>▪ DO1: transistor output</li> <li>▪ DO2: relay output</li> <li>▪ 250 V AC 0.5 A with inductive load</li> <li>▪ 30 V DC 0.5 A with ohmic load</li> </ul>

Standards	
Standards	CE, cULus, c-Tick, KC
EMC standards	3AC 400V EN 61800-3 Category C3: ESD, Radiated immunity, Burst, Surge, Conducted immunity, Voltage distortion immunity  1AC 230V EN 61800-3 Category C2 Conducted Emissions, Radiated Emissions

Mounting and environment	
Degree of protection	IP20
Mounting	Wall-mounting with side-by-side push-through mounting for FSB, C and D
Cooling	<ul style="list-style-type: none"> <li>▪ FSA less than 1.1kW: natural cooling.</li> <li>▪ FSA, FSB, FSC, FSD: cooling of power electronics via heat sinks with external fan</li> </ul>
Ambient temperature	<ul style="list-style-type: none"> <li>▪ Operation: 0...+60 °C (32...140 °F) ; 40...60°C(104...40°F) with derating</li> <li>▪ Storage: -40 ... + 70 °C (-40 ... 158°F)</li> </ul>
Relative humidity	95 % (non-condensing)
Altitude	<ul style="list-style-type: none"> <li>▪ Up to 4000m above sea level</li> <li>▪ 1000... 4000 m: output current derating</li> <li>▪ 2000 ... 4000 m: input voltage derating</li> </ul>
Motor cable length	<ul style="list-style-type: none"> <li>▪ Unshielded cable: 50m</li> <li>▪ Shielded cable: 25m; 10m for FSA filtered version.</li> </ul>
Dynamic braking	Option for FSA, FSB and FSC; integrated for FSD

## Integrated Basic Operating Panel (BOP)



- Full control of the motor via the integrated BOP
- Easy menu structure for quick commissioning
- The LED shows directly the actual inverter status
- Graphical display
- Values and Units
- Status icons
- The international layout can be easily operated by users from every country

## External BOP

Use the external BOP and be more flexible in operating SINAMICS V20 ...

- Remote control on the inverter via ext. BOP, e.g. door connection.
- The BOP interface with SD/MCC slot can also be used for parameter loading, storing or cloning



Convenient and intuitive navigation with wheel control

The drive can be conveniently operated from outside the cabinet

Simple installation on the cabinet door



Interface with SD/MCC slot for parameter cloning

3 m

## Options

### Braking module



- Shortens the deceleration ramp time
- Suitable for 1 AC 230 V and 3 AC 400 V
- Duty cycle adjustable from 5 % to 100 %
- FSD devices with integrated braking unit

### External BOP (Basic Operator Panel)

#### V20 BOP:

- Same functions as the integrated BOP
- The values and setpoints are changed by rotating the wheel



#### BOP cable:

- 3 m cable with connectors

#### BOP interface:

- Connection between inverter and ext. BOP
- Integrated SD/MMC card slot for parameter loading / storing / cloning



### Parameter loader



- Loading and storing resp. cloning of parameter sets
- The converter need not be connected to the power supply
- Max. 100 parameters sets can be managed on one memory card

## Options

### Braking resistor

- Dissipates regenerative energy as heat
- Graduated for FSA, ..., D



### Line filter

- FSA, .. , D
- To implement EMC-conforming installations



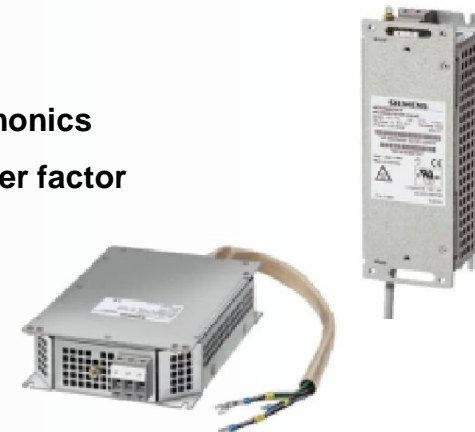
### Output reactors

- Allow longer motor cables



### Line reactor

- Reduction of harmonics
- Improves the power factor



## Options

### Memory card

- MMC or SIMATIC SD Memory card



### RS-485 Terminator

- Bus terminator for stable Modbus and USS communication

### Shield connection kit

- Optimum shield connection
- Strain relief

### Replacement fan

- FSA, FSB, FSC & FSD





## Packaging

### Compact inverter ... ... compact package

Frame size	Width [mm]	Height [mm]	Depth [mm]
FSA	143	218	198
FSB	203	223	226
FSC	262	260	242
FSD	318	286	252



### Save transport and storage

Cushioning material absorbs impacts and strengthens the box to resist transportation under rough condition

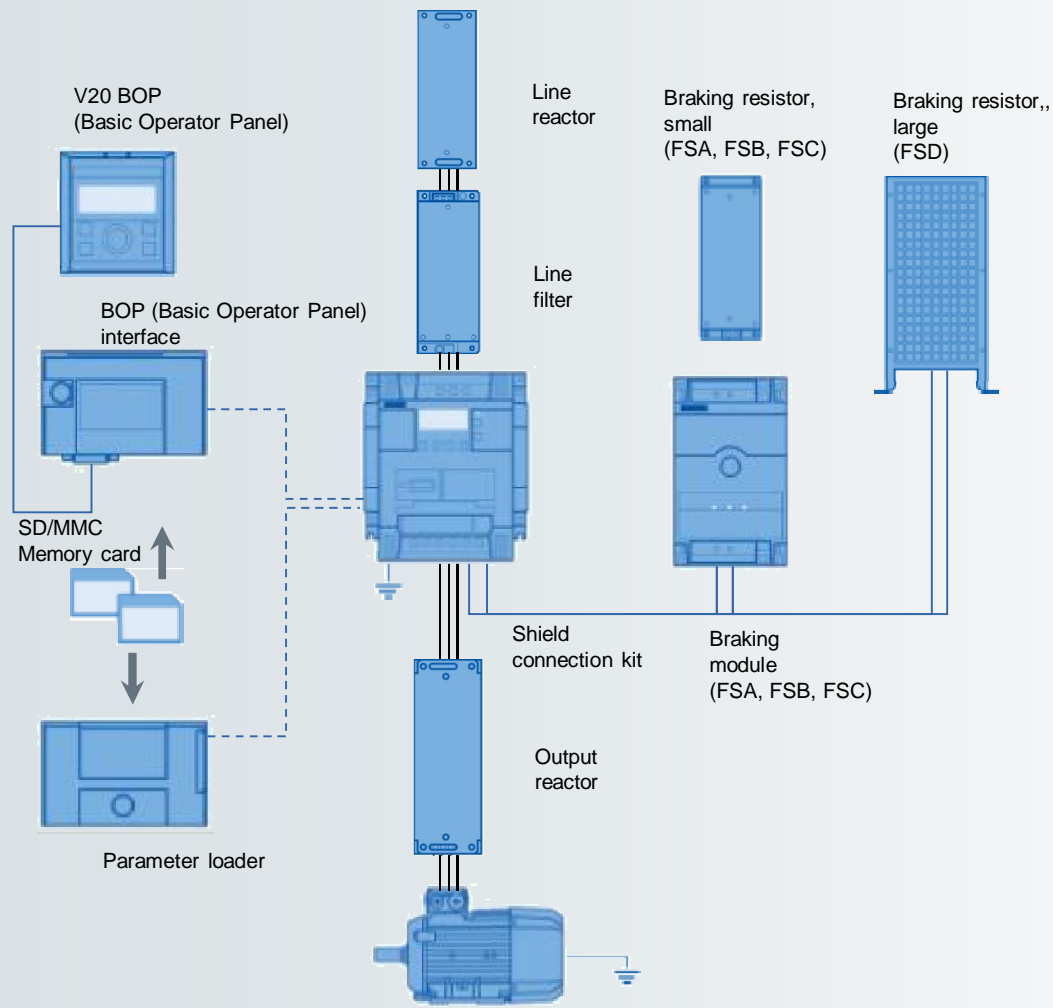


### Delivery includes ...

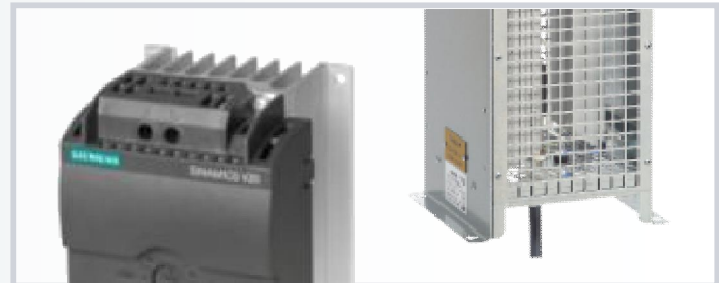
- **SINAMICS V20**
- **Getting started guide**
- **Certificate**
- **Software licenses**



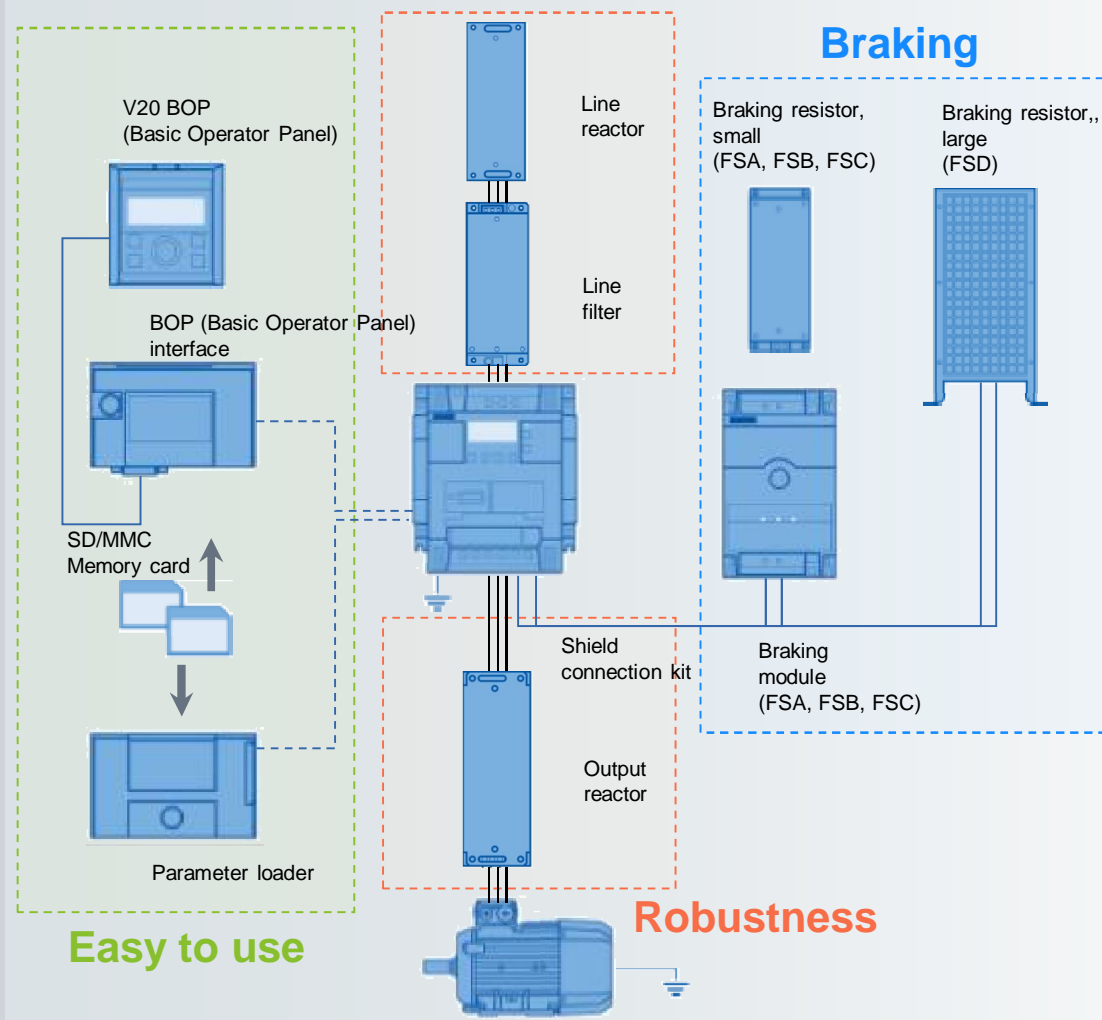
## System overview



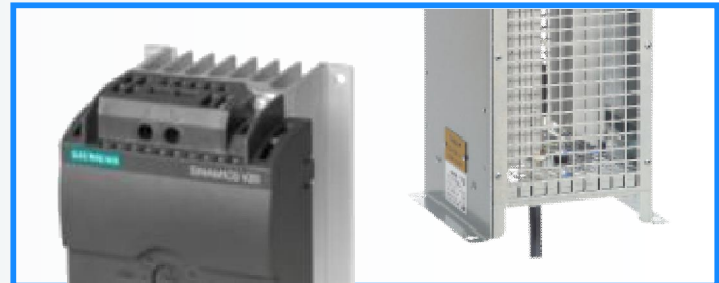
## Comprehensive options...



## System overview



## Comprehensive options...



## SINAMICS V20



- Introduction
- Product
- **Functions**
- Communication
- Commissioning
- Tools
- Customer benefits
- Applications Support
- Summary

## Features and functions

### Application

- ID controller
- BICO function
- Hammer start
- Super torque mode
- Blockage clearing mode
- Motor staging
- Flexible boost control
- Wobble function
- Slip compensation
- Dual ramp
- Adjustable PWM modulation

### Energy saving

- ECO mode
- Hibernation mode
- Energy consumption monitoring

### Ease of use

- Connection and application macro
- Parameter cloning
- Keep Running Mode
- USS/MODBUS RTU communication
- Customized default value
- Automatic restart
- Flying start
- DC-link voltage control
- I<sub>max</sub> control

### Protection

- Frost protection
- Condensation protection
- Cavitation protection
- Kinetic buffering
- Load failure detection

## SINAMICS V20



- Introduction
- Product
- Functions
- **Communication**
- Commissioning
- Tools
- Customer benefits
- Applications Support
- Summary

## Communication



### User terminal

- 2 analog inputs
- 1 analog output
- 4 digital inputs
- 2 digital outputs

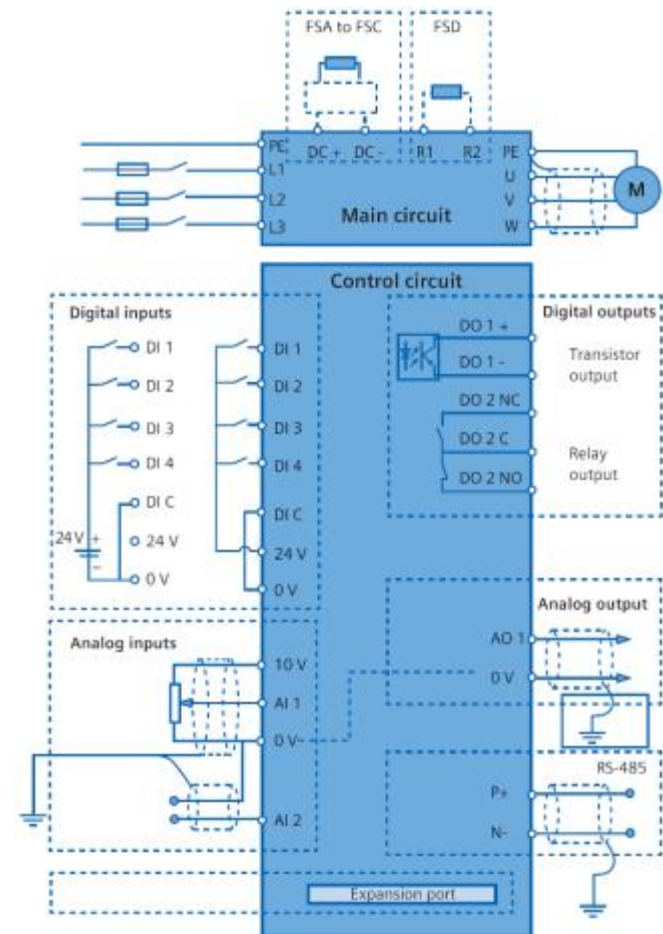
### Easy to use terminal

- Simply plug in, no special tool required
- The terminal designations are engraved

### Communication.

- Integrated communication interface for USS and MODBUS RTU, additional modules are not required.
- Setpoints can also be specified via the analog input
- Integrated communication macros
- The automation system can be conveniently set up via the standardized libraries in the PLC

### Wiring diagram



## Communication

### USS® - Protocol

**The USS® protocol is a simple serial data transfer protocol for the drives technology defined by Siemens AG.**

**Major features of the USS® protocol are:**

- Support of a multi-point-capable coupling, e.g. EIA RS 485-Hardware, or point to point coupling e.g. EIA RS 232
- Master slave access technique, single master system, maximum 32 nodes (31 slaves)
- Baud rate 2,4 – 187,5kbit/s
- Cable length maximum 1200m (3300ft)
- Operation with either variable or fixed telegram lengths
- Same bus physic as PROFIBUS (DIN 19245 Teil 1)
- Data interface to the basic unit according profile “Variable Speed Drives”. Information to the drive with USS® protocol are transmitted the same way as PROFIBUS-DP

**The USS® protocol can be implemented on industrial controller and on PC's. SIMATIC S7 200 and S7 1200 support the protocol as standard. Building automation systems Desigo PX with additional I/O module have implemented the protocol as well.**

**Further information:**

<http://support.automation.siemens.com/WW/view/en/24178253>



# Communication

## Modbus RTU

**Modbus is a serial communications protocol published by Modicon in 1979 for use with its programmable logic controllers (PLCs). The Modbus protocol is a communication protocol based on a Master-Slave or Client/Server architecture. The main reasons for the extensive use of Modbus in the industrial environment are:**

- It has been developed with industrial applications in mind
- It is openly published and royalty-free
- It is easy to deploy and maintain
- It moves raw bits or words without placing many restrictions on vendors

**Modbus RTU (Remote Terminal Unit) is the most common implementation available for Modbus. It transmits data in serial communication and makes use of a compact, binary representation of the data for protocol communication.**

- Support of a multi-point-capable coupling, e.g. EIA RS 485-Hardware, or point to point coupling e.g. EIA RS 232
- Master slave access technique, single master system, maximum 247 slaves
- Baud rate 4,8 – 187,5kbit/s
- Cable length maximum 1200m (3300ft)
- Since the Modbus protocol can only handle register or bit numbers for addressing the memory, assignment to the appropriate control words, status words and parameters is performed on the slave side.

## SINAMICS V20

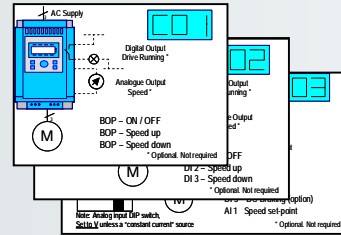


- Introduction
- Product
- Functions
- Communication
- **Commissioning**
- Tools
- Customer benefits
- Applications Support
- Summary

# SINAMICS V20 – Easy to set up, easy to use



Power on



1

Confirm / change  
motor data

2

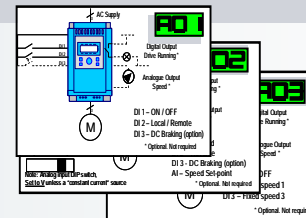
Select  
connection macro

3

Select  
application macro

4

General  
parameter  
settings



Start motor

Macro-based commissioning of the V20 – with a few steps from the first startup through to the running motor

# SINAMICS V20 – fast and convenient commissioning



1 Confirm / change motor data

Press:



Parameter settings



P1900 Motor data identification

7

1



P0100 Frequency selection

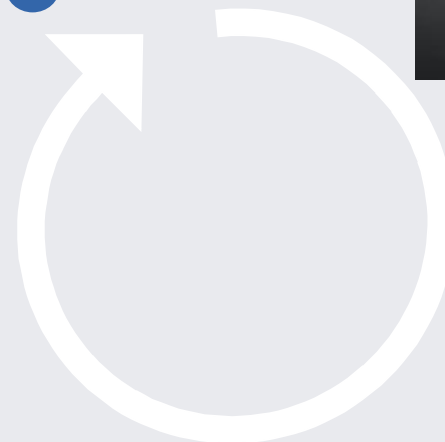


Confirm with



P0311 Rated motor speed

6

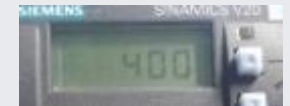


P0308 COS

5

2

P0304 Motor voltage

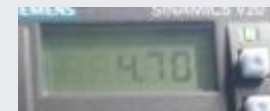


P0307 Selection of the motor power

4

3

P0305 Set motor current



# SINAMICS V20 – fast and convenient commissioning



2

Select connection macro

Press:



Parameter settings

Connection macro	Description	Display example
Cn000	Factory default setting. Makes no parameter changes.	
Cn001	BOP as the only control source	-Cn000
Cn002	Control from terminals (PNP / NPN)	
Cn003	Fixed speeds	Cn001
Cn004	Fixed speed binary mode	
Cn005	Analog input and fixed frequency	
Cn006	External push button control	
Cn007	External push button with analog setpoint	
Cn008	PID control with analog input reference	
Cn009	PID control with the fixed value reference	
Cn010	USS control	
Cn011	MODBUS RTU control	

The minus sign indicates that this macro is the currently selected macro.

Selection of the connection macros

E.g. Cn010  
USS controller



Cn001  
BOP as single control source



Minus shows the current macro selection

# SINAMICS V20 – fast and convenient commissioning



3

Select  
Application macro

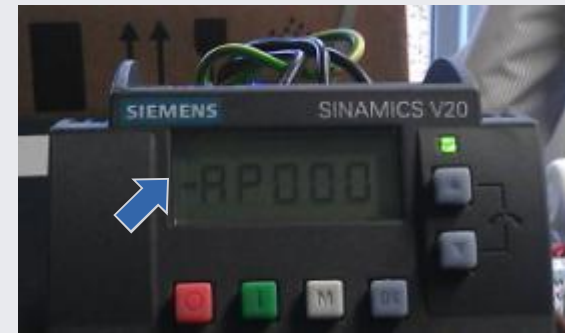
Press:



Parameter  
settings

Application macro	Description	Display example
AP000	Factory default setting. Makes no parameter changes.	
AP010	Simple pump applications	<b>-AP010</b>
AP020	Simple fan applications	
AP021	Compressor applications	<b>AP021</b>
AP030	Conveyor applications	

The minus sign indicates that this macro is the currently selected macro.



AP000  
No parameter change



Selection of the application macro

E.g. AP010  
Pump application

# SINAMICS V20 – fast and convenient commissioning



4

General parameter settings

Press:



Parameter settings

Parameter	Access level	Function	Text menu (if P8553 = 1)
P1080[0]	1	Minimum motor frequency	$n_{nr} P n$ (MN RPM)
P1082[0]	1	Maximum motor frequency	$n_{Hr} P n$ (MX RPM)
P1120[0]	1	Ramp-up time	$r n P U P$ (RMP UP)
P1121[0]	1	Ramp-down time	$r n P d n$ (RMP DN)
P1058[0]	2	JOG frequency	$J o g P$

Selection of the application macro

E.g. P1120  
Set ramp-up time



**P2248**  
Ramp-down time motor potentiometer  
Technology controller



## SINAMICS V20



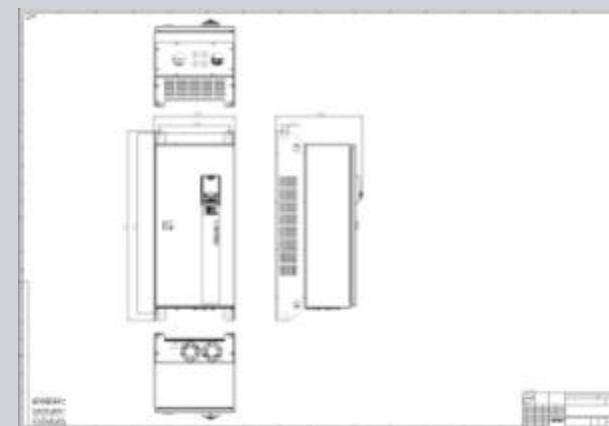
- Introduction
- Product
- Functions
- Communication
- Commissioning
- **Tools**
- Customer benefits
- Applications Support
- Summary



## DT Configurator

### Configuration

- Selection of drives based on the application matrix even without any experts knowledge
- Delivery of optimized SINAMICS drives suitable to requirements
- 2D/3D-Modells, operating instructions, data sheets
- Support for the following Order process
- [https://eb.automation.siemens.com/goos/catalog/Pages/ProductData.aspx?regionUrl=/de&language=de&tree=CatalogTree&nodeid=10028832&autoOpenConfigId=10&kmat=DT\\_M#topAnch](https://eb.automation.siemens.com/goos/catalog/Pages/ProductData.aspx?regionUrl=/de&language=de&tree=CatalogTree&nodeid=10028832&autoOpenConfigId=10&kmat=DT_M#topAnch)

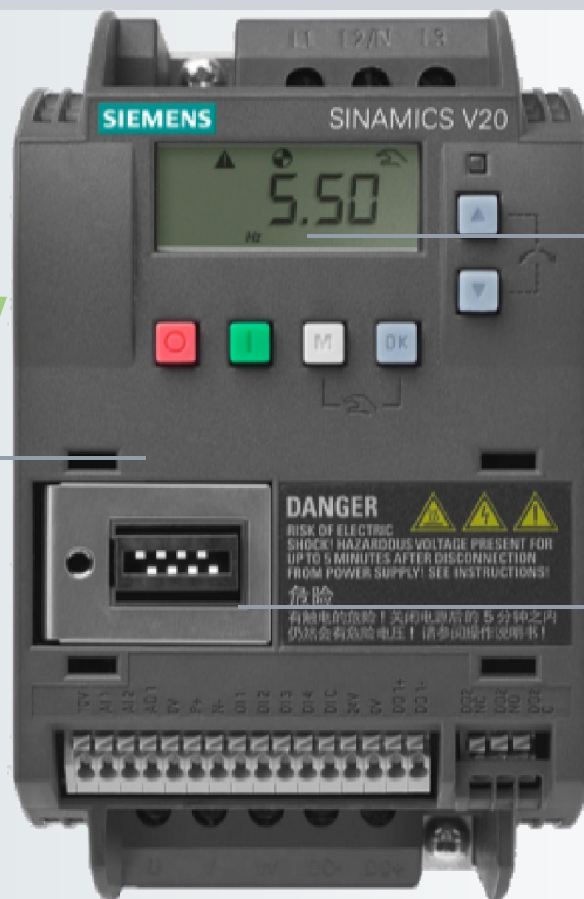


## SINAMICS V20



- Introduction
- Product
- Functions
- Communication
- Commissioning
- Tools
- **Customer benefits**
- Applications Support
- Summary

# SINAMICS V20 – Easy to install, easy to use and easy to save money!



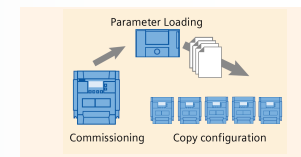
## Energy efficiency

### Easy to SAVE MONEY

The energy consumption is significantly reduced thanks to the energy-saving functions.



### Easy to USE



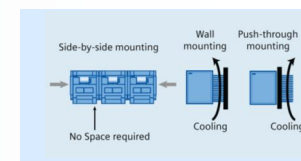
Macro-based commissioning and development for operation in harsh environments.

## Productivity

### Easy to INSTALL

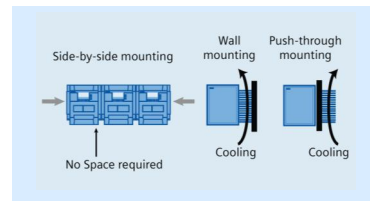
Flexibility and easy integration in existing systems.

## Compact



The cost-effective, reliable and easy to use inverter for basic applications

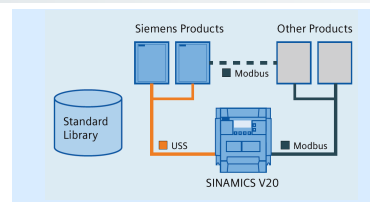
## Easy to install



### Installation

Side-by-side, push-through and wall mounting.

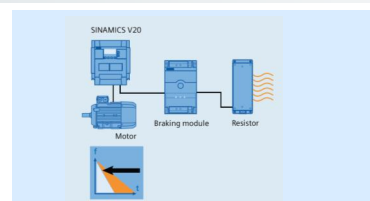
**Compact** design and **flexible** installation.



### Communication

USS and Modbus RTU selectable.

**Easy integration** in existing systems. Connection macros and standard libraries support commissioning.



### Braking module

Possible to use dynamic braking to **increase the braking performance**. Simply connect the braking resistor to the **built-in** braking module ( $\geq 7.5$  kWh).

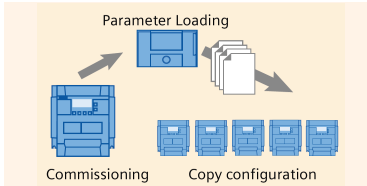
**Flexibility and easy integration in existing systems.**

## Easy to use



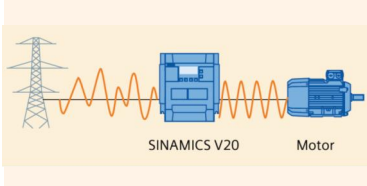
### Macro approach

Optimized application settings for **quick commissioning**.



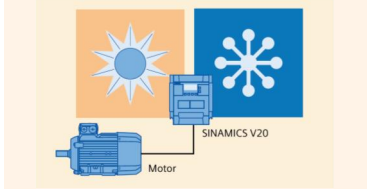
### Parameter cloning

**Easy transfer** of parameter settings from one inverter to another.



### Keep Running Mode

**Higher productivity** in production by automatic adjustment in the case of unstable line supplies.



### Robustness

Wider voltage range, improved cooling design and coated PCBs **increase the robustness** of the drive.

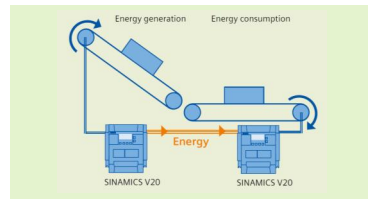
**Macro-based commissioning and robustness for operation in harsh environments.**

## Easy to save money



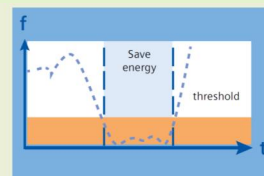
### ECO Mode

Machine **setting** according to the relevant application and adjustment of the current flow to **save energy**.



### DC coupling

**Re-use** regenerative energy across multiple inverters.

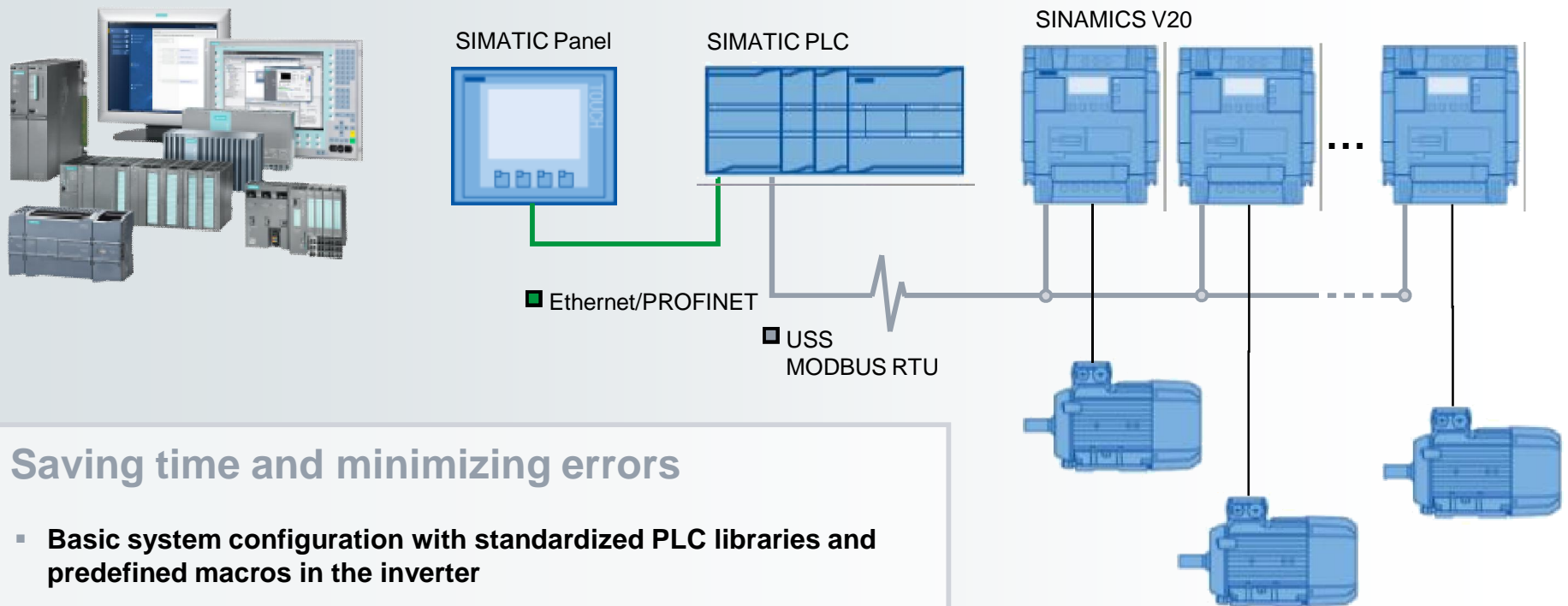


### Hibernation Mode

**Integrated** energy saving functions for **standby mode**.

**Integrated energy saving functions for reduction of the energy consumption.**

## Very simple connection to an automation system



### Saving time and minimizing errors

- Basic system configuration with standardized PLC libraries and predefined macros in the inverter
- One cable to connect SINAMICS V20 with USS or MODBUS RTU
- Integrated communication interface

## SINAMICS V20

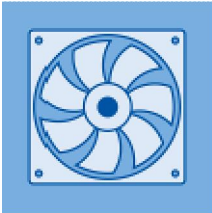


- Introduction
- Product
- Functions
- Communication
- Commissioning
- Tools
- Customer benefits
- **Applications Support**
- Summary



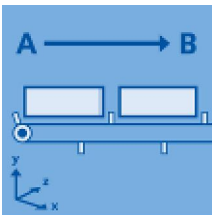
## Target applications

### Pumping, ventilating and compressing



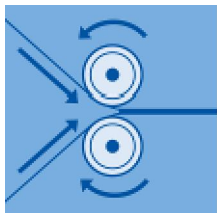
- Centrifugal pumps
- Radial/axial fans
- Compressors

### Moving



- Belt conveyors
- Roller conveyors
- Chain conveyors

### Processing



- **Single drives in the process industry**  
such as mills, mixers, kneaders, crushers, agitators, centrifuges
- **Main drives in machines with mechanically coupled axes**  
such as ring spinning machines, braiding machines for textile, ropes and wire



# Target applications

		Additional advantages
Pumping, ventilating and compressing	<ul style="list-style-type: none"> <li>▪ Centrifugal pumps</li> <li>▪ Radial/axial fans</li> <li>▪ Compressors</li> </ul>	<ul style="list-style-type: none"> <li>▪ High availability through automatic restart and flying restart after power failures</li> <li>▪ Broken belt detection by monitoring the load torque</li> <li>▪ Pump protection against cavitation</li> <li>▪ Hammer start and blockage clearing modes for clogged pumps</li> <li>▪ PID controller for process values (e.g. temperature, pressure, level, flow)</li> <li>▪ PID auto tuning to optimize controller parameters</li> <li>▪ Hibernation mode stops the motor when demand is small</li> <li>▪ Motor staging extends the flow range by adding two more fixed-speed drives (cascade)</li> <li>▪ Frost and condensation protection prevent moisture in motors under extreme environmental conditions</li> </ul>
Moving	<ul style="list-style-type: none"> <li>▪ Belt conveyors</li> <li>▪ Roller conveyors</li> <li>▪ Chain conveyors</li> </ul>	<ul style="list-style-type: none"> <li>▪ Soft, jerk-free acceleration reduces the stress on the gear units, bearings, drums and rollers</li> <li>▪ Super torque start for conveyor belts with high breakaway torque</li> <li>▪ Dynamic behavior by using braking resistor or DC braking</li> <li>▪ Direct control of mechanical holding brake</li> </ul>
Processing	<ul style="list-style-type: none"> <li>▪ <b>Single drives in the process industry</b> such as mills, mixers, kneaders, crushers, agitators, centrifuges</li> <li>▪ <b>Main drives in machines with mechanically coupled axes</b> such as ring spinning machines, braiding machines for textile, ropes and wire</li> </ul>	<ul style="list-style-type: none"> <li>▪ Frost and condensation protection prevent moisture in motors under extreme environmental conditions</li> <li>▪ Higher productivity with uninterrupted production due to “don’t tell me” mode</li> <li>▪ Exchange of regenerative energy via the DC link</li> <li>▪ Super torque start for machines with a high breakaway torque</li> </ul>

## Tough environment – Ceramic tile production line

**SIEMENS**



**SINAMICS V20 was successfully tested in tough environment**

- Simple and crude shop floor
- Constantly high temperatures over 40°C
- Ceramic dust all over the shop floor
- 24h / 7days production

## Tough environment – Textile environment

**SIEMENS**



### SINAMICS V20 was successfully tested in tough environment

- Oil traces on machines and in the air
- Cotton fiber all over the shop floor
- Unstable power supply
- High humidity level (over 75%) and temperatures over 25°C

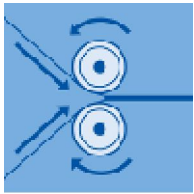
## Long term outdoor running test



SINAMICS V20 resisted long term climate changes.  
And the outdoor running test will go on ...

# First customer successes

## Easy to install & easy to use



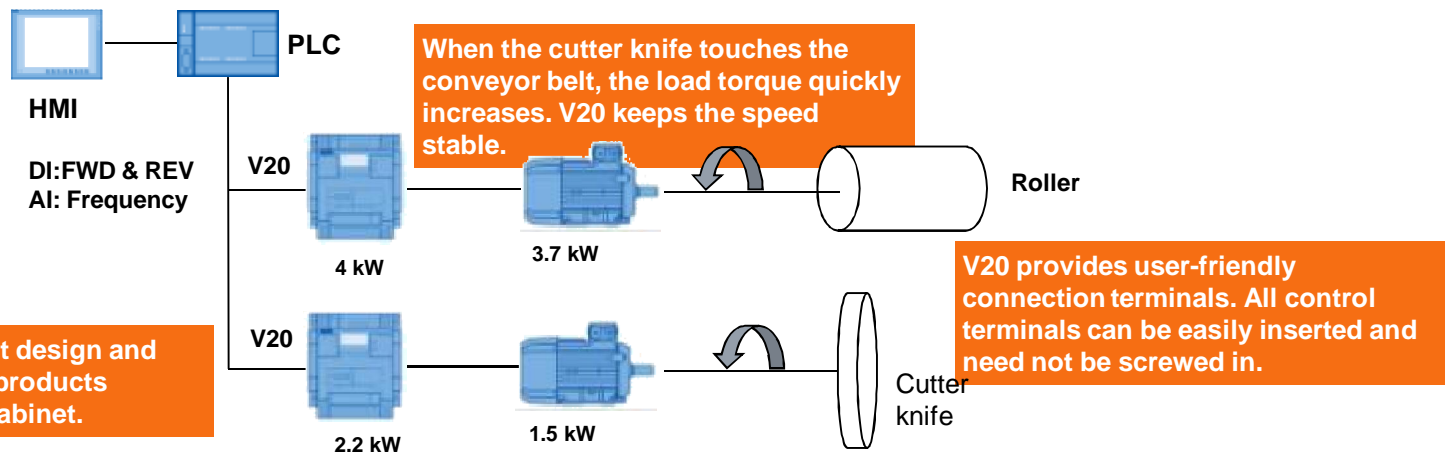
### Machining

## Automatic cutting machine

The machine cuts one or two long adhesive tape rolls into rolls of the preset width.

One motor drives one or two rotating shafts on which the adhesive tape rolls are located. The other one rotates the cutter knife to increase the cutting force.

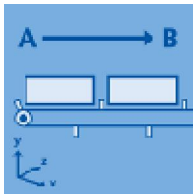
A PLC controls the movement and speed of the two drive motors.



V20 has a more compact design and allows the use of other products without modifying the cabinet.

# First customer successes

## Easy to use

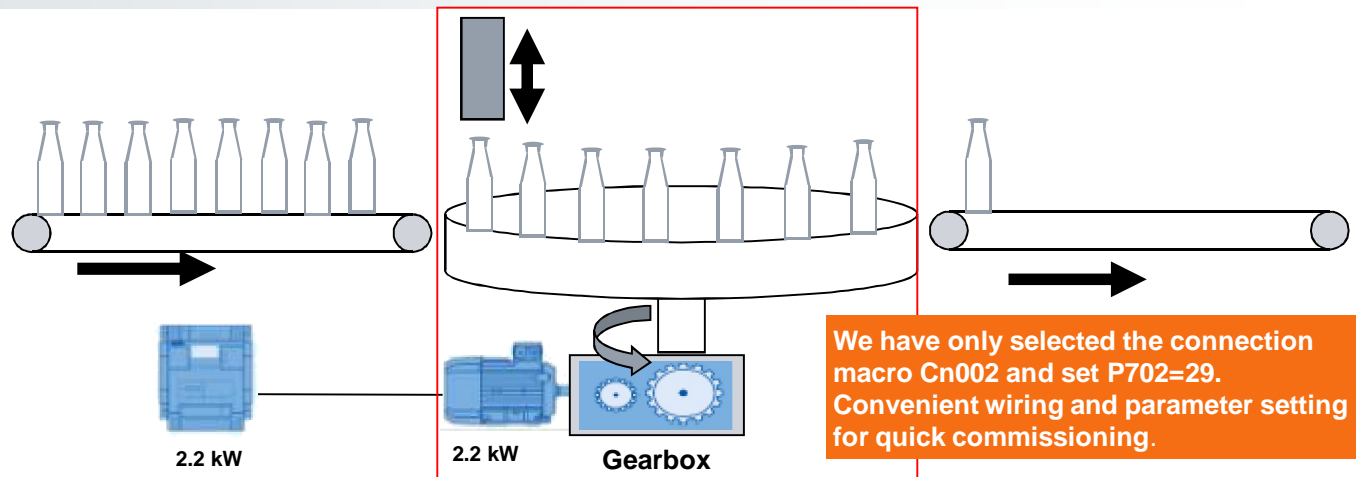
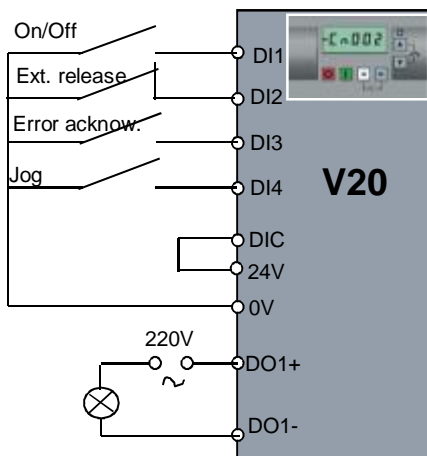


### Transport

## Sealing system / Food and Beverage sector

The sealing system fixes caps on bottles. The machine is an integral part of the production line.

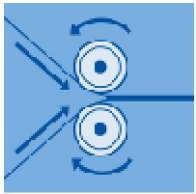
The cycle sequence is set at the BOP. All commands are issued by the data input terminal. The user requires an external emergency stop.



We have only selected the connection macro Cn002 and set P702=29. Convenient wiring and parameter setting for quick commissioning.

# First customer successes

## Easy to use



### Machining

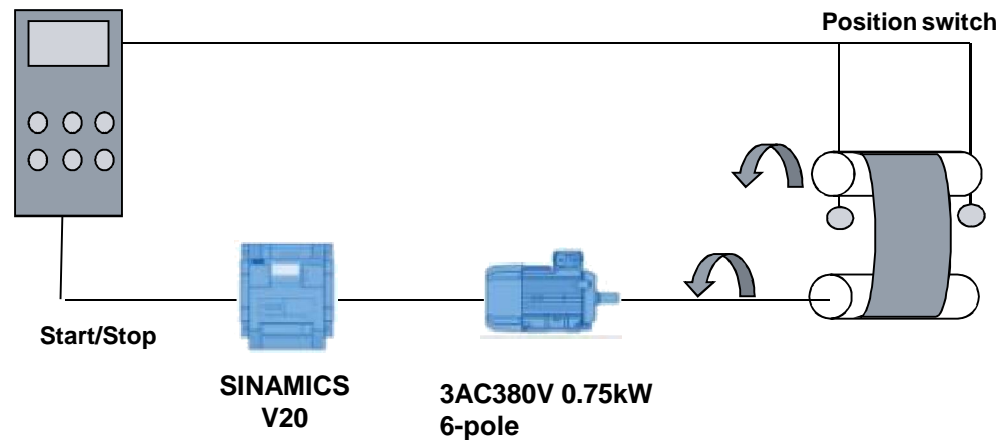
### Grinding machine

The machine performs surface grinding on lacquered wooden flooring.

One motor drives the grinder rollers, which rotates the abrasive belt in one direction. The other motor drives the conveyor belt which controls the feedrate via a stepless gearbox.

All position switches are connected to a special controller which controls the movements of the abrasive and conveyor belts.

Competitor: Delta-B



The terminals of the V20 for connection to the controller are easy to handle.



## SINAMICS V20



- Introduction
- Product
- Functions
- Communication
- Commissioning
- Tools
- Customer benefits
- Service and Logistics Support
- Applications Support
- **Summary**

# SINAMICS V20

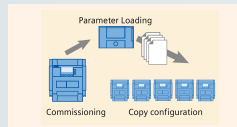
## The new compact drive is ...



... perfectly tailored to meet your requirements ....

### Productivity

Easy to use



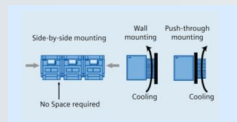
### Energy efficiency

Easy to save money



### Compact

Easy to install



... well thought-out & provides all the *Basics* you need!

- The perfect drive for basic requirements ✓
- Top price level ✓
- 1 MLFB, complete functionality ✓
- Perfect for large quantities ✓
- Short delivery time ✓
- Service: 24-month warranty period ✓

The cost-efficient, reliable and easy to use converter for basic applications

**SIEMENS**

**Thank you for your attention!**

