

警告
不遵守安全说明和操作说明可导致生命危险
本简明操作说明只包含操作变频器的重要信息。若不遵守相关文档中的安全说明和操作说明，会导致人员伤亡或死亡等事故。
• 遵守相关文档中的安全说明和安装说明。
• 参阅：<https://support.industry.siemens.com/cs/zh/view/109769782>

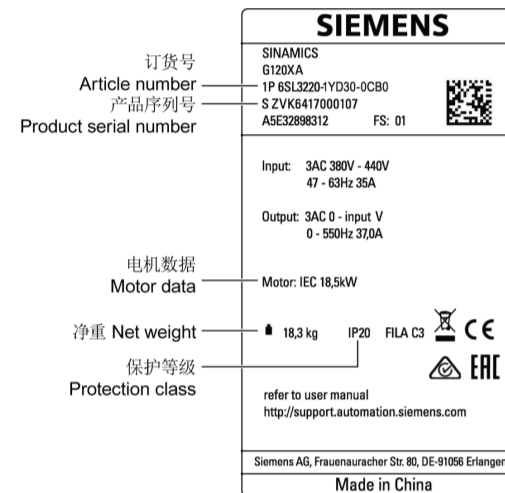
WARNING
Danger to life if the safety instructions and operating instructions are not observed
The compact operating instructions only contain the most important information for operating the converter. If the safety instructions and operating instructions in the associated documentation are not observed, accidents involving severe injuries or death can occur.
• Observe the safety instructions and operating instructions given in the associated documentation.
• See also <https://support.industry.siemens.com/cs/cn/en/view/109769782>

供货范围 Scope of delivery

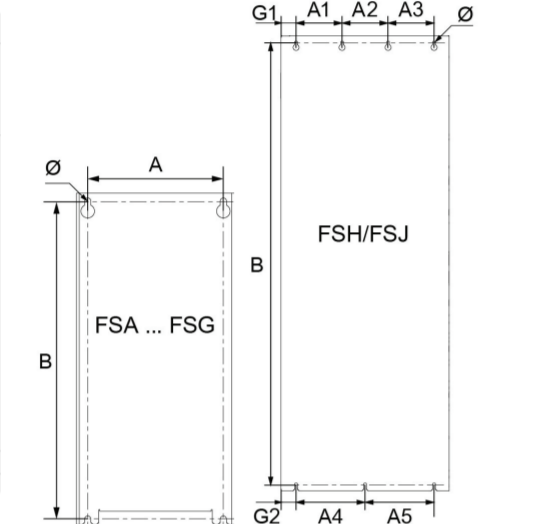
- 供货范围至少包括下列组件：
 - 带可运行固件的即连即用的变频器（变频器由功率模块以及不可拆卸的控制单元组成）。
 - 关于固件升级和降级的方法可访问网址：<https://support.industry.siemens.com/cs/zh/view/109769381>
 - 1个可插拔的、用于连接USS/Modbus RTU的RS485连接器。
 - 1套屏蔽连接件（仅适用于FSA...FSG）。对于FSD...FSG，供货范围内的屏蔽连接件仅适用于控制单元，如需功率单元的屏蔽连接件，可单独订购配件。
 - 简明操作说明（中英对照版）。
 - 一张与相应变频器等尺寸的纸质钻孔尺寸图（仅适用于FSD...FSG），从而便于在安装时进行钻孔操作。
 - 变频器内包含开源软件（OSS）。OSS授权条件保存在变频器中。

- The delivery comprises at least the following components:
 - A ready-to-run converter with loaded firmware. Each converter comprises a Power Module and an undetachable Control Unit. Options for upgrading and downgrading the firmware can be found on the Internet: <https://support.industry.siemens.com/cs/cn/en/view/109769381>
 - One pluggable RS485 connector for USS/Modbus RTU connection.
 - One set of shield connection kit (for FSA ... FSG only). For FSD to FSG, the delivered shield connection kit can only be used with the Control Unit and the shield connection kit for the Power Module can be ordered as an option.
 - Compact Operating Instructions in Chinese and English.
 - A printed full-size drill pattern (for FSD to FSG only), which allows easy drilling of the necessary mounting holes.
 - The converter contains open-source software (OSS). The OSS license terms are saved in the converter.

铭牌示例 Rating plate example



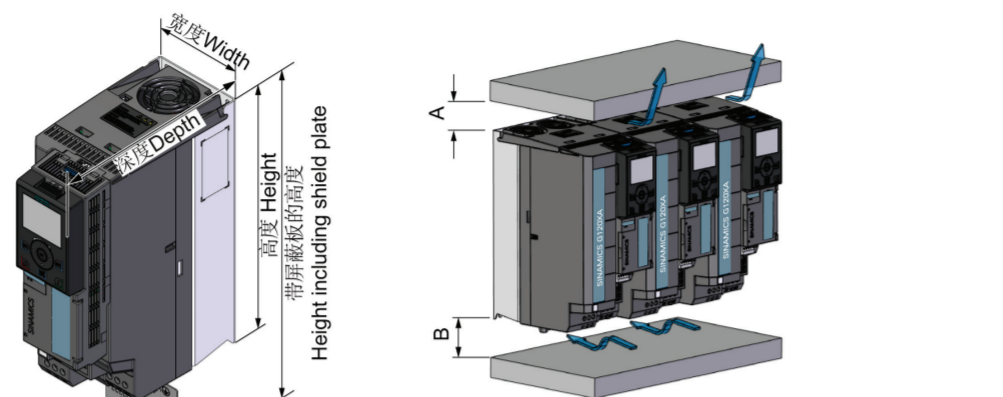
钻孔尺寸 Drill patterns



外形尺寸 Frame size	钻孔尺寸 (mm) Drilling dimensions (mm)			固定方式 Fixings	紧固扭矩 (Nm) Tightening torque (Nm)
	A	B	Ø		
FSA	55	221.5	5	4 x M4	2.5
FSB	80	265	5	4 x M4	2.5
FSC	118	283	5.5	4 x M5	2.5
FSD	170	430	6.0	4 x M5	6
FSE	230	509	6.5	4 x M6	10
FSF	270	680	8.5	4 x M8	25
FSG	265	970.5	12.0	4 x M10	50

外形尺寸 Frame size	钻孔尺寸 (mm) Drilling dimensions (mm)							固定方式 Fixings	紧固扭矩 Tightening torque (Nm)		
	A1	A2	A3	A4	A5	B	G1			G2	Ø
FSH	150	150	150	225	225	1444	49	49	20	7 x M8	25
FSJ	247	200	200	367	315	1399	61	60	20		

尺寸和间距 Dimensions and clearance distance (mm)



FSA ... FSC 并排安装限制条件：
环境温度高于 55 °C，侧间距至少为 50 mm。
Side-by-side mounting restrictions for FSA ... FSC:
A lateral clearance of 50 mm or greater is required for surrounding air temperature higher than 55 °C.

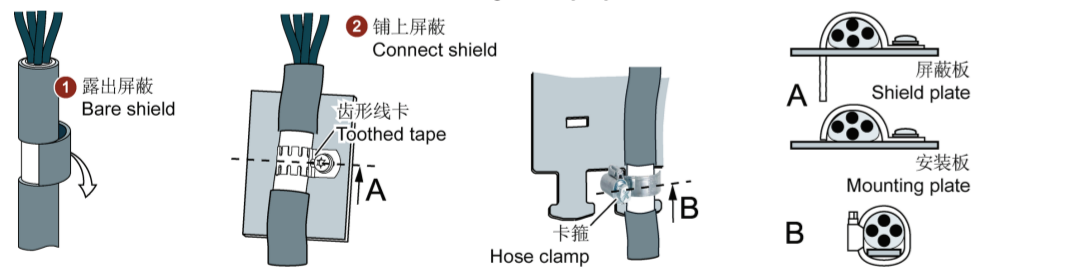
外形尺寸 Frame size	高度 Height	带屏蔽板的高度 Height including shielding plate	宽度 Width	深度 Depth			间距 Clearance	
				不带操作面板或 G120 智能连接模块 Without Operator Panel or G120 Smart Access	带操作面板 With Operator Panel	带 G120 智能连接模块 With G120 Smart Access	A	B
FSA	232	330	73	209	218	216	80	100
FSB	275	383	100	209	218	216	80	100
FSC	295	423	140	209	218	216	80	100
FSD	472	625	200	239	248	246	300	350
FSE	551	729	275	239	248	246	300	350
FSF	709	969	305	360	369	367	300	350
FSG	999	1255	305	360	369	367	300	350
FSH	1487	/	548	410	/	/	200	200
FSJ	1438	/	801	410	/	/	200	200

1) 变频器功率模块 FSD ... FSG 的屏蔽连接件仅作为选件提供。
The shield connection kit for the Power Module FSD to FSG is available as an option only.
2) 对于变频器 FSH/FSJ，变频器之间须保持至少 30 mm 间距，变频器正面须保持至少 100 mm 间距。
FSH and FSJ require 30 mm clearance between individual converters and 100 mm clearance at the front.

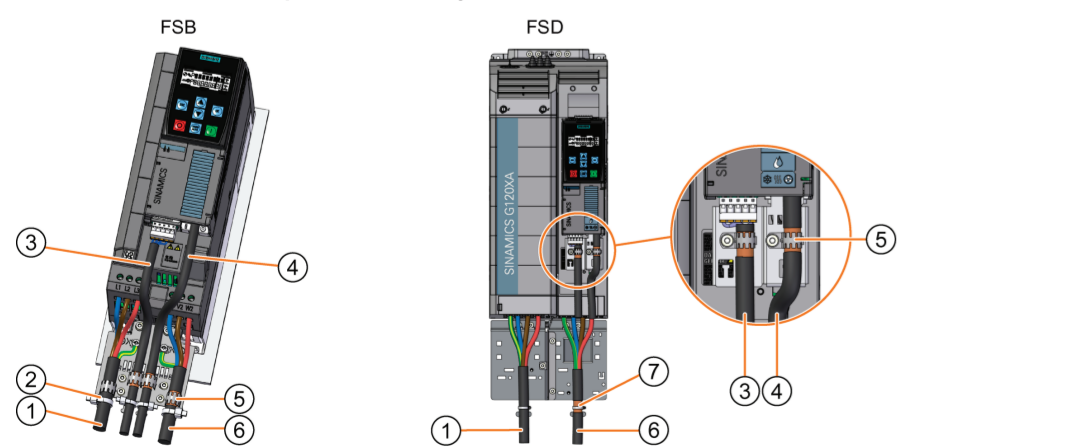
电缆横截面和紧固扭矩 Cable cross-sections and tightening torques

外形尺寸 Frame size	端子 Terminals	端子/连接器类型 Terminal/connector type	电缆横截面(mm²) Cable cross-section (mm²)	紧固扭矩(Nm) Screw tightening torque (Nm)	剥线长度 (mm) Stripped insulation length (mm)
FSA	电源, 电机和 PE	螺钉端子 Screw-type terminals	1.5 ... 2.5	0.5	9 ... 10
FSB	Line, motor and PE		1.5 ... 6	1.3	12 ... 13
FSC	Line, motor and PE		1.5 ... 16	1.3	12 ... 13
FSD			10 ... 35	4.5	18
FSE			25 ... 70	10	25
FSF			35 ... 2 x 120	22 ... 25	/
FSG			35 ... 2 x 185	50	/
FSH	电源, 电机和 PE 和直流端子 Line, motor, PE and DC link	电缆夹 according to SN71322 for M10 screws Cable lug according to DIN46234 for M10 screws	2 x 240	50	/
FSJ		电缆夹 according to DIN46234 for M12 screws	4 x 240	50	/

符合 EMC 规范的屏蔽层敷线示例 EMC shielding cable preparation



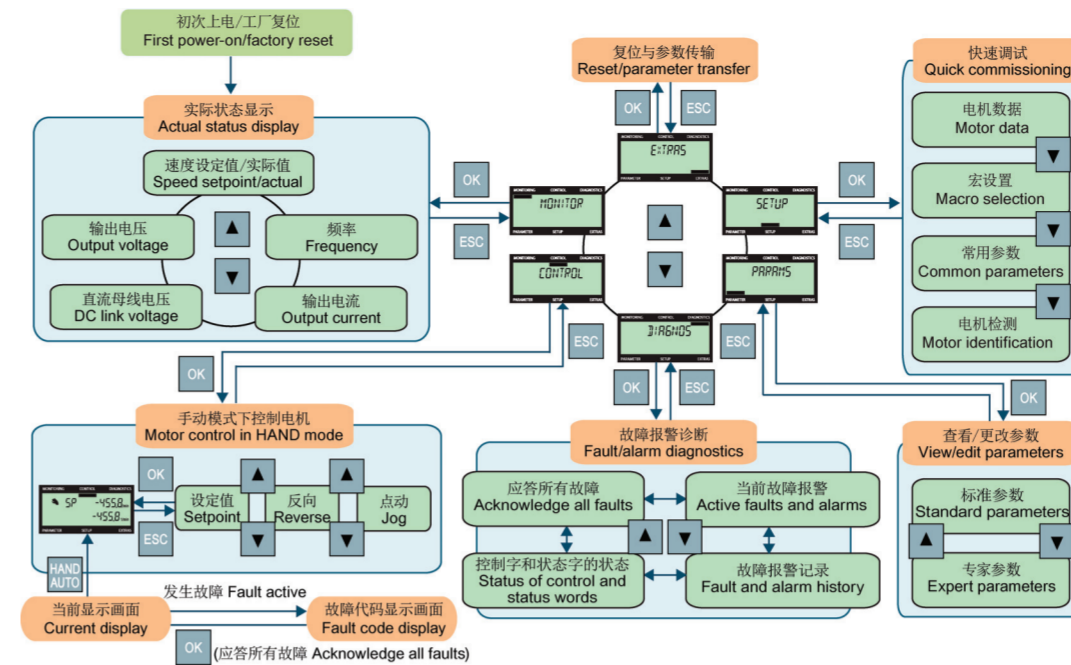
连接电缆屏蔽层示例 Examples of connecting cable shields



① 非屏蔽电源线 Unshielded line cable	⑤ 齿形线卡 Toothed tape
② 束线带 Cable tie	⑥ 屏蔽电机电缆 Shielded motor cable
③ 屏蔽通讯电缆 Shielded communication cable	⑦ 卡箍 Hose clamp
④ 屏蔽控制电缆 Shielded control cable	



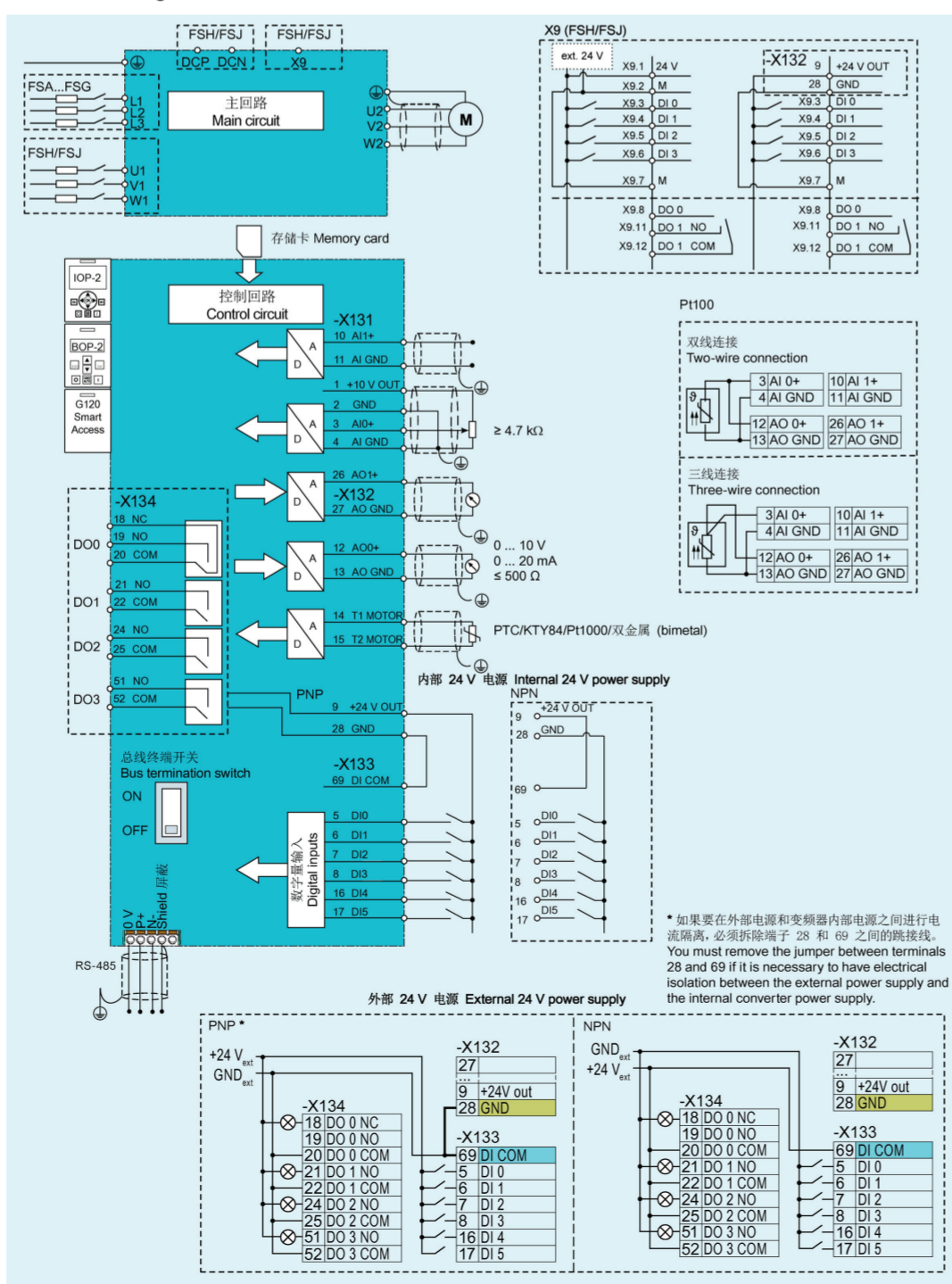
BOP 菜单结构 BOP menu structure



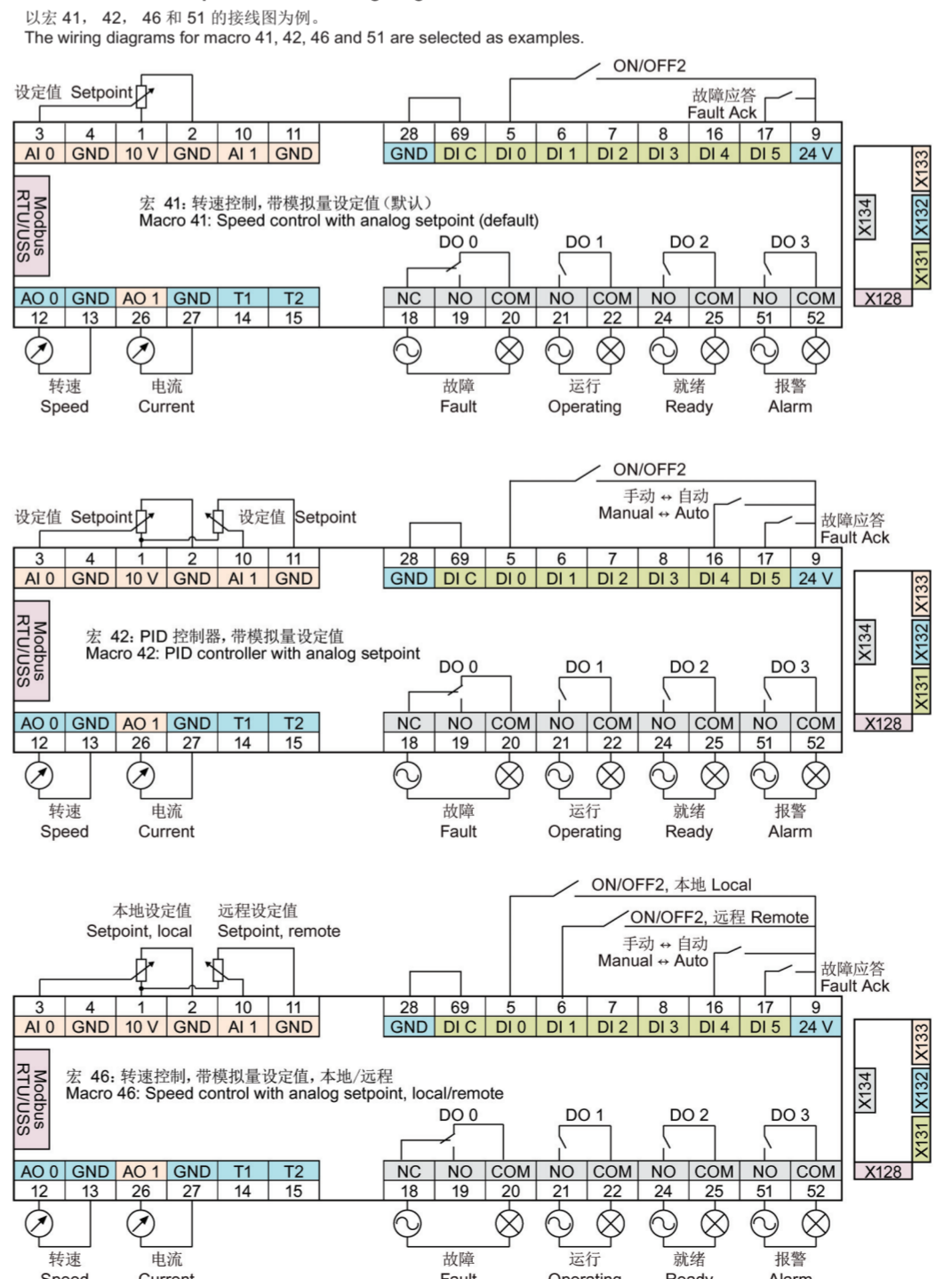
宏概览 Macro overview

宏 Macro	描述 Description
41	转速控制，带模拟量设定值（默认） Speed control with analog setpoint (default)
42	PID 控制器，带模拟量设定值 PID controller with analog setpoint
43	双泵，带模拟量设定值 2 pumps with analog setpoint
44	三泵，带模拟量设定值 3 pumps with analog setpoint
45	转速控制，带固定转速设定值 Speed control with fixed speed setpoint
46	转速控制，带模拟量设定值，本地/远程 Speed control with internal fixed setpoint, local/remote
47	PID 控制器，带内部固定设定值 PID controller with internal fixed setpoint
48	双泵，带内部固定设定值 2 pumps with internal fixed setpoint
49	三泵，带内部固定设定值 3 pumps with internal fixed setpoint
51	Modbus RTU 控制 Modbus RTU control
52	Modbus RTU 控制，本地/远程 Modbus RTU control, local/remote
54	USS 控制 USS control
55	USS 控制，本地/远程 USS control, local/remote

电路图 Block diagram

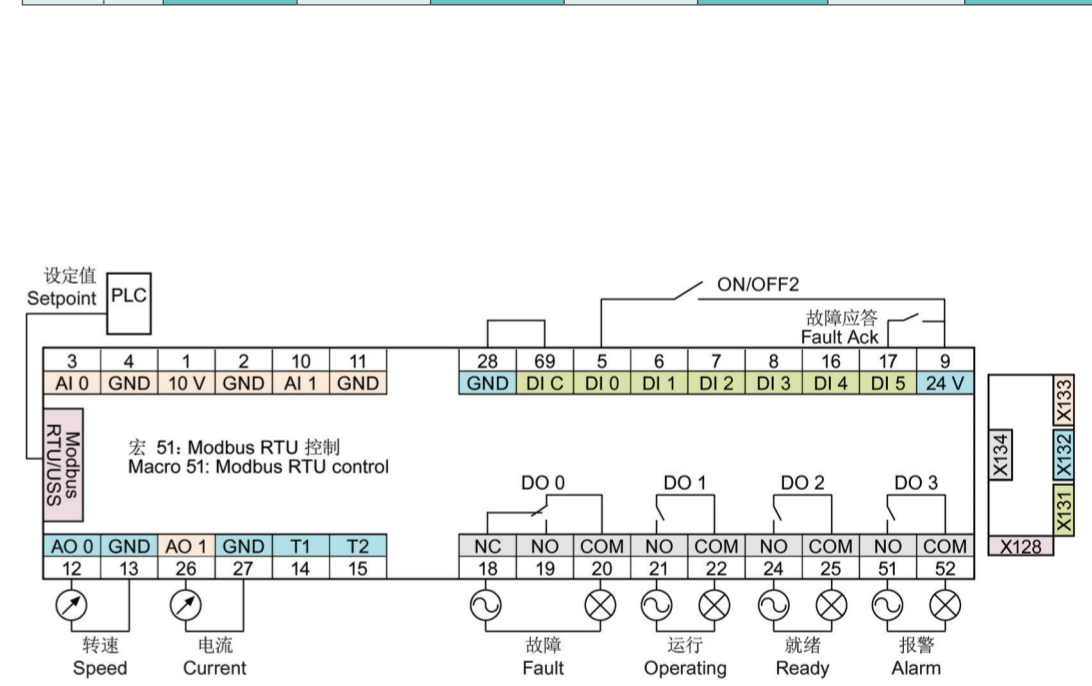


宏接线示意图 Examples of macro wiring diagrams



宏设置 Macro settings (p0015)

端子 Terminal	41	42	43	44	45	46	47
5	DI 0	ON/OFF2	ON/OFF2	ON/OFF2	ON/OFF2	ON/OFF2 本地 ON/OFF2 local	ON/OFF2 远程 ON/OFF2 remote
6	DI 1	-	-	维修泵 1 Service pump 1	维修泵 1 Service pump 1	固定设定值 1 Fixed setpoint 1	-
7	DI 2	-	-	维修泵 2 Service pump 2	维修泵 2 Service pump 2	固定设定值 2 Fixed setpoint 2	-
8	DI 3	-	-	维修泵 3 Service pump 3	维修泵 3 Service pump 3	固定设定值 3 Fixed setpoint 3	-
16	DI 4	-	手动→自动 Manual→Auto	手动→自动 Manual→Auto	手动→自动 Manual→Auto	-	本地→远程 Local→Remote
17	DI 5	应答故障 Acknowledge fault	应答故障 Acknowledge fault	应答故障 Acknowledge fault	应答故障 Acknowledge fault	应答故障 Acknowledge fault	应答故障 Acknowledge fault
18...20	DO 0	故障 Fault	故障 Fault	故障 Fault	故障 Fault	故障 Fault	故障 Fault
21,22	DO 1	运行 Operation	运行 Operation	运行 Operation	泵 1 Pump 1	运行 Operation	运行 Operation
24,25	DO 2	运行就绪 Ready for operation	运行就绪 Ready for operation	运行就绪 Ready for operation	泵 2 Pump 2	运行就绪 Ready for operation	运行就绪 Ready for operation
51,52	DO 3	报警 Alarm	报警 Alarm	报警 Alarm	泵 2 Pump 2	报警 Alarm	报警 Alarm
3	AI 0	设定值 Setpoint	设定值 Setpoint	设定值 Setpoint	设定值 Setpoint	-	设定值, 本地 Setpoint local
10	AI 1	-	PID 实际值 PID actual value	PID 实际值 PID actual value	PID 实际值 PID actual value	-	设定值, 远程 Setpoint remote
12	AO 0	转速实际值 Speed actual value	转速实际值 Speed actual value	转速实际值 Speed actual value	转速实际值 Speed actual value	转速实际值 Speed actual value	转速实际值 Speed actual value
26	AO 1	电流实际值 Current actual value	电流实际值 Current actual value	电流实际值 Current actual value	电流实际值 Current actual value	电流实际值 Current actual value	电流实际值 Current actual value



...或使用链接: ... or follow the link:
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<https://support.industry.siemens.com/cs/cn/en/view/109767180>

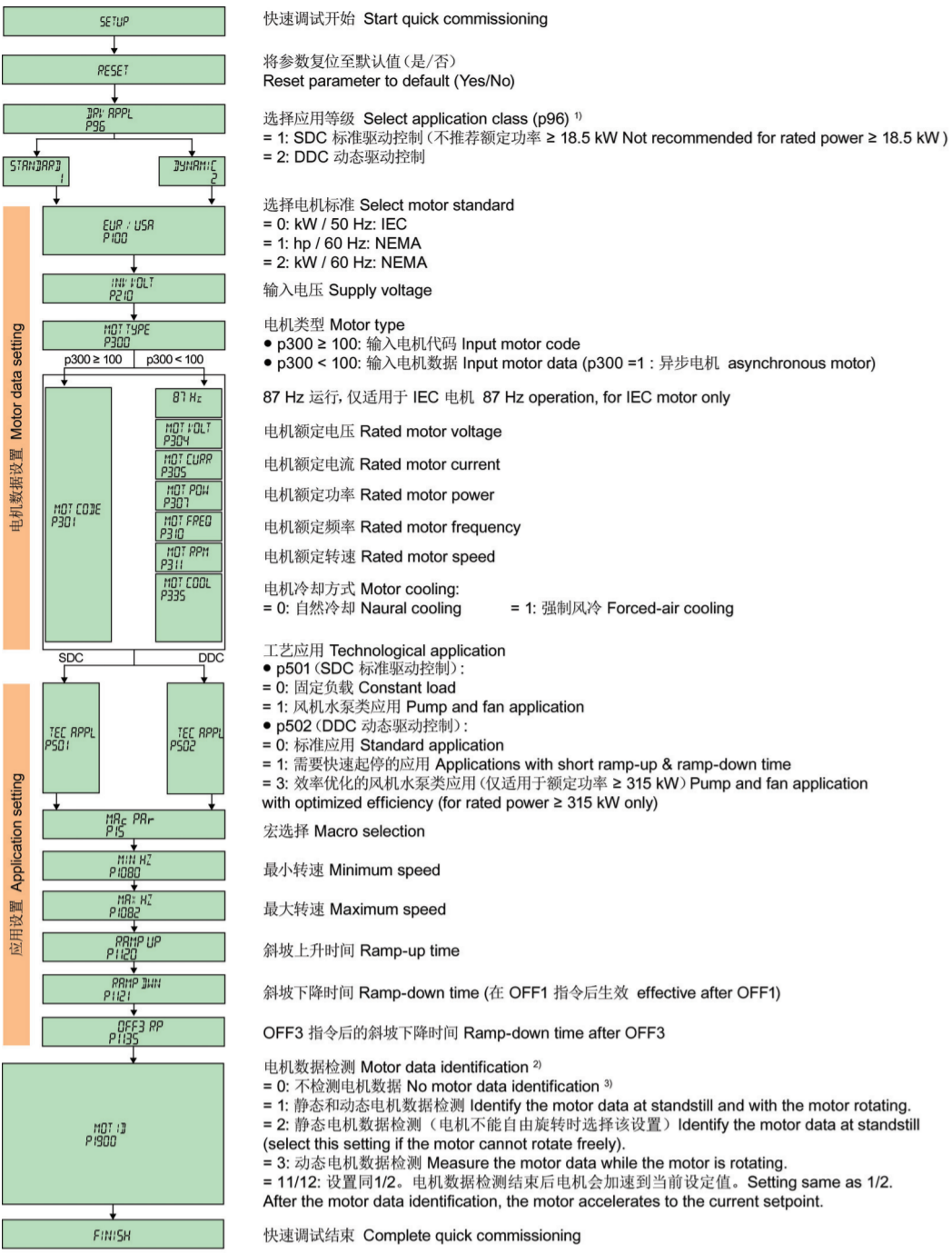


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...或使用链接: ... or follow the link:
<https://support.industry.siemens.com/cs/cn/en/view/109763170>

快速调试 Quick commissioning



1) 有关“专家”应用等级的详细信息，参见操作说明。 For information about application class "expert", see Operating Instructions.
2) 如果选择检测电机数据，电机会在 JOG 时运行。 If motor identification is selected, the motor will rotate when jogging.
3) 如果未连接电机，设 p1900 为 0。 Set p1900 to 0 if no motor is connected.

参数列表 Parameters list

Parameters list table with columns: Parameter, Description, and sub-sections for Converter and motor monitoring, Motor control, Motor control parameters, and CDS and DDS parameters.

变频器及电机监视参数 Converter and motor monitoring parameters

Converter and motor monitoring parameters table listing parameters like r0018, r0021, r0025, etc., with descriptions and units.

故障/报警/监控参数 Faults/warning/monitoring parameters

Faults/warning/monitoring parameters table listing parameters like r0947, r2110, etc., with descriptions.

选项参数 Option parameters

Option parameters table listing parameters like p0230, p0231, etc., with descriptions and options.

固定频率参数 Fixed frequency parameters

Fixed frequency parameters table listing parameters like p1016, p1017, etc., with descriptions and settings.

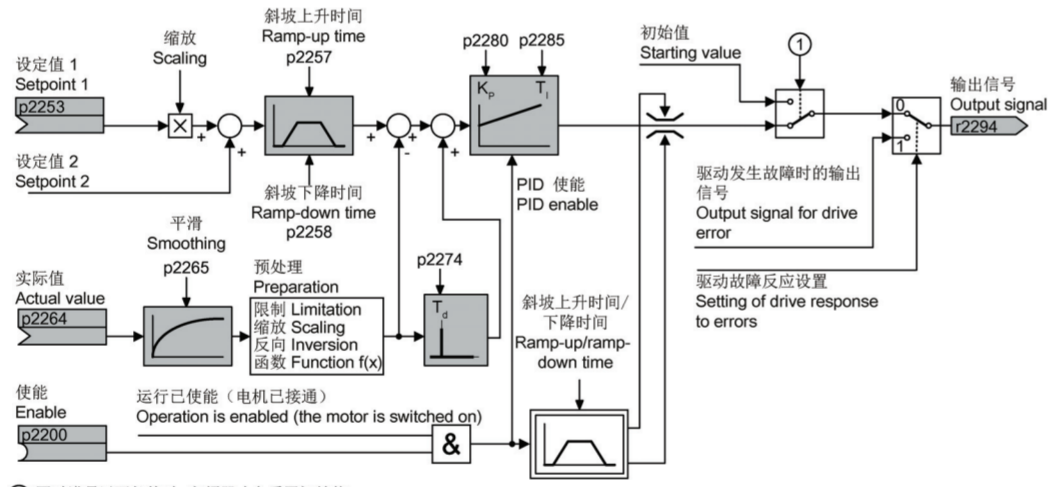
其他变频器及电机特性参数 Other converter and motor feature parameters

Other converter and motor feature parameters table listing parameters like p0003, p0308, etc., with descriptions and access levels.

I/O 命令/二进制 I/O 参数 I/O commands/binary I/O parameters

I/O commands/binary I/O parameters table listing parameters like r0050, r0051, etc., with descriptions and bit settings.

PID 控制参数 PID control parameters



同时满足以下条件时，变频器才会采用初始值：
• PID 提供主设定值 (p2251 = 0)。
• PID 的斜坡函数发生非输出端没有到达初始值。
The converter uses the starting value when all the following conditions are simultaneously satisfied:
• The PID supplies the main setpoint (p2251 = 0).
• The ramp-function generator output of the PID has not yet reached the starting value.

PID control parameters table listing parameters like p2200, p2253, etc., with descriptions and units.

通讯参数 Communication parameters

Communication parameters table listing parameters like p2000, p2002, etc., with descriptions and units.

故障与报警 Faults and alarms

故障列表 Fault list

Fault list table listing fault codes like F01030, F01910, etc., with descriptions and causes.

报警列表 Alarm list

Alarm list table listing alarm codes like A05006, A07321, etc., with descriptions and actions.

备注 Notes

如果需要，可在此空白处记下变频器调试过程中的注意事项。
If desired, use this space to take some notes during the commissioning.