

ABB 标准变频器

快速安装和启动指导
ACS580-01 变频器
外形尺寸 R0 至 R5

R0-
R4

R5



中文 13

English 41

ZH

EN

相关手册列表

变频器手册和指导	Code (English)	代码 (中文)
ACS580 标准控制程序固件手册	3AXD50000016097	3AXD50000016430
ACS580-01 (0.75 至 250 kW) 硬件手册	3AXD50000018826	3AXD50000019738
ACS580-01 快速安装和启动指导 R0 至 R5	3AUA0000076332	3ABD00045450
ACS580-01 快速安装和启动指导 R6 至 R9	3AXD50000009286	3ABD00045451
ACS-AP-x 助手控制盘用户手册	3AUA0000085685	3AXD50000022895
可选件手册和指导		
CDPI-01 通讯适配器模块用户手册	3AXD50000009929	
ACS-AP 控制盘 DPMP-01 安装平台	3AUA0000100140	
ACS-AP 控制盘 DPMP-02/03 安装平台	3AUA0000136205	
FCAN-01 CANopen 适配器模块用户手册	3AFE68615500	
FCNA-01 ControlNet 适配器模块用户手册	3AUA0000141650	
FDNA-01 DeviceNet™ 适配器模块用户手册	3AFE68573360	
FECA-01 EtherCAT 适配器模块用户手册	3AUA0000068940	
FENA-01/-11/-21 Ethernet 适配器模块用户手册	3AUA0000093568	
FEPL-02 Ethernet POWERLINK 适配器模块用户手册	3AUA0000123527	
FPBA-01 PROFIBUS DP 适配器模块用户手册	3AFE68573271	
FSCA-01 RS-485 适配器模块用户手册	3AUA0000109533	
外形尺寸 R6 至 R9 法兰安装快速指导	3AXD50000019099	
法兰安装补充手册	3AXD50000019100	
工具和维护手册和指导		
Drive composer PC 工具用户手册	3AUA0000094606	
变流器模块电容重整说明	3BFE64059629	
NETA-21 远程安装工具用户手册	3AUA00000969391	
NETA-21 远程安装工具安装和启动指导	3AUA0000096881	

您可以在 Internet 上查找 PDF 格式的手册和其它产品文件。请参阅封底内的 [Internet 上的文件库](#) 一节。对于在 “文档” 资料库内没有提供的手册，请联络当地的 ABB 代表。

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额定值和熔断器 R0 - R4

表 1

型号 ACS580 -01-	输入额定值	输出额定值						最大损耗	外形尺寸	
		额定使用				重载使用				
		I_{1N}	I_N	P_N	I_{Ld}	P_{Ld}	I_{Hd}			P_{Hd}
		A	A	kW	A	kW	A			kW
W										
3-phase $U_N = 400\text{ V}$ (380...415 V)										
02A6-4	2.6	2.6	0.75	2.5	0.75	1.8	0.55	45	R0	
03A3-4	3.3	3.3	1.1	3.1	1.1	2.6	0.75	55	R0	
04A0-4	4.0	4.0	1.5	3.8	1.5	3.3	1.1	66	R0	
05A6-4	5.6	5.6	2.2	5.3	2.2	4.0	1.5	84	R0	
07A2-4	7.2	7.2	3.0	6.8	3.0	5.6	2.2	106	R1	
09A4-4	9.4	9.4	4.0	8.9	4.0	7.2	3.0	133	R1	
12A6-4	12.6	12.6	5.5	12.0	5.5	9.4	4.0	174	R1	
017A-4	17	17	7.5	16.2	7.5	12.6	5.5	228	R2	
025A-4	25	25	11.0	23.8	11.0	17.0	7.5	322	R2	
032A-4	32	32	15.0	30.4	15.0	24.6	11	430	R3	
038A-4	38	38	18.5	36.1	18.5	31.6	15	525	R3	
045A-4	45	45	22.0	42.8	22.0	37.7	18.5	619	R3	
062A-4	62	62	30	58	30	45	22	835	R4	
073A-4	73	73	37	68	37	61	30	1024	R4	

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R0-
R4

表 2

型号 ACS580 -01-	输入额定值	输出额定值				最大损耗	外形尺寸	
		额定使用		重载使用				
		I_{1N}	I_{Ld}	P_{Ld}	I_{Hd}			P_{Hd}
		A	A	hp	A			hp
W								
3-phase $U_N = 480\text{ V}$ (440...480 V)								
02A6-4	2.1	2.1	1.0	1.6	0.75	45	R0	
03A3-4	3.0	3.0	1.5	2.1	1.0	55	R0	
04A0-4	3.4	3.4	2.0	3.0	1.5	66	R0	
05A6-4	4.8	4.8	3.0	3.4	2.0	84	R0	
07A2-4	6.0	6.0	3.0	4.0	3.0	106	R1	
09A4-4	7.6	7.6	5.0	4.8	3.0	133	R1	
12A6-4	11.0	11.0	7.5	7.6	5.0	174	R1	
017A-4	14	14.0	10.0	11.0	7.5	228	R2	
025A-4	21	21.0	15.0	14.0	10.0	322	R2	
032A-4	27	27.0	20.0	21.0	15.0	430	R3	
038A-4	34	34.0	25.0	27.0	20.0	525	R3	
045A-4	40	40.0	30.0	34.0	25.0	619	R3	
062A-4	52	52	40	40	30	835	R4	
073A-4	65	65	50	52	40	1024	R4	

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表 3

型号 ACS580 -01-	gG 熔断器				
	I_N	I^2t	电压额定值	ABB 型号	型号 IEC 60269
	A	A ² s	V		
3-phase $U_N = 400/480\text{ V}$ (380...415 V, 440...480 V)					
02A6-4	4	55	500	OFAF000H4	000
03A3-4	6	110	500	OFAF000H6	000
04A0-4	6	110	500	OFAF000H6	000
05A6-4	10	360	500	OFAF000H10	000
07A2-4	10	360	500	OFAF000H10	000
09A4-4	16	740	500	OFAF000H16	000
12A6-4	16	740	500	OFAF000H16	000
017A-4	25	2500	500	OFAF000H25	000
025A-4	32	4000	500	OFAF000H32	000
032A-4	40	7700	500	OFAF000H40	000
038A-4	50	16000	500	OFAF000H50	000
045A-4	63	20100	500	OFAF000H63	000
062A-4	80	37500	500	OFAF000H80	000
073A-4	100	65000	500	OFAF000H100	000

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表 4

型号 ACS580 -01-	uR 或 aR 熔断器				
	I_N	I^2t	电压额定值	Bussmann 型号	型号 IEC 60269
	A	A ² s	V		
3-phase $U_N = 400/480\text{ V}$ (380...415 V, 440...480 V)					
02A6-4	25	130	690	170M1561	000
03A3-4	25	130	690	170M1561	000
04A0-4	25	130	690	170M1561	000
05A6-4	25	130	690	170M1561	000
07A2-4	25	130	690	170M1561	000
09A4-4	25	130	690	170M1561	000
12A6-4	25	130	690	170M1561	000
017A-4	40	460	690	170M1563	000
025A-4	40	460	690	170M1563	000
032A-4	63	1450	690	170M1565	000
038A-4	63	1450	690	170M1565	000
045A-4	80	2550	690	170M1566	000
062A-4	100	4650	690	170M1567	000
073A-4	125	8500	690	170M1568	000

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表 5

型号 ACS580 -01-	UL			
	I_N	电压额定值	Bussmann 型号	UL class
	A	V		
3-phase $U_N = 460\text{ V}$ (440...480 V)				
02A6-4	3	600	JJS-3	T
03A3-4	6	600	JJS-6	T
04A0-4	6	600	JJS-6	T
05A6-4	10	600	JJS-10	T
07A2-4	10	600	JJS-10	T
09A4-4	15	600	JJS-15	T
12A6-4	20	600	JJS-20	T
017A-4	25	600	JJS-25	T
025A-4	35	600	JJS-35	T
032A-4	40	600	JJS-40	T
038A-4	50	600	JJS-50	T
045A-4	60	600	JJS-60	T
062A-4	80	600	JJS-80	T
073A-4	90	600	JJS-90	T

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R0-
R4

R0-
R4

额定值和熔断器 R5

表 1

型号 ACS580 -01-	输入额定值	输出额定值						最大损耗	外形尺寸	
		额定使用				重载使用				
		I_{1N}	I_N	P_N	I_{Ld}	P_{Ld}	I_{Hd}			P_{Hd}
		A	A	kW	A	kW	A			kW
								W		
3-phase $U_N = 400\text{ V}$ (380...415 V)										
088A-4	88	88	45	83	45	72	37	1240	R5	
106A-4	106	106	55	100	55	87	45	1510	R5	

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R5

表 2

型号 ACS580 -01-	输入额定值	输出额定值				最大损耗	外形尺寸
		额定使用		重载使用			
		I_{1N}	I_{Ld}	P_{Ld}	I_{Hd}	P_{Hd}	
		A	A	hp	A	hp	
						W	
3-phase $U_N = 480\text{ V}$ (440...480 V)							
088A-4	77	77	60	65	50	1240	R5
106A-4	96	96	75	77	60	1510	R5

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表 3

型号 ACS580 -01-	gG 熔断器				
	I_N	I^2t	电压额定值	ABB 型号	型号
	A	A ² s	V		IEC 60269
3-phase $U_N = 400/480\text{ V}$ (380...415 V, 440...480 V)					
088A-4	100	65000	500	OFAF000H100	000
106A-4	125	103000	500	OFAF00H125	00

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表 4

Type ACS580 -01-	uR 或 aR 熔断器				
	I_N	I^2t	电压额定值	Bussmann 型号	型号
	A	A ² s	V		IEC 60269
3-phase $U_N = 400/480\text{ V}$ (380...415 V, 440...480 V)					
088A-4	160	16000	690	170M1569	000
106A-4	200	15000	690	170M3815	1

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表 5

型号 ACS580 -01-	UL			
	I_N	电压额定值	Bussmann type	UL 等级
	A	V		
3-phase $U_N = 460\text{ V}$ (440...480 V)				
088A-4	110	600	JJS-110	T
106A-4	150	600	JJS-150	T

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R5

ZH – R0...R4 快速安装指南

本指南简要介绍如何安装和启动变频器。如需了解有关安装的完整信息，请参阅 ACS580-01 (0.75 至 250 kW) 硬件手册 (3AXD50000019738 [中文])。

有关启动说明，请参阅第 33 页的 [ZH – 快速启动指南](#) 一章。

如需阅读手册，请访问 www.abb.com/drives/documents，搜索文件编号。

R0-
R4

遵循安全指导



警告！ 请遵循这些指导。如果您忽略指导，可能会导致受伤、死亡或设备损坏：

- 如果您不是具有资格的电工，请勿进行电气安装工作。
- 当接上主电源时，切勿在变频器、电机电缆或电机上操作。如果变频器已经连接到了输入电源，请在断开输入电源后等待 5 分钟。
- 当变频器或外部控制电路连接了电源时，切勿操作控制电缆。
- 在安装时，确保不让钻孔和研磨出的碎屑进入变频器。
- 确保变频器下方的地面和安装变频器的墙面是阻燃的。

检查电容是否需要重整

如果变频器已经有一年或更长时间未通电（存放或未用），则必须重整电容。

您可以从序列号来判断生产时间。序列号可以在变频器所贴的型号标签上找到。序列号的格式是 MYWWRRXXXX。YY 和 WW 以如下方式说明生产年份和周次：

YY: 13, 14, 15,... 分别代表 2013, 2014, 2015,...

WW: 01, 02, 03,... 分别代表第 1 周、第 2 周、第 3 周、...

有关电容重整的信息，请参阅互联网上的 *Converter module capacitor reforming instructions*（变频器模块电容重整说明）(3BFE64059629 [英语])，网址：
www.abb.com/drives/documents。

ZH

选择电缆

应根据当地规范选择能承载变频器型号标签上标称电流的电缆规格。

确保冷却

R0-
R4

请参阅第 425 页上的表 I (UL : 第 425 页上的表 II) 了解损耗情况。变频器的允许工作温度范围为 -15 到 +50 °C (+5 到 +122 °F)。不允许凝露或结霜。如需了解环境温度和降低额定值的更多信息，请参阅 ACS580-01 (0.75 至 250 kW) 硬件手册 (3AXD50000019738 [中文]) 中的 *Technical data* (技术数据) 一章。

保护变频器和输入电缆

请参阅表 III (第 426 页) 和 IV (第 426 页) ; (UL : 第 427 页的表 V) 了解熔断器的信息。

如果使用 gG 熔断器，请确保熔断器的熔断时间少于 0.5 秒。请遵循当地法规。

在墙上安装变频器

请参阅第 71 页的图 R0...R4 图 A。

检查供电电缆和电机的绝缘

在将输入电缆连接到变频器前，请按当地法规检查其绝缘。

请参阅第 71 页的图 B1。

1. 电缆从变频器断开后，检查电机电缆和电机的绝缘。使用 1000 V 直流测量电压测量各相导线之间的绝缘电阻，然后测量每相导线与保护性接地导线之间的绝缘电阻。ABB 电机的绝缘电阻必须超过 100 Mohm (参照值为 25°C 或 77°F 时测得)。对于其他电机的绝缘电阻，请参阅其制造商的说明。

注：电机外壳内部的湿气会降低绝缘电阻。如果湿气长期存在，请干燥电机后再次测量。

关闭电源并打开盖板

请参阅第 71 页的图 B1。

2. 关断变频器电源。
3. 卸下前盖：用螺丝刀松开固定螺钉 (3a)，从底部向外 (3b) 再向上 (3c) 将前盖拉出。

R0-
R4

检查与 IT（浮地）和角接地的 TN 系统的兼容性

■ EMC 滤波器

内置 EMC 滤波器不适用于 IT（浮地）系统或角接地的 TN 系统。在将变频器连接到电网前断开 EMC 滤波器的连接。查看第 16 页的表。



警告！ 请勿将连接了内置 EMC 滤波器的变频器安装在 IT 系统（浮地电网系统或高阻抗接地 [超过 30 ohm] 电网系统），否则系统可能会通过变频器的 EMC 滤波器电容连接到地电位。这可能会导致危险或损坏变频器。

请勿将连接了内置 EMC 滤波器的变频器安装在角接地的 TN 系统，否则可能会损坏变频器。

注：不连接内置 EMC 滤波器，变频器的 EMC 兼容性会显著降低。

■ 压敏电阻

压敏电阻不适用于 IT（浮地）系统。在将变频器连接到电网前断开压敏电阻的连接。查看第 16 页的表。



警告！ 安装变频器时请勿将压敏电阻连接到 IT 系统（未接地电网系统或高阻抗接地系统 [超过 30 ohm] 的电网系统），否则会损坏压敏电阻的电路。

如须断开 EMC 滤波器 (EMC) 或压敏电阻 (VAR)，请查看下表。具体操作说明请参阅第 17 页。

外形尺寸	EMC 滤波器 (EMC)	压敏电阻 (VAR)	对称接地 TN 系统 (TN-S 系统) ¹	角接地 TN 系统 ²	IT 系统 (浮地或高阻抗接地系统 [>30 ohms]) ³
R0...R3	EMC (1 个开关)	-	不断开	断开	断开
	-	VAR (1 个开关)	不断开	不断开	断开
R4	EMC (2 个螺钉)	-	不断开	外形尺寸 R4 不能用在角接地 TN 系统中。	断开
	-	VAR (1 个螺钉)	不断开		断开

1

变频器

2

变频器

3

变频器

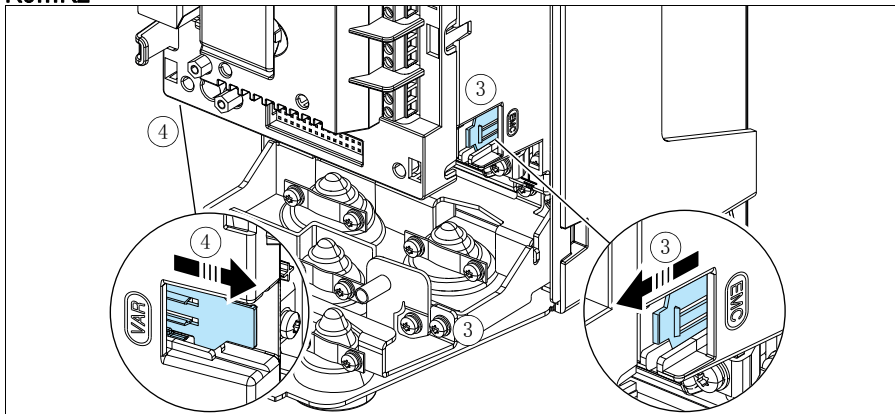
■ 断开 EMC 滤波器或压敏电阻（必要时）

如果必要时要断开内置 EMC 滤波器或压敏电阻，请执行以下操作：

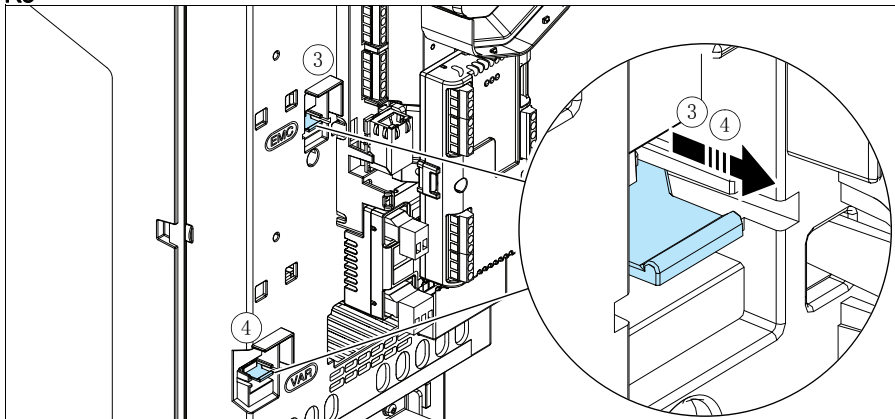
1. 关断变频器电源。
2. 打开前盖（如果尚未打开），请参阅第 71 页的图 B1。
3. R0...R3: 按箭头方向滑动 EMC 开关，断开内置 EMC 滤波器。
R4: 卸下两颗 EMC 螺钉，断开内置 EMC 滤波器。
4. R0...R3: 按箭头方向滑动压敏电阻开关，将压敏电阻断开。
R4: 卸下压敏电阻螺钉，断开压敏电阻。

R0-
R4

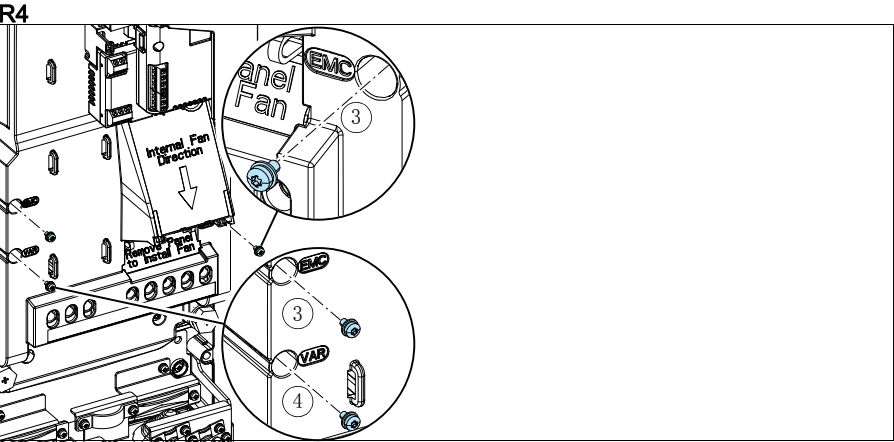
R0...R2



R3



ZH



连接电缆

请参阅图 C1 (第 71 页)、C2, D, E, F1, F2, G1 和 G2。

1. 从引线板卸下橡胶绝缘圈。

电机电缆请使用对称屏蔽线。如果屏蔽电缆为变频器或电机的唯一保护接地线，请确保地线有足够的导电能力。

R0-
R4

2. 在橡胶绝缘圈上切出足够大的孔。将绝缘圈套入电缆。

3. 如图 3a 和 3b 所示准备好电机电缆的两端 (示出了两种不同的电机电缆)。注：将屏蔽线裸线做 360 度接地。将黄绿色双绞屏蔽线标记为保护接地线。

4. 将电缆从底板的孔中穿过并将绝缘圈固定到孔上。

5. 连接电机电缆：

- 将供电电缆夹的接地支架紧固到电缆的剥开部分，将屏蔽线做 360 度接地 (5a)。
- 将电缆的扭绞屏蔽层连接到接地端子 (5b)。
- 将电缆的相线连接到 T1/U, T2/V 和 T3/W 端子 (5c)。按图中给出的力矩拧紧螺钉。

6. 对输入电缆重复步骤 2...4。

7. 连接输入电缆。连接电缆的附加保护接地导线 (7c)。按图中给出的力矩拧紧螺钉。

8. 安装制动电阻电缆的接地架。

9. 对制动电阻电缆重复步骤 2...4 (如有使用)。切除多余的相线 (如有)。

10. 连接电阻电缆 (如有) 按图中给出的力矩拧紧螺钉。

11. 安装控制电缆的接地支架。

12. 将未使用的橡胶绝缘圈装回到穿孔板的孔上。

13. 将导线在变频器单元外机械紧固。

14. 在电机端将电机电缆屏蔽层接地。为将射频干扰降到最小，在电机接线盒的穿孔部分将电机电缆屏蔽层做 360 度接地。

连接控制电缆

请参阅第 73 页图片 *R0...R4 Figures H*。图中所示为一根模拟信号电缆和一根数字信号电缆的示例。请按所使用的宏进行连接。ABB 标准宏的默认连接见第 21 页的 [默认 I/O 连接](#) 一节。

R0-
R4

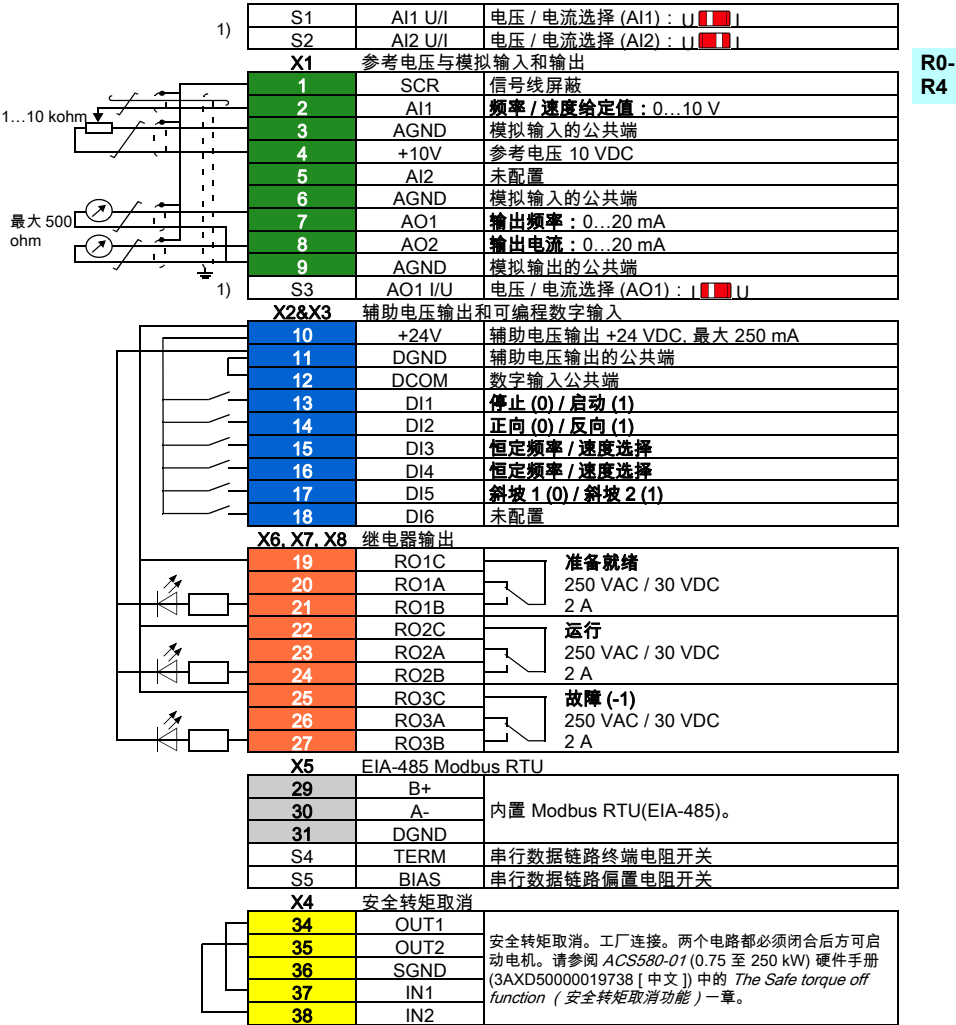
1. 卸下前盖（如果尚未卸下）。请参阅第 15 页的 [关闭电源并打开盖板](#) 一节。

模拟信号电缆连接示例：

2. 在橡胶绝缘圈上切一个足够大的孔，然后将绝缘圈套入电缆。将电缆从底板的孔中穿过并将绝缘圈固定到孔上。
1. 将电缆的外屏蔽层在接地夹下做 360 度接地。靠近控制电路板端子的电缆的剥开部分要尽可能少。在 SCR1 端子处将成对电缆屏蔽和接地线也做接地。
2. 如图所示进行布线。
3. 将导线连接到控制板的对应端子上，并紧固到 0.5...0.6 N·m(0.4 lbf·ft)。
4. 将全部控制电缆都绑到提供的电缆捆绑架上。

默认 I/O 连接

ABB 标准宏的默认 I/O 连接如下所示。



安装可选模块

请参阅 *ACS580-01* (0.75 至 250 kW) 硬件手册 (3AXD50000019738 [中文]) 中的 *电气安装*一章。

R0-
R4

装回盖板

请参阅第 74 页的图 1。

1. 将盖板顶部内侧的搭扣放进外壳上的扣眼 (1a)，然后在底部按下盖板 (1b)。
2. 用螺丝刀将紧固螺钉拧紧。

有关启动说明，请参阅第 33 页的 *ZH – 快速启动指南*一章。

ZH – R5 快速安装指南

本指南简要介绍如何安装和启动变频器。如需了解有关安装的完整信息，请参阅 *ACS580-01* (0.75 至 250 kW) 硬件手册 (3AXD50000019738 [中文])。有关启动说明，请参阅第 33 页的 *ZH – 快速启动指南* 一章。

如需阅读手册，请访问 www.abb.com/drives/documents，搜索文件编号。

R5

遵循安全指导



警告！ 请遵循这些指导。如果您忽略指导，可能会导致受伤、死亡或设备损坏：

- 如果您不是具有资格的电工，请勿进行电气安装工作。
- 当接上主电源时，切勿在变频器、电机电缆或电机上操作。如果变频器已经连接到了输入电源，请在断开输入电源后等待 5 分钟。
- 当变频器或外部控制电路连接了电源时，切勿操作控制电缆。
- 在安装时，确保不让钻孔和研磨出的碎屑进入变频器。
- 确保变频器下方的地面和安装变频器的墙面是阻燃的。

检查电容是否需要重整

如果变频器已经有一年或更长时间未通电（存放或未用），则必须重整电容。

您可以从序列号来判断生产时间。序列号可以在变频器所贴的型号标签上找到。序列号的格式是 MYWWXXXX。YY 和 WW 以如下方式说明生产年份和周次：

YY: 13, 14, 15, ... 分别代表 2013, 2014, 2015, ...

WW: 01, 02, 03, ... 分别代表第 1 周、第 2 周、第 3 周、...

有关电容重整的信息，请参阅互联网上的 *Converter module capacitor reforming instructions*（变频器模块电容重整说明）(3BFE64059629 [英语])，网址：
www.abb.com/drives/documents。

ZH

选择电缆

应根据当地规范选择能承载变频器型号标签上标称电流的电缆规格。

确保冷却

R5

请参阅第 429 页上的表 I (UL : 第 429 页的表 II) 了解损耗情况。变频器的允许操作温度范围是 -15 到 +50°C (+5 到 +122°F)。不允许凝露或结霜。如需了解环境温度和降低额定值的更多信息，请参阅 ACS580-01 (0.75 至 250 kW) 硬件手册 (3AXD50000019738 [中文]) 中的 *Technical data* (技术数据) 一章。

保护变频器和输入电缆

请参阅表 III (第 429 页) 和 IV (第 429 页) ; (UL : 第 430 页的表 V) 了解熔断器的信息。

如果使用 gG 熔断器，请确保熔断器的工作时间少于 0.5 秒。遵循当地法规。

在墙上安装变频器

请参阅第 75 页的图 R5 图 A。

检查供电电缆和电机的绝缘

在将输入电缆连接到变频器前，请按当地法规检查其绝缘。

请参阅第 75 页的图 B。

1. 电缆从变频器断开后，检查电机电缆和电机的绝缘。使用 1000 V 直流测量电压测量各相导线之间的绝缘电阻，然后测量每相导线与保护性接地导线之间的绝缘电阻。ABB 电机的绝缘电阻必须超过 100 Mohm (参照值为 25°C 或 77°F 时测得)。对于其他电机的绝缘电阻，请参阅其制造商的说明。

注：电机外壳内部的湿气会降低绝缘电阻。如果湿气长期存在，请干燥电机后再次测量。

关闭电源并打开盖板

请参阅第 75 页的图 B。

2. 关断变频器电源。
3. IP21, 拆卸模块盖：用螺丝刀松开固定螺钉 (3a)，从底部向外 (3b) 再向上 (3c) 将前盖拉出。
4. IP21, 拆卸箱盖：用螺丝刀松开固定螺钉 (4a)，向下滑出盖子 (4b)。
5. IP55, 拆卸前盖：用螺丝刀松开固定螺钉 (4a)，从底部向外 (4b) 再向上 (4c) 将前盖拉出。

R5

检查与 IT（未接地）与角接地的 TN 系统的兼容性

■ EMC 滤波器

内置 EMC 滤波器不适用于 IT（浮地）系统或角接地的 TN 系统。在将变频器连接到电网前断开 EMC 滤波器的连接。查看第 26 页的表。



警告！ 请勿将连接了内置 EMC 滤波器的变频器安装在 IT 系统（浮地电网系统或高阻抗接地系统 [超过 30 ohm] 的电网系统），否则系统将可能会通过变频器的 EMC 滤波器电容连接到接地线。这可能会导致危险或损坏变频器。

请勿将连接了内置 EMC 滤波器的变频器安装在角接地的 TN 系统，否则可能会损坏变频器。

注：不连接内置 EMC 滤波器，变频器的 EMC 兼容性会显著降低。

■ 压敏电阻

压敏电阻不适合在 IT（浮地）系统上使用。在将变频器连接到电网前断开压敏电阻的连接。查看第 26 页的表。

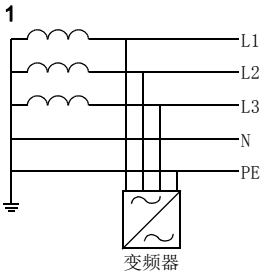


警告！ 安装变频器时请勿将压敏电阻连接到 IT 系统（未接地电网系统或高阻抗接地系统 [超过 30 ohm] 的电网系统），否则会损坏压敏电阻的电路。

如须断开 EMC 滤波器 (EMC) 或压敏电阻 (VAR)，请查看下表。具体操作说明请参阅第 27 页。

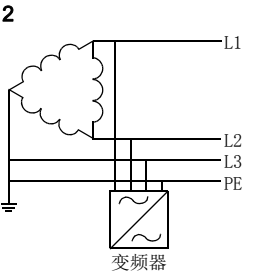
外形尺寸	EMC 滤波器 (EMC)	压敏电阻 (VAR)	对称接地 TN 系统 (TN-S 系统) ¹	角接地 TN 系统 ²	IT 系统 (浮地或高阻抗接地系统 [$>30\text{ ohms}$]) ³
R5	EMC (2 个螺钉)	-	不断开	外形尺寸 R5 不能用在角接地 TN 系统中。	断开
	-	VAR (1 个螺钉)	不断开		断开

1



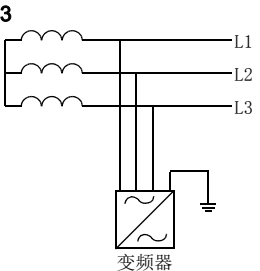
变频器

2



变频器

3



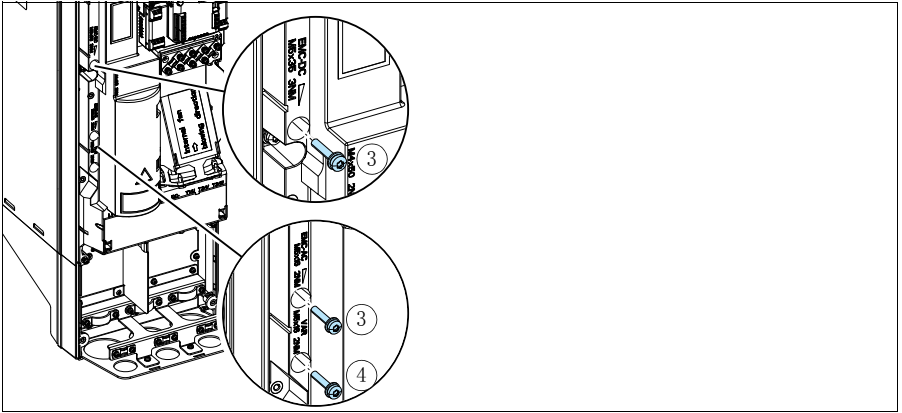
变频器

■ 必要时断开 EMC 滤波器或压敏电阻

如果必要时要断开内置 EMC 滤波器或压敏电阻，请执行以下操作：

1. 关断变频器电源。
2. 打开前盖（如果尚未打开），请参阅第 75 页的图 B。
3. 卸下两颗 EMC 螺钉，断开内置 EMC 滤波器。
4. 卸下压敏电阻螺钉，断开压敏电阻。

R5



ZH

连接电缆

请参阅图 C (第 76 页)、D 和 E。

1. 将本地语言的剩余电压警告贴纸贴在控制电路板旁。
2. 用螺丝刀松开搭扣，并将护罩拉出，卸下供电电缆端子上的护罩。

R5

电机电缆请使用对称屏蔽线。如果屏蔽电缆为变频器或电机的唯一保护接地线，请确保地线有足够的导电能力。

3. 在橡胶绝缘圈上切出足够大的孔。将绝缘圈套入电缆。
4. 如图 4a 和 4b 所示准备好电机电缆的两端 (示出了两种不同的电机电缆)。注：将屏蔽线裸线做 360 度接地。将黄绿色双绞屏蔽线标记为保护接地线。
5. 将电缆从底板的孔中穿过并将绝缘圈固定到孔上。
6. 连接电机电缆：
 - 将供电电缆夹的接地支架紧固到电缆的剥开部分，将屏蔽线做 360 度接地 (6a)。
 - 将电缆的双绞线屏蔽层连接到接地端子 (6b)。
 - 将电缆的相线连接到 T1/U, T2/V 和 T3/W 端子 (6c)。按图中给出的力矩拧紧螺钉。
7. 对输入电缆重复步骤 3...5。
8. 连接输入电缆。按图中给出的力矩拧紧螺钉。
9. 安装电缆盒板。放好板并拧紧螺钉。
10. 将护罩顶部的搭扣放进变频器机架上的扣眼中，然后将护罩按到位，将护罩重新装到电源端子上。
11. 将导线在变频器单元外机械紧固。
12. 请参阅图 R5 Figures F (第 77 页)。在电机端将电机电缆屏蔽层接地。为实现最小的射频干扰，在电机接线盒的穿孔部分将电机电缆屏蔽层做 360 度接地。

连接控制电缆

请参阅第 78 页图 H。图中所示为一根模拟信号电缆和一根数字信号电缆的示例。请按所使用的宏进行连接。ABB 标准宏的默认连接见第 30 页的默认 I/O 连接。

1. 卸下前盖 (如果尚未卸下)。请参阅第 25 页的 [关闭电源并打开盖板](#)一节。

模拟信号电缆连接示例：

2. 在橡胶绝缘圈上切一个足够大的孔，然后将绝缘圈套入电缆。将电缆从底板的孔中穿过并将绝缘圈固定到孔上。
3. 将电缆的外屏蔽层在接地夹下做 360 度接地。靠近控制电路板端子的电缆的剥开部分要尽可能少。在 SCR1 端子处将成对电缆屏蔽和接地线也做接地。
4. 如图所示进行布线。
5. 将导线连接到控制板的对应端子上，并紧固到 0.5...0.6 N·m(0.4 lbf·ft)。
6. 将全部控制电缆都绑到提供的电缆捆绑架上。

R5

ZH

默认 I/O 连接

ABB 标准宏的默认 I/O 连接如下所示。

R5

1...10 kohm

最大 500 ohm

1)

1)

S1	AI1 U/I	电压 / 电流选择 (AI1):
S2	AI2 U/I	电压 / 电流选择 (AI2):
X1 参考电压与模拟输入和输出		
1	SCR	信号线屏蔽
2	AI1	频率 / 速度给定值: 0...10 V
3	AGND	模拟输入的公共端
4	+10V	参考电压 10 VDC
5	AI2	未配置
6	AGND	模拟输入的公共端
7	AO1	输出频率: 0...20 mA
8	AO2	输出电流: 0...20 mA
9	AGND	模拟输出的公共端
S3	AO1 I/U	电压 / 电流选择 (AO1):
X2 & X3 辅助电压输出和可编程数字输入		
10	+24V	辅助电压输出 +24 V DC, 最大 250 mA
11	DGND	辅助电压输出的公共端
12	DCOM	数字输入公共端
13	DI1	停止 (0) / 启动 (1)
14	DI2	正向 (0) / 反向 (1)
15	DI3	恒定频率 / 速度选择
16	DI4	恒定频率 / 速度选择
17	DI5	斜坡 1 (0) / 斜坡 2 (1)
18	DI6	未配置
X6, X7, X8 继电器输出		
19	RO1C	 准备就绪 250 V AC / 30 V DC 2 A
20	RO1A	
21	RO1B	
22	RO2C	 运行 250 V AC / 30 V DC 2 A
23	RO2A	
24	RO2B	
25	RO3C	 故障 (-1) 250 V AC / 30 V DC 2 A
26	RO3A	
27	RO3B	
X5 EIA-485 Modbus RTU		
29	B+	内置 Modbus RTU(EIA-485)。
30	A-	
31	DGND	
S4	TERM	串行数据链路终端电阻开关
S5	BIAS	串行数据链路偏置电阻开关
X4 安全转矩取消		
34	OUT1	安全转矩取消。工厂连接。两个电路都必须闭合后方可启动电机。请参阅 ACS580-01 (0.75 至 250 kW) 硬件手册 (3AXD500000019738 [中文]) 中的 (安全转矩取消功能) 一章。
35	OUT2	
36	SGND	
37	IN1	
38	IN2	

1) 所有控制板都没有开关 S1, S2 和 S3。在此情况下，用参数为输入 AI1 和 AI2 选择电压或电流。请参阅固件手册。

辅助电压输出 +24V (X2:10) 的总负载能力为 6.0 W (250 mA / 24 V DC)。
电缆规格：
0.2...2.5 mm² (24...14 AWG)：端子 +24V, DGND, DCOM, B+, A-, DGND, 外部 24V
0.14...1.5 mm² (26...16 AWG)：端子 DI, AI/O, AGND, RO, STO
紧固力矩：0.5...0.6 N·m (0.4 lbf·ft)

安装可选模块

请参阅 *ACS580-01* (0.75 至 250 kW) 硬件手册 (3AXD50000019738 [中文]) 中的 *电气安装* 一章。

装回盖板

请参阅第 78 页的图 H。

R5

1. IP21, 装回箱盖：向上滑动盖子 (1a)，然后拧紧固定螺钉 (1b)。
2. IP21, 装回模块盖：将盖板顶部内侧的搭扣放进外壳上的扣眼 (2a)，在底部按下盖板 (2b)，然后拧紧固定螺钉 (2c)。
3. IP55, 装回前盖：将盖板顶部内侧的搭扣放进外壳上的扣眼 (3a)，在底部按下盖板 (3a)，然后拧紧固定螺钉 (3b)。

有关启动说明，请参阅第 33 页的 *ZH – 快速启动指南* 一章。

ZH

R5

ZH

ZH – 快速启动指南

本指南介绍如何在辅助控制面板上使用“首次启动助手”启动传动。

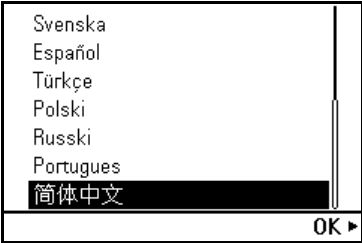
启动之前

确保按照第 13 页的 *ZH13 – R0...R4 快速安装指南* 一章（外形尺寸 R0...R4）或第 23 页的 *ZH – R5 快速安装指南* 一章（外形尺寸 R5）所述安装传动。

R0-
R9

1

在助手型控制面板上用“初次启动助手”启动

安全	
☐	确保安装工作已经完成。确保传动的盖板和电缆盒位置就位。
☐	 检查确保电机的启动不造成任何危险。如果由于不正确的转动方向可能导致损坏， 请将被驱动的机器断开。
使用助手型控制面板的提示	
显示屏底部的两个命令（右图的 Options 和 Menu）显示了屏幕下方的两个软键  和  的功能。分配给软键的命令在不同上下文环境中会有所不同。 用 , ,  和  键移动光标和 / 或根据当前视图修改值。  键会显示一个上下文相关的帮助页面。	
1 – 首次启动助手引导的设置： 语言、日期和时间、电机额定值	
☐	请准备好电机铭牌数据。 给传动上电。
☐	“首次启动助手”会引导您完成首次启动。 助手会自动开始运行。等待控制面板进入如右图所示的画面。 选择您想使用的语言（如果尚未选中），然后按  (OK)。 注：选择了语言后，控制面板需要花费几分钟时间来激活。
	

ZH

R0-
R9



☐	选择开始设置并按 (下一步)。	本地 ACS580 0.0 Hz 设置向导 现在设置传动? 开始设置 退出, 上电时不显示 返回08:27下一个
☐	选择希望使用的单位并按 (下一步)。	本地 ACS580 0.0 Hz 本地化 单位默认值: 国际 (SI) 美国标准 (英制) 返回08:27下一个
☐	如有必要, 修改面板上显示的单位。 • 按 进入所选行的编辑视图。 • 用 和 滚动视图。 按 (下一步) 进入下一个视图。	本地 ACS580 0.0 Hz 单位 如果需要: 改变显示单位。 功率: kW 温度: °C 转矩: Nm 货币: EUR 返回08:28下一个
☐	要在编辑视图上选择一个值: • 用 和 选择值。 按 (保存) 接受新设置, 或按 (取消) 来返回原先视图而不做任何修改。	本地 ACS580 0.0 Hz 功率: kW hp 取消11:55保存
☐	设置日期和时间以及日期时间显示格式。 • 按 进入所选行的编辑视图。 • 用 和 滚动视图。 按 (下一步) 进入下一个视图。	本地 ACS580 0.0 Hz 日期与时间 请输入当前日期和时间。 日期19.09.2014 时间08:28:15 显示日期方式日.月.年 显示时间方式24-小时 返回08:28下一个

ZH

☐	要在编辑视图上更改一个值： - 用 和 左右移动光标。 - 用 和 修改数值。 - 按 (保存) 接受新设置，或按 (取消) 来返回原先视图而不做任何修改。	
☐	要给传动命名 (显示在顶部)，按 。 如果您不想修改默认名称 (ACS580)，请按 (下一步) 直接进入电机额定值的设置。 有关编辑文字的更多信息，请参阅 <i>ACS580 firmware manual</i> (固件手册) 3AXD50000016097 [英语]。	
电机的下列额定值设置请参考电机铭牌。完全按照电机铭牌所示输入值。		
感应 (异步) 电机铭牌示例：		
☐	检查确认电机数据正确。这些值是根据传动规格预先定义的，但是您应该确认它们与电机对应。 从输入电机类型开始。 电机额定功率因数和额定转矩是选填项目。 按 (下一个) 继续。	

R0-
R9

ZH

R0-R9	☐ 此步骤是可选的，要求转动电机。如果这可能会导致任何风险或者机械设置不允许此动作，请勿执行此操作。 要执行方向测试，选择转动电机并按  (下一个)。	本地 ACS580 0.0 Hz 方向测试? 旋转电机来测试方向? 稍后 旋转电机 返回08:29下一个
	☐ 在面板上按启动键 ，启动传动。	本地 ACS580 5.0 Hz 按下启动按钮 警告：在设置完成前，安全措施无效，电机速度为5Hz。 按下启动按钮转动电机，然后检查旋转方向。 返回08:30
	☐ 检查电机的转动方向。 如果是正向，选择是的，电机正在正向旋转并按  (下一个) 继续。 如果不是正向，选择不，修改方向并按  (下一个) 继续。	本地 ACS580 5.0 Hz 是正转吗? 选择“不”，修改方向”告诉传动改变方向，并将新方向定义为“正向”。 是的，电机正在正向旋转 不，修改方向 返回08:30下一个
	☐ 如果希望对已经做的设置进行备份，选择备份并按  (下一个)。 如果不希望制作备份，选择稍后并按  (下一个)。	本地 ACS580 0.0 Hz 制作备份? 复制所有设定到控制盘中的一个备份文件中。还原备份，选择菜单>备份。 稍后 备份 返回08:42下一个
	☐ 首次启动到此完成，传动已经可以使用了。 按  (完成) 进入主页视图。	本地 ACS580 0.0 Hz 首次启动完成 传动准备好使用。 启动/停止：DI1 方向：DI2 给定（频率）：AI1换算值 返回08:42完成

☐	主页视图会显示面板上显示的所选信号的值。	
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R0-
R9



2 – 其他设置，初始设置菜单

☐	进行任何其他设置，例如宏、斜坡以及限值，从主菜单开始 – 按 (菜单) 进入主菜单。 选择初始设置并按 (选择) (或)。 我们建议您至少进行这些附加设置。 • 选择宏或分别设置启动、停止和给定值。 • 斜坡 • 限值 在初始设置菜单，您还可以调节与电机、PID、现场总线、高级功能、时钟、区域和显示等相关的设置。此外，此菜单还包含选项可以重置面板的主页视图。 如需了解初始设置菜单项目的更多信息，请按 打开帮助页面。	
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2 – 其他设置：启动、停止和给定值

☐	如果您不想使用宏，可以定义启动、停止和参照的设置： 选择启动、停止、给定值并按 (选择) (或)。	
--------------------------	---	--

根据需要设置参数。 选择一个参数，根据参数类型，按  (编辑) 或按  (选择) (或 )。 当修改设置时，您还可以修改传动中 I/O 信号的使用。确保实际 I/O 接线和 I/O 在控制程序中的使用相互匹配。您可以在主菜单下的 I/O 菜单检查当前 I/O 使用情况。 进行调节后，按  (返回) 返回初始设置。	本地 ACS580 0.0 Hz 启动/停止/给定值 给定源: AI1 AI1 换算 启动/停止/方向源: DI1 启动/... 控制地2 关断 恒定频率 开通 返回 08:43 编辑
--	--

R0-R9



2 – 其他设置：斜坡
(电机的加速和减速时间)

选择斜坡并按  (选择) (或 )。	本地 ACS580 0.0 Hz 初始设置 宏: ABB 标准宏 电机 启动/停止/给定值 斜坡 限值 返回 08:43 选择
根据需要设置参数。 选择一个参数并按  (编辑)。 进行调节后，按  (返回) 返回初始设置。	本地 ACS580 0.0 Hz 斜坡 加速时间: 20.000 s 减速时间: 20.000 s 曲线时间: 0.100 s 停止模式: 自由停车 使用两个斜坡设置 返回 08:43 编辑

2 – 其他设置：限值

选择限值并按  (选择) (或 )。	本地 ACS580 0.0 Hz 初始设置 宏: ABB 标准宏 电机 启动/停止/给定值 斜坡 限值 返回 08:43 选择
---	---

根据需要设置参数。

选择一个参数并按  (编辑)。

进行调节后，按  (返回) 返回初始设置。

本地  ACS580  0.0 Hz

限值

最小频率:-50.00 Hz

最大频率:50.00 Hz

最大电流:3.24 A

返回08:43编辑

R0-
R9



R0-
R9



EN – R0...R4 Quick installation guide

This guide briefly describes how to install and start-up the drive. For complete information on installation, see *ACS580-01 (0.75 to 250 kW) hardware manual* (3AXD50000018826 [English]). For start-up instructions, see chapter [EN – Quick start-up guide](#) on page 61.

To read a manual, go to www.abb.com/drives/documents and search for the document number.

Obey the safety instructions



WARNING! Obey these instructions. If you ignore them, injury or death, or damage to the equipment can occur:

- If you are not a qualified electrician, do not do electrical installation work.
- Do not work on the drive, motor cable or motor when main power is applied. If the drive is already connected to the input power, wait for 5 minutes after disconnecting the input power.
- Do not work on the control cables when power is applied to the drive or to the external control circuits.
- Make sure that debris from borings and grindings does not enter the drive when installing.
- Make sure that the floor below the drive and the wall where the drive is installed are non-flammable.

Check if capacitors need to be reformed

If the drive has not been powered (either in storage or unused) for over one year, you must reform the capacitors.

You can determine the manufacturing time from the serial number, which you find on the type designation label attached to the drive. The serial number is of format MYYWWRXXXX. YY and WW tell the manufacturing year and week as follows:

YY: 13, 14, 15, ... for 2013, 2014, 2015, ...

WW: 01, 02, 03, ... for week 1, week 2, week 3, ...

For information on reforming the capacitors, see *Converter module capacitor reforming instructions* (3BFE64059629 [English]), available on the Internet at www.abb.com/drives/documents.

R0-
R4

EN

Select the power cables

Size the power cables according to local regulations to carry the nominal current given on the type designation label of your drive.

R0-
R4

Ensure the cooling

See table [I](#) on page [425](#) (UL: table [II](#) on page [425](#)) for the losses. The allowed operating temperature range of the drive is -15 to +50 °C (+5 to +122 °F). No condensation or frost is allowed. For more information on the ambient temperature and derating, see chapter *Technical data* in *ACS580-01 (0.75 to 250 kW) hardware manual* (3AXD50000018826 [English]).

Protect the drive and input power cable

EN

See tables [III](#) (on page [426](#)) and [IV](#) (on page [426](#)); (UL: table [V](#) on page [427](#)) for the fuses.

If you use gG fuses, make sure that the operating time of the fuse is below 0.5 seconds. Follow the local regulations.

Install the drive on the wall

See figure [R0...R4 Figures A](#) on page [71](#).

Check the insulation of the power cables and the motor

Check the insulation of the input cable according to local regulations before connecting it to the drive.

See figure [B1](#) on page [71](#).

1. Check the insulation of the motor cable and motor when the cable is disconnected from the drive. Measure the insulation resistance between each phase conductor and then between each phase conductor and the Protective Earth conductor using a measuring voltage of 1000 V DC. The insulation resistance of an ABB motor must exceed 100 Mohm (reference value at 25 °C or 77 °F). For the insulation resistance of other motors, see the manufacturer's instructions.

Note: Moisture inside the motor casing will reduce the insulation resistance. If moisture is suspected, dry the motor and repeat the measurement.

Switch off the power and open the cover

See figure [B1](#) on page [71](#).

2. Switch off the power from the drive.
3. Remove the front cover: Loosen the retaining screw with a screwdriver (3a) and lift the cover from the bottom outwards (3b) and then up (3c).

**R0-
R4**

Check the compatibility with IT (ungrounded) and corner-grounded TN systems

EMC filter

The internal EMC filter is not suitable for use on an IT (ungrounded) system or on a corner-grounded TN system. Disconnect the EMC filter before connecting the drive to the supply network. Check the table on page [44](#).

EN



WARNING! Do not install the drive with the internal EMC filter connected on an IT system (an ungrounded power system or a high-resistance-grounded [over 30 ohms] power system), otherwise the system will be connected to ground potential through the EMC filter capacitors of the drive. This can cause danger, or damage the drive.

Do not install the drive with the internal EMC filter connected on a corner-grounded TN system, otherwise the drive will be damaged.

Note: When the internal EMC filter is disconnected, the drive EMC compatibility is considerably reduced.

Ground-to-phase varistor

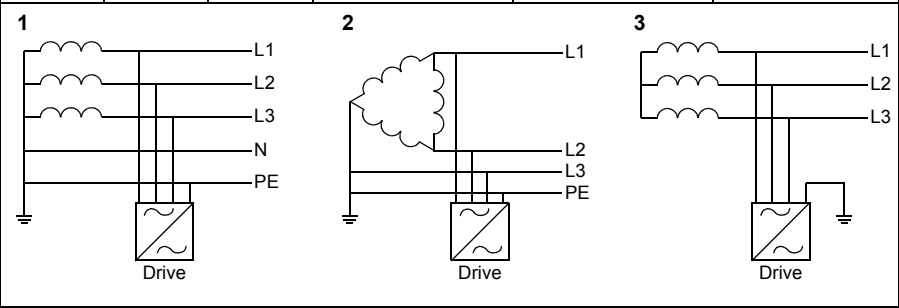
The ground-to-phase varistor is not suitable for use on an IT (ungrounded) system. Disconnect the ground-to-phase varistor before connecting the drive to the supply network. Check the table on page [44](#).



WARNING! Do not install the drive with the ground-to-phase varistor connected on an IT system (an ungrounded power system or a high-resistance-grounded [over 30 ohms] power system), otherwise the varistor circuit can be damaged.

Check from the table below if you have to disconnect the EMC filter (EMC) or ground-to-phase varistor (VAR). For instructions on how to do this, see page 45.

	Frame sizes	EMC filter (EMC)	Ground-to-phase varistor (VAR)	Symmetrically grounded TN systems (TN-S systems) ¹	Corner grounded TN systems ²	IT systems (ungrounded or high-resistance grounded [$>30\text{ ohms}$]) ³
R0-R4	R0...R3	EMC (1 switch)	-	Do not disconnect	Disconnect	Disconnect
		-	VAR (1 switch)	Do not disconnect	Do not disconnect	Disconnect
EN	R4	EMC (2 screws)	-	Do not disconnect	Frame R4 cannot be used in corner grounded TN systems.	Disconnect
		-	VAR (1 screw)	Do not disconnect		Disconnect



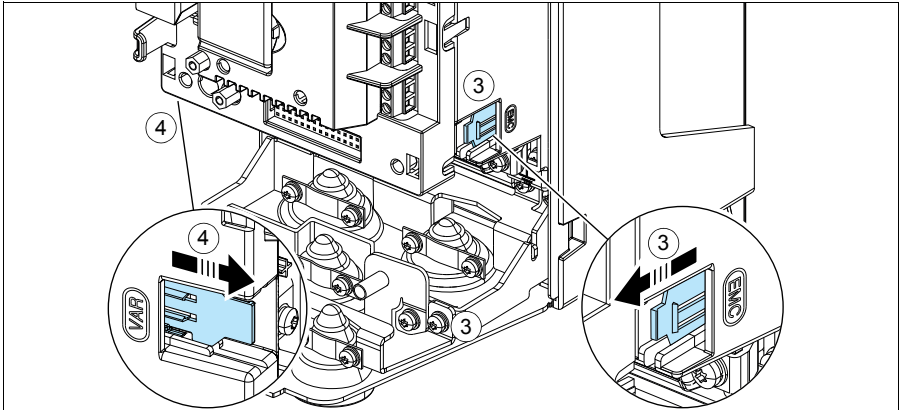
■ Disconnect EMC filter or ground-to-phase varistor, if needed

To disconnect the internal EMC filter or ground-to-phase varistor, if needed, do as follows:

1. Switch off the power from the drive.
2. Open the front cover, if not already opened, see figure [B1](#) on page [71](#).
3. R0...R3: To disconnect the internal EMC filter, slide the EMC switch in the direction shown by the arrow.
R4: To disconnect the internal EMC filter, remove the two EMC screws.
4. R0...R3: To disconnect the ground-to-phase varistor, slide the varistor switch in the direction shown by the arrow.
R4: To disconnect the ground-to-phase varistor, remove the varistor screw.

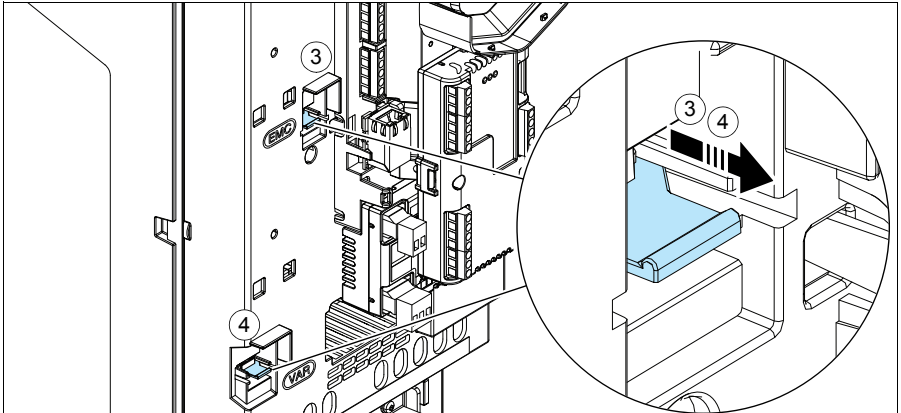
R0-
R4

R0...R2



EN

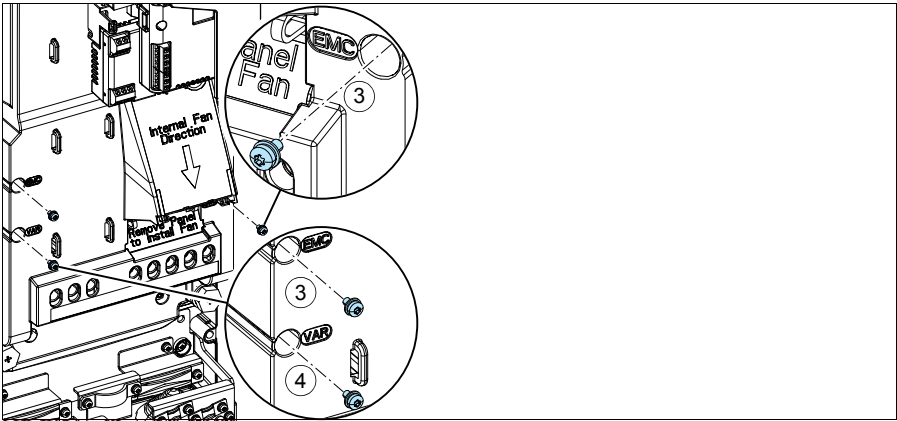
R3



R4

R0-
R4

EN



Connect the power cables

See figures [C1](#) (page [71](#)), [C2](#), [D](#), [E](#), [F1](#), [F2](#), [G1](#) and [G2](#).

1. Remove the rubber grommets from the lead-through plate.

Use symmetrical shielded cable for motor cabling. If the cable shield is the sole PE conductor for drive or motor, make sure that it has sufficient conductivity for the PE.

2. Cut an adequate hole into the rubber grommet. Slide the grommet onto the cable.

3. Prepare the ends of the motor cable as illustrated in figures 3a and 3b (two different motor cable types are shown). **Note:** The bare shield will be grounded 360 degrees. Mark the pigtail made from the shield as a PE conductor with yellow-and-green color.

4. Slide the cable through the hole of the bottom plate and attach the grommet to the hole.

5. Connect the motor cable:
 - Ground the shield 360 degrees by tightening the clamp of the power cable grounding shelf onto the stripped part of the cable (5a).
 - Connect the twisted shield of the cable to the grounding terminal (5b).
 - Connect the phase conductors of the cable to the T1/U, T2/V and T3/W terminals (5c). Tighten the screws to the torque given in the figure.

6. Repeat steps [2...4](#) for the input power cable.

7. Connect the input power cable. Connect the additional PE conductor of the cable (7c). Tighten the screws to the torque given in the figure.

8. Install the grounding shelf for the brake resistor cable.

9. Repeat steps [2...4](#) for the brake resistor cable (if used). Cut off extra phase conductors (if any).

10. Connect the resistor cable (if used). Tighten the screws to the torque given in the figure.

11. Install the grounding shelf for the control cables.

12. Put the unused rubber grommets to the holes in the lead-through plate.

13. Secure the cables outside the unit mechanically.

14. Ground the motor cable shield at the motor end. For minimum radio frequency interference, ground the motor cable shield 360 degrees at the lead-through of the motor terminal box.

R0-R4

EN

Connect the control cables

See figure [R0...R4 Figures H](#) on page [73](#). It shows an example with one analog signal cable and one digital signal cable. Make the connections according to the macro in use. The default connections of the ABB standard macro are shown in section [Default I/O connections](#) on page [49](#).

**R0-
R4**

4. Remove the front cover, if not already removed. See section [Switch off the power and open the cover](#) on page [43](#).

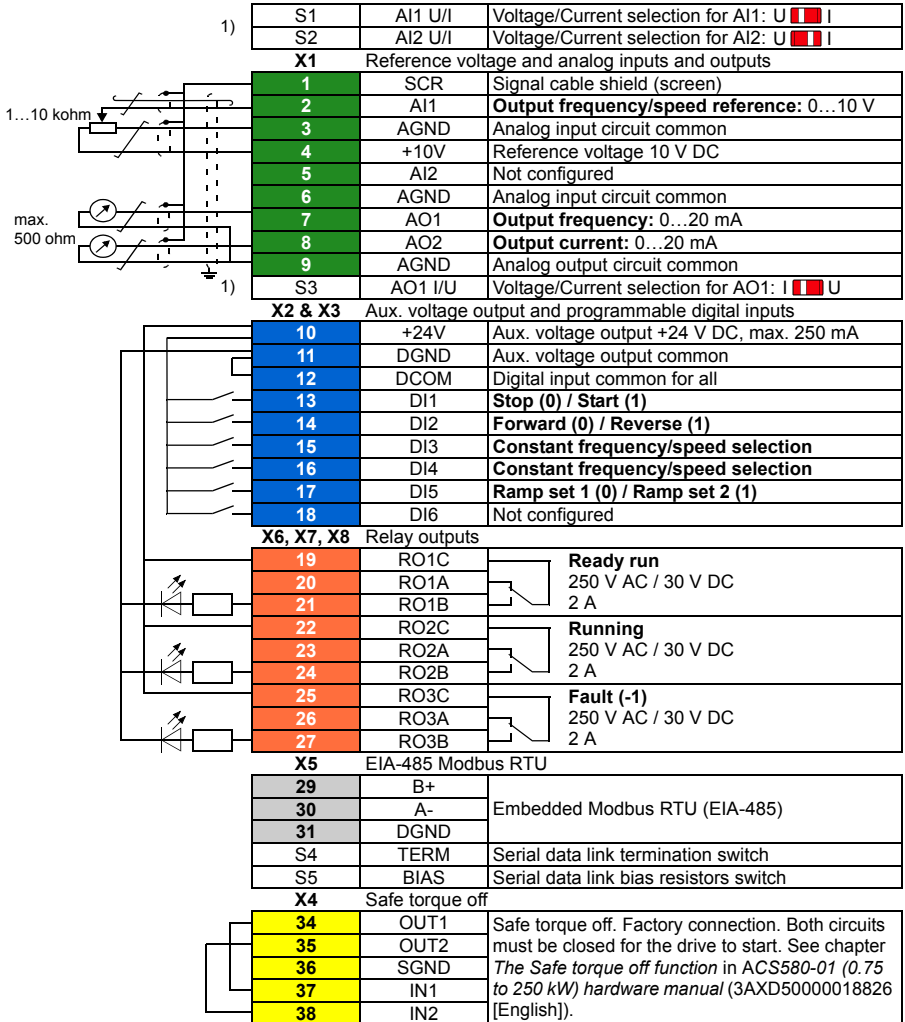
Example of connecting an analog signal cable:

5. Cut an adequate hole into the rubber grommet and slide the grommet onto the cable. Slide the cable through a hole of the bottom plate and attach the grommet to the hole.
6. Ground the outer shield of the cable 360 degrees under the grounding clamp. Keep the cable unstripped as close to the terminals of the control board as possible. Ground also the pair-cable shields and grounding wire at the SCR1 terminal.
7. Route the cable as shown in the figure.
8. Connect the conductors to the appropriate terminals of the control board and tighten to 0.5...0.6 N·m (0.4 lbf·ft).
9. Tie all control cables to the provided cable tie mounts.

EN

Default I/O connections

Default I/O connections of the ABB Standard macro are shown below.



1) All control boards do not have switches S1, S2 and S3. In that case, select voltage or current for inputs AI1 and AI2 and output AO1 with parameters. See the firmware manual.
Total load capacity of the Auxiliary voltage output +24V (X2:10) is 6.0 W (250 mA / 24 V DC).

Wire sizes:

0.2...2.5 mm² (24...14 AWG): Terminals +24V, DGND, DCOM, B+, A-, DGND, Ext. 24V

0.14...1.5 mm² (26...16 AWG): Terminals DI, AI, AO, AGND, RO, STO

Tightening torques: 0.5...0.6 N·m (0.4 lbf·ft)

Install optional modules, if any

See chapter *Electrical installation* in *ACS580-01 (0.75 to 250 kW) hardware manual* (3AXD50000018826 [English]).

R0-
R4

Reinstall cover

See figure [H](#) on page [78](#).

1. Put the tabs on the inside of the cover top in their counterparts on the housing (1a) and then press the cover at the bottom (1b).
2. Tighten the retaining screw with a screwdriver.

EN

For start-up instructions, see chapter [EN – Quick start-up guide](#) on page [61](#).

EN – R5 Quick installation guide

This guide briefly describes how to install and start-up the drive. For complete information on installation, see *ACS580-01 (0.75 to 250 kW) hardware manual* (3AXD50000018826 [English]). For start-up instructions, see chapter [EN – Quick start-up guide](#) on page 61.

To read a manual, go to www.abb.com/drives/documents and search for the document number.

R5

Obey the safety instructions



WARNING! Obey these instructions. If you ignore them, injury or death, or damage to the equipment can occur:

- If you are not a qualified electrician, do not do electrical installation work.
- Do not work on the drive, motor cable or motor when main power is applied. If the drive is already connected to the input power, wait for 5 minutes after disconnecting the input power.
- Do not work on the control cables when power is applied to the drive or to the external control circuits.
- Make sure that debris from borings and grindings does not enter the drive when installing.
- Make sure that the floor below the drive and the wall where the drive is installed are non-flammable.

EN

Check if capacitors need to be reformed

If the drive has not been powered (either in storage or unused) for over one year, you must reform the capacitors.

You can determine the manufacturing time from the serial number, which you find on the type designation label attached to the drive. The serial number is of format MYYWWRXXXX. YY and WW tell the manufacturing year and week as follows:

YY: 13, 14, 15, ... for 2013, 2014, 2015, ...

WW: 01, 02, 03, ... for week 1, week 2, week 3, ...

For information on reforming the capacitors, see *Converter module capacitor reforming instructions* (3BFE64059629 [English]), available on the Internet at www.abb.com/drives/documents.

Select the power cables

Size the power cables according to local regulations to carry the nominal current given on the type designation label of your drive.

Ensure the cooling

R5

See table [I](#) on page [429](#) (UL: table [II](#) on page [429](#)) for the losses. The allowed operating temperature range of the drive is -15 to +50 °C (+5 to +122 °F). No condensation or frost is allowed. For more information on the ambient temperature and derating, see chapter *Technical data* in *ACS580-01 (0.75 to 250 kW) hardware manual* (3AXD50000018826 [English]).

Protect the drive and input power cable

EN

See tables [III](#) (on page [429](#)) and [IV](#) (on page [429](#)); (UL: table [V](#) on page [430](#)) for the fuses.

If you use gG fuses, make sure that the operating time of the fuse is below 0.5 seconds. Follow the local regulations.

Install the drive on the wall

See figure [R5 Figures A](#) on page [75](#).

Check the insulation of the power cables and the motor

Check the insulation of the input cable according to local regulations before connecting it to the drive.

See figure [B](#) on page [75](#).

1. Check the insulation of the motor cable and motor when the cable is disconnected from the drive. Measure the insulation resistance between each phase conductor and then between each phase conductor and the Protective Earth conductor using a measuring voltage of 1000 V DC. The insulation resistance of an ABB motor must exceed 100 Mohm (reference value at 25 °C or 77 °F). For the insulation resistance of other motors, see the manufacturer's instructions.

Note: Moisture inside the motor casing will reduce the insulation resistance. If moisture is suspected, dry the motor and repeat the measurement.

Switch off the power and open the cover

See figure [B](#) on page [75](#).

2. Switch off the power from the drive.
3. IP21, Remove the module cover: Loosen the retaining screws with a screwdriver (3a) and lift the cover from the bottom outwards (3b) and then up (3c).
4. IP21, Remove the box cover: Loosen the retaining screws with a screwdriver (4a) and slide the cover downwards (4b).
5. IP55, Remove the front cover: Loosen the retaining screws with a screwdriver (4a) and lift the cover from the bottom outwards (4b) and then up (4c).

R5

Check the compatibility with IT (ungrounded) and corner-grounded TN systems

EN

■ EMC filter

The internal EMC filter is not suitable for use on an IT (ungrounded) system or on a corner-grounded TN system. Disconnect the EMC filter before connecting the drive to the supply network. Check the table on page [54](#).



WARNING! Do not install the drive with the internal EMC filter connected on an IT system (an ungrounded power system or a high-resistance-grounded [over 30 ohms] power system), otherwise the system will be connected to ground potential through the EMC filter capacitors of the drive. This can cause danger, or damage the drive.

Do not install the drive with the internal EMC filter connected on a corner-grounded TN system, otherwise the drive will be damaged.

Note: When the internal EMC filter is disconnected, the drive EMC compatibility is considerably reduced.

■ Ground-to-phase varistor

The ground-to-phase varistor is not suitable for use on an IT (ungrounded) system. Disconnect the ground-to-phase varistor before connecting the drive to the supply network. Check the table on page [54](#).



WARNING! Do not install the drive with the ground-to-phase varistor connected on an IT system (an ungrounded power system or a high-resistance-grounded [over 30 ohms] power system), otherwise the varistor circuit can be damaged.

Check from the table below if you have to disconnect the EMC filter (EMC) or ground-to-phase varistor (VAR). For instructions on how to do this, see page 55.

Frame sizes	EMC filter (EMC)	Ground-to-phase varistor (VAR)	Symmetrically grounded TN systems (TN-S systems) ¹	Corner grounded TN systems ²	IT systems (ungrounded or high-resistance grounded [$>30\text{ ohms}$]) ³
R5	EMC (2 screws)	-	Do not disconnect	Frame R5 cannot be used in corner grounded TN systems.	Disconnect
	-	VAR (1 screw)	Do not disconnect		Disconnect

1

Diagram 1: Symmetrically grounded TN system (TN-S). Shows three phase lines (L1, L2, L3), a neutral line (N), and a protective earth line (PE). The PE line is connected to a ground symbol and a 'Drive' component. The EMC filter is connected to L1, L2, L3, and N. The VAR is connected to L1 and PE.

2

Diagram 2: Symmetrically grounded TN system (TN-S) with a fault. Similar to Diagram 1, but with a fault (cloud symbol) on the L1 line. The fault is connected to the PE line, which is grounded and connected to the 'Drive' component.

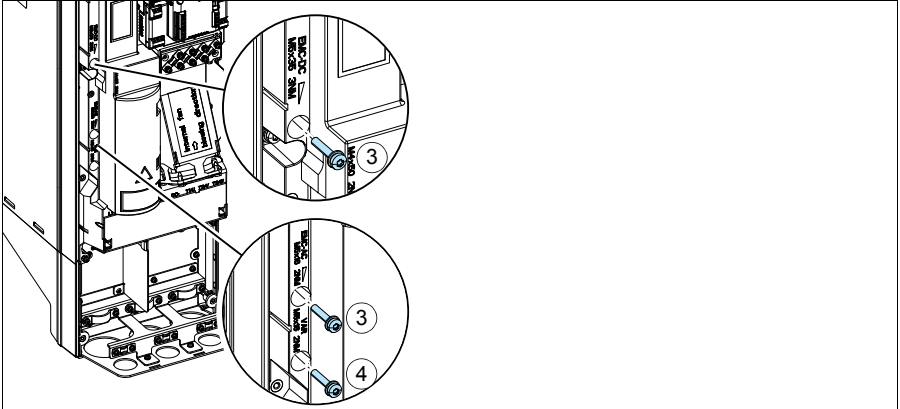
3

Diagram 3: Corner grounded TN system. Shows three phase lines (L1, L2, L3) and a PE line. The PE line is connected to a ground symbol and a 'Drive' component. The EMC filter is connected to L1, L2, and L3. The VAR is connected to L1 and PE.

■ Disconnect EMC filter or ground-to-phase varistor, if needed

To disconnect the internal EMC filter or ground-to-phase varistor, if needed, do as follows:

1. Switch off the power from the drive.
2. Open the front cover, if not already opened, see figure [B](#) on page [75](#).
3. To disconnect the internal EMC filter, remove the two EMC screws.
4. To disconnect the ground-to-phase varistor, remove the varistor screw.



R5

EN

Connect the power cables

See figures [C](#) (page [76](#)), [D](#) and [E](#).

1. Attach the residual voltage warning sticker in the local language next to the control board.
2. Remove the shroud on the power cable terminals by releasing the clips with a screwdriver and pulling the shroud out.

R5

Use symmetrical shielded cable for motor cabling. If the cable shield is the sole PE conductor for drive or motor, make sure that it has sufficient conductivity for the PE.

3. Cut an adequate hole into the rubber grommet. Slide the grommet onto the cable.
4. Prepare the ends of the motor cable as illustrated in figures 4a and 4b (two different motor cable types are shown). **Note:** The bare shield will be grounded 360 degrees. Mark the pigtail made from the shield as a PE conductor with yellow-and-green color.

EN

5. Slide the cable through the hole of the bottom plate and attach the grommet to the hole.
6. Connect the motor cable:
 - Ground the shield 360 degrees by tightening the clamp of the power cable grounding shelf onto the stripped part of the cable (6a).
 - Connect the twisted shield of the cable to the grounding terminal (6b).
 - Connect the phase conductors of the cable to the T1/U, T2/V and T3/W terminals (6c). Tighten the screws to the torque given in the figure.
7. Repeat steps [3...5](#) for the input power cable.
8. Connect the input power cable. Tighten the screws to the torque given in the figure.
9. Install the cable box plate. Position the plate and tighten the screw.
10. Reinstall the shroud on the power terminals by putting the tabs at the top of the shroud in their counterparts on the drive frame and then pressing the shroud in place.
11. Secure the cables outside the unit mechanically.
12. See figure [R5 Figures F](#) (page [77](#)). Ground the motor cable shield at the motor end. For minimum radio frequency interference, ground the motor cable shield 360 degrees at the lead-through of the motor terminal box.

Connect the control cables

See figure [H](#) on page [78](#). It shows an example with one analog signal cable and one digital signal cable. Make the connections according to the macro in use. The default connections of the ABB standard macro are shown in section [Default I/O connections](#) on page [58](#).

3. Remove the front cover, if not already removed. See section [Switch off the power and open the cover](#) on page [53](#).

R5

Example of connecting an analog signal cable:

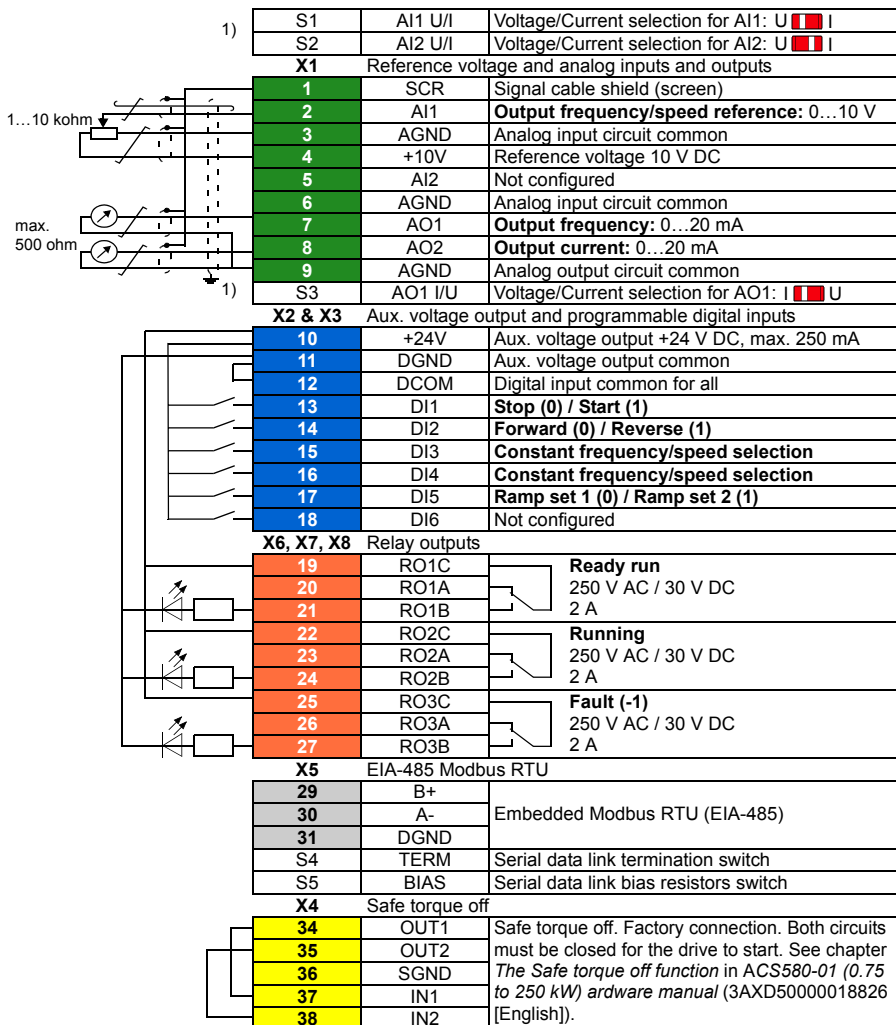
4. Cut an adequate hole into the rubber grommet and slide the grommet onto the cable. Slide the cable through a hole of the bottom plate and attach the grommet to the hole.
5. Ground the outer shield of the cable 360 degrees under the grounding clamp. Keep the cable unstripped as close to the terminals of the control board as possible. Ground also the pair-cable shields and grounding wire at the SCR1 terminal.
6. Route the cable as shown in the figure.
7. Connect the conductors to the appropriate terminals of the control board and tighten to 0.5...0.6 N·m (0.4 lbf·ft).
8. Tie all control cables to the provided cable tie mounts.

EN

Default I/O connections

Default I/O connections of the ABB Standard macro are shown below.

R5



EN

1) All control boards do not have switches S1, S2 and S3. In that case, select voltage or current for inputs AI1 and AI2 and output AO1 with parameters. See the firmware manual.
Total load capacity of the Auxiliary voltage output +24V (X2:10) is 6.0 W (250 mA / 24 V DC).

Wire sizes:

0.2...2.5 mm² (24...14 AWG): Terminals +24V, DGND, DCOM, B+, A-, DGND, Ext. 24V

0.14...1.5 mm² (26...16 AWG): Terminals DI, AI, AO, AGND, RO, STO

Tightening torques: 0.5...0.6 N·m (0.4 lbf·ft)

Install optional modules, if any

See chapter *Electrical installation* in ACS580-01 (0.75 to 250 kW) hardware manual (3AXD50000018826 [English]).

Reinstall cover

See figure [H](#) on page [78](#).

1. IP21, Reinstall the box cover: Slide the cover upwards (1a) and tighten the retaining screws (1b).
2. IP21, Reinstall the module cover: Put the tabs on the inside of the cover top in their counterparts on the housing (2a), press the cover at the bottom (2b) and tighten the retaining screws (2c).
3. IP55, Reinstall the front cover: Put the tabs on the inside of the cover top in their counterparts on the housing (3a), press the cover at the bottom (3a) and tighten the retaining screws (3b).

For start-up instructions, see chapter [EN – Quick start-up guide](#) on page [61](#).

R5

EN

R5

EN

EN – Quick start-up guide

This guide describes how to start-up the drive using the First start assistant on the assistant control panel.

Before you start

Ensure that the drive has been installed as described in chapter [EN – R0...R4 Quick installation guide](#) on page 41 (frames R0...R4) or in chapter [EN – R5 Quick installation guide](#) page 51 (frame R5).

R0-
R9



Start-up with the First start assistant on an assistant control panel

EN

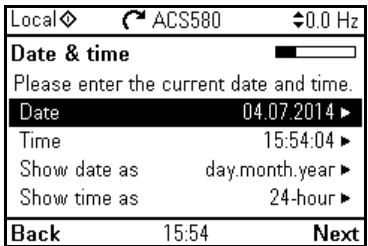
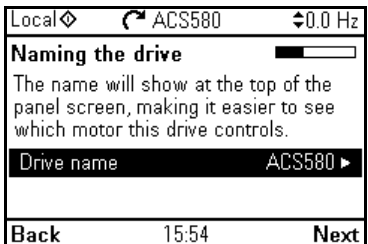
Safety	
☐	Make sure that the installation work is complete. Make sure that cover of the drive and the cable box, if included, are on place.
☐	 Check that the starting of the motor does not cause any danger. De-couple the driven machine if there is a risk of damage in case of an incorrect direction of rotation.
Hints on using the assistant control panel	
The two commands at the bottom of the display (Options and Menu in the figure on the right), show the functions of the two softkeys  and  located below the display. The commands assigned to the softkeys vary depending on the context. Use keys , ,  and  to move the cursor and/or change values depending on the active view. Key  shows a context-sensitive help page.	
1 – First start assistant guided settings: Language, date and time, and motor nominal values	
☐	Have the motor name plate data at hand. Power up the drive.

R0-
R9



EN

☐	The First start assistant guides you through the first start-up. The assistant begins automatically. Wait until the control panel enters the view shown on the right. Select the language you want to use by highlighting it (if not already highlighted) and pressing (OK). Note: After you have selected the language, it takes a few minutes for the control panel to wake up.	
☐	Select Start set-up and press (Next).	
☐	Select the localization you want to use and press (Next).	
☐	Change the units shown on the panel if needed. • Go to the edit view of a selected row by pressing . • Scroll the view with and . Go to the next view by pressing (Next).	
☐	To select a value in an edit view: • Use and to select the value. Press (Save) to accept the new setting, or press (Cancel) to go back to the previous view without making changes.	

☐	Set the date and time as well as date and time display formats. - Go to the edit view of a selected row by pressing . - Scroll the view with  and . Go to the next view by pressing  (Next).	
☐	To change a value in an edit view: - Use  and  to move the cursor left and right. - Use  and  to change the value. - Press  (Save) to accept the new setting, or press  (Cancel) to go back to the previous view without making changes.	
☐	To give the drive a name that will be shown at the top, press . If you do not want to change the default name (ACS580), continue straight to the set-up of the motor nominal values by pressing  (Next). For information on editing text, see ACS580 <i>firmware manual</i> (3AXD50000016097 [English]).	

Refer to the motor nameplate for the following nominal value settings of the motor. Enter the values exactly as shown on the motor nameplate.

Example of a nameplate of an induction (asynchronous) motor:

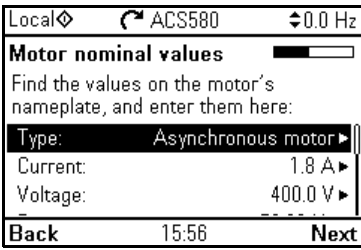
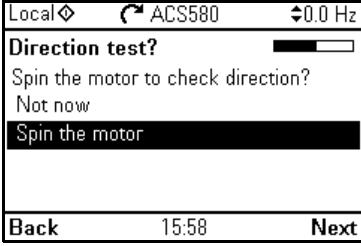
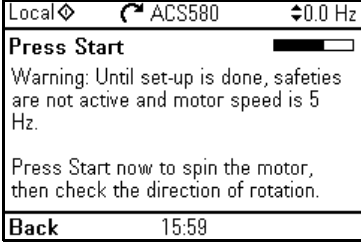
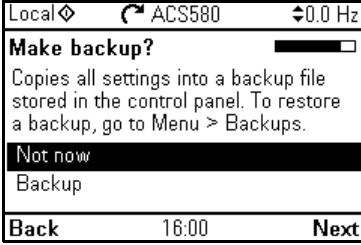
		ABB Motors									
3 ~ motor		M2AA 200 MLA 4									
		IEC 200 M/L 55									
				Ins.cl.		F		IP 55			
V	Hz	kW	r/min	A	cos φ	IA/IN		t/E/s			
690 Y	50	30	1475	32.5	0.83						
400 D	50	30	1475	56	0.83						
660 Y	50	30	1470	34	0.83						
380 D	50	30	1470	59	0.83						
415 D	50	30	1475	54	0.83						
440 D	60	35	1770	59	0.83						
Cat. no		3GAA 202 001 - ADA									
6312/C3				6210/C3		180		kg			
		IEC 34-1									
											

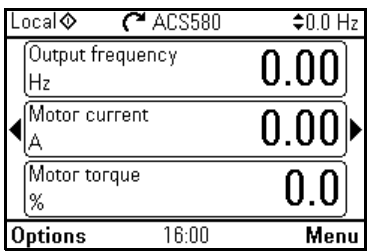
R0-
R9

EN

R0-
R9

EN

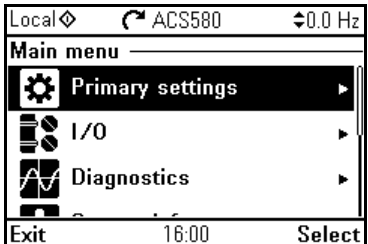
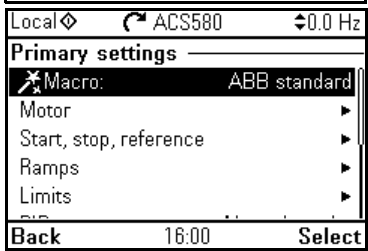
☐	Check that the motor data is correct. Values are predefined on the basis of the drive size but you should verify that they correspond to the motor. Start with the motor type. Motor nominal $\cos\Phi$ and nominal torque are optional. Press  (Next) to continue.	 Local  ACS580 $\updownarrow$ 0.0 Hz Motor nominal values Find the values on the motor's nameplate, and enter them here: Type: Asynchronous motor Current: 1.8 A Voltage: 400.0 V Back 15:56 Next
☐	This step is optional, and requires rotating the motor. Do not do this if it could cause any risk, or if the mechanical set-up does not allow it. To do the direction test, select Spin the motor and press  (Next).	 Local  ACS580 $\updownarrow$ 0.0 Hz Direction test? Spin the motor to check direction? Not now Spin the motor Back 15:58 Next
☐	Press the Start key  on the panel to start the drive.	 Local  ACS580 $\updownarrow$ 0.0 Hz Press Start Warning: Until set-up is done, safeties are not active and motor speed is 5 Hz. Press Start now to spin the motor, then check the direction of rotation. Back 15:59
☐	Check the direction of the motor. If it is forward, select Yes, motor is spinning forward and press  (Next) to continue. If the direction is not forward, select No, fix direction and press  (Next) to continue.	 Local  ACS580 $\updownarrow$ 5.0 Hz Is this forward? Selecting "No, fix direction" tells the drive to change direction, and labels the new direction "forward". Yes, motor is spinning forward No, fix direction Back 15:59 Next
☐	If you want to make a backup of the settings made so far, select Backup and press  (Next). If you do not want to make a backup, select Not now and press  (Next).	 Local  ACS580 $\updownarrow$ 0.0 Hz Make backup? Copies all settings into a backup file stored in the control panel. To restore a backup, go to Menu > Backups. Not now Backup Back 16:00 Next

☐	The first start is now complete and the drive is ready for use. Press  (Done) to enter the Home view.	
☐	The Home view monitoring the values of the selected signals is shown on the panel.	

R0-
R9

EN

2 – Additional settings in the Primary settings menu

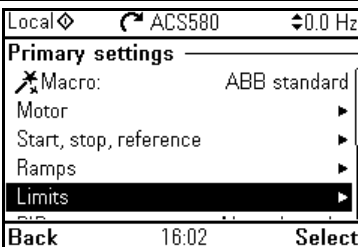
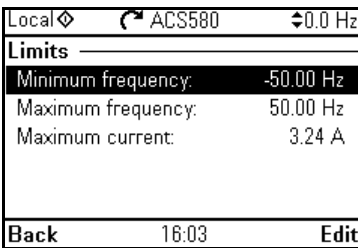
☐	Make any additional adjustments, for example macro, ramps and limits, starting from the Main menu – press  (Menu) to enter the Main menu. Select Primary settings and press  (Select) (or ). We recommend that you make at least these additional settings: • Choose a macro or set start, stop and reference values individually • Ramps • Limits With the Primary settings menu, you can also adjust settings related to the motor, PID, fieldbus, advanced functions and clock, region and display. In addition, the menu contains an item to reset the panel Home view. To get more information on the Primary settings menu items, press  to open the help page.	 
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2 – Additional settings: Start, stop and reference values

R0-R9	☐ If you do not wish to use a macro, define the settings for start, stop and reference: Select Start, stop, reference and press  (Select) (or ).	Local  ACS580 0.0 Hz Primary settings Macro: ABB standard Motor Start, stop, reference Ramps Limits Back 16:02 Select
EN	☐ Adjust the parameters according to your needs. Select a parameter and, depending on the parameter type, press  (Edit) or press  (Select) (or ). When you change the settings, you also change the use of the I/O signals in the drive. Make sure the actual I/O wiring and the use of I/O in the control program match each other. You can check the current I/O use in the I/O menu under the Main menu. After making the adjustments, go back to the Primary settings menu by pressing  (Back).	Local  ACS580 0.0 Hz Start, stop, reference Reference from: AI1 directly  AI1 scaling Start/stop/dir from: DI1 start/stop,... Secondary control location Off Constant frequencies On Back 16:02 Edit

2 – Additional settings: Ramps
(acceleration and deceleration times for the motor)

☐	Select Ramps and press  (Select) (or ).	Local  ACS580 0.0 Hz Primary settings Macro: ABB standard Motor Start, stop, reference Ramps Limits Back 16:02 Select
☐	Adjust the parameters according to your needs. Select a parameter and press  (Edit). After making the adjustments, go back to the Primary settings menu by pressing  (Back).	Local  ACS580 0.0 Hz Ramps Acceleration time: 20.000 s Deceleration time: 20.000 s Shape time: 0.100 s Stop mode: Coast ☒ Use two ramp sets Back 16:02 Edit

2 – Additional settings: Limits		
☐	Select Limits and press  (Select) (or ).	
☐	Adjust the parameters according to your needs. Select a parameter and press  (Edit). After making the adjustments, go back to the Primary settings menu by pressing  (Back).	

R0-
R9

EN



Compliance with the European Machinery Directive 2006/42/EC

Declaration of conformity



EU Declaration of Conformity

(According to Machinery Directive 2006/42/EC)

R5

We

Manufacturer: ABB Oy, Drives
Address: Hiomotie 13, P.O Box 184, 00381 Helsinki, Finland.

hereby declare that the product

ACS580-01 (frame sizes R0, R1, R2, R3, R4, R5, R6, R7, R8 and R9)

with regard to the following safety function

Safe torque off

fulfils all the relevant safety component requirements of EC Machinery Directive 2006/42/EC, when the listed safety function is used for safety component functionality.

The following harmonized standards below were used:

EN 61800-5-2: 2007	<i>Adjustable speed electrical power drive systems – Part 5-2: Safety requirements - Functional</i>
EN 62061: 2015	<i>Safety of machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems</i>
EN ISO 13849-1: 2008 + AC: 2009	<i>Safety of machinery – Safety-related parts of control systems. Part 1: General requirements</i>
EN ISO 13849-2: 2012	<i>Safety of machinery – Safety-related parts of the control systems. Part 2: Validation</i>
EN 60204-1:2006 + A1:2009 + AC:2010	<i>Safety of machinery – Electrical equipment of machines – Part 1: General requirements</i>

Other used standards:

IEC 61508 ed. 2: 2010	Functional safety of electrical / electronic / programmable electronic safety-related systems
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The products referred in this Declaration of Conformity fulfil the relevant provisions of the Low Voltage Directive 2006/95/EC and EMC Directive 2004/108/EC. Declaration of conformity according to these directives is available from the manufacturer.

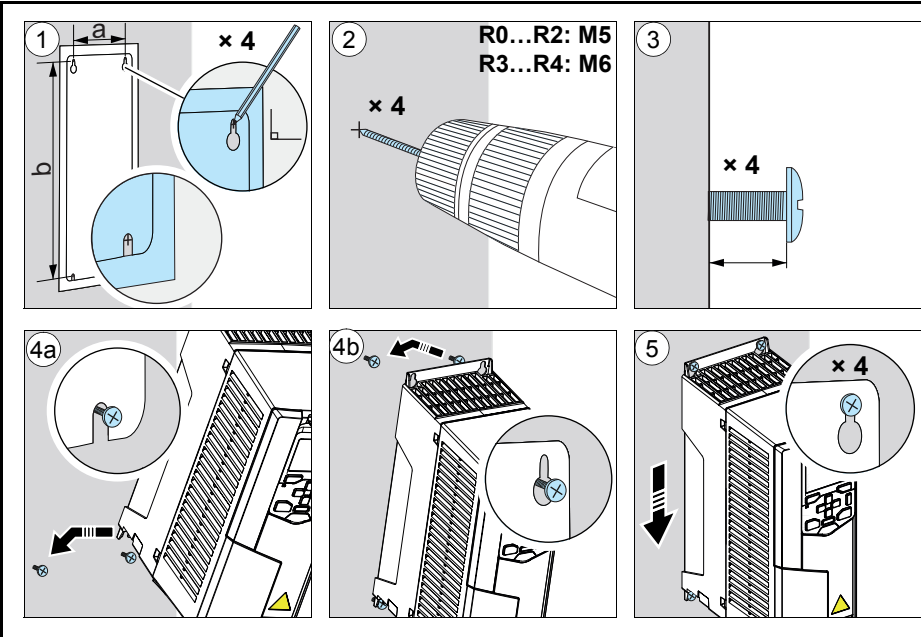
Person authorized to compile the technical file:

Name: Risto Mynttinen
Address: P.O. Box 184, FIN-00381 Helsinki, Finland

Helsinki, 2016-02-15

Tuomo Höysniemi
Vice President
ABB Oy

R0...R4 Figures A



B2

ONLY IT AND CORNER-GROUNDED TN SYSTEMS

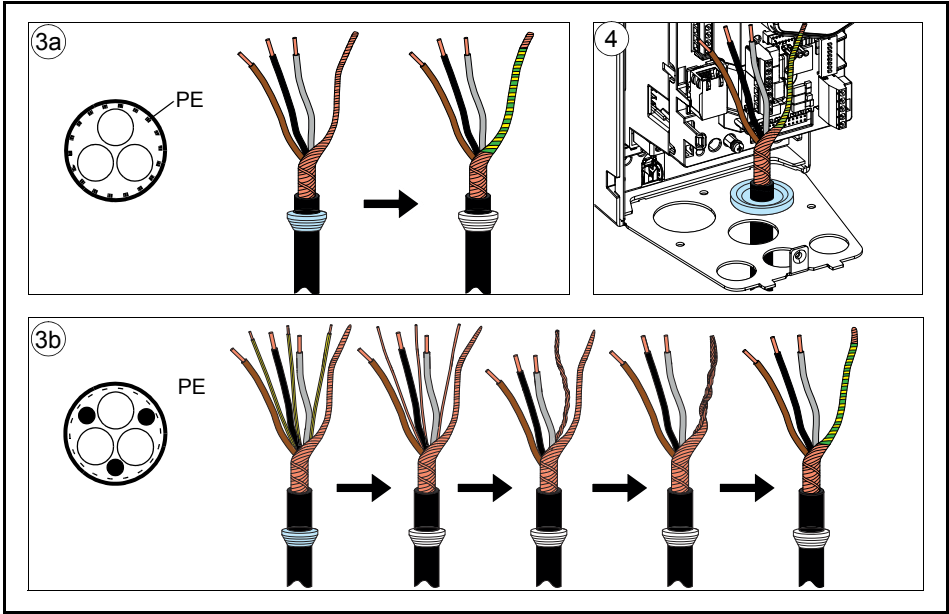
R0...R4

R0...R3

R4

EN: See page 43. DA: See page 35.
DE: Siehe Seite 45. ES: Véase la página 55.
FI: Katso sivu 65. FR: Cf. page 75.
IT: Vedere pag. 85. NL: Zie pagina 95.
PL: Patrz str. 105. PT: Veja a página 115.
RU: См. стр. 125. SV: Se sidan 135.
TR: Bkz. sayfa 145. ZH: 请参阅第 15.

C2



B1

1. 1000 V DC, ≥ 100 Mohm

U1-V1, U1-W1, V1-W1
U1-PE, V1-PE, W1-PE

IP21

IP55, R0...R2

IP55, R3

IP55, R4

R0...R1

R2

R3...R4

C1

ACS580-01 R0...R4

PE (PE) PE (PE) L1 L2 L3

UDC+ R- R+ T1/U T2/V T3/W

U1 V1 W1 3 ~ M

1. Mounting the unit with 4 screws.

2. Mounting the unit with 4 screws.

D

R0...R2

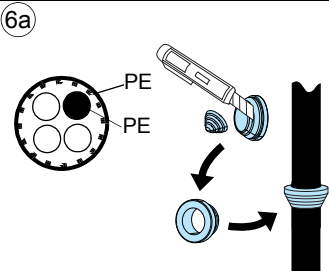
R3

R4

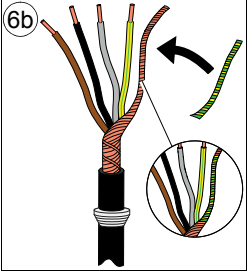
Frame size	R0...R1		R2	
	N-m	lbf-ft	N-m	lbf-ft
T1/U, T2/V, T3/W	0.5...0.6	0.4	1.2...1.5	1.1
PE, ⊕	1.5	1.1	1.5	1.1
⊕	1.2	0.9	1.2	0.9

Frame size	R3		R4	
	N-m	lbf-ft	N-m	lbf-ft
T1/U, T2/V, T3/W	2.5...4.5	3.3	4.0	3.0
PE, ⊕	1.5	1.1	2.9	2.1
⊕	1.2	0.9	1.2	0.9

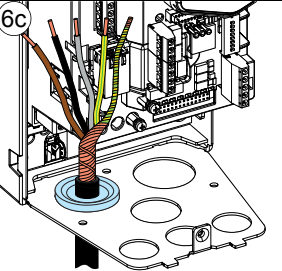
6a



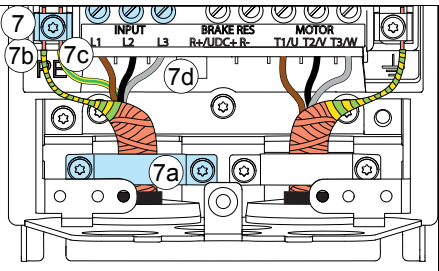
6b



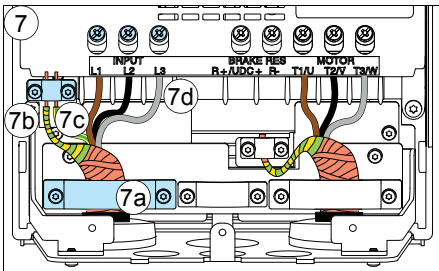
6c



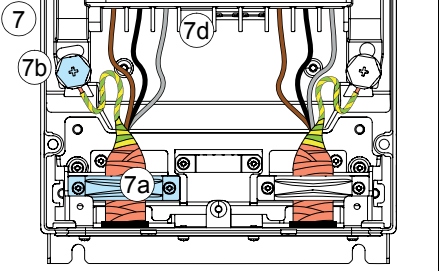
R0...R2



R3



R4

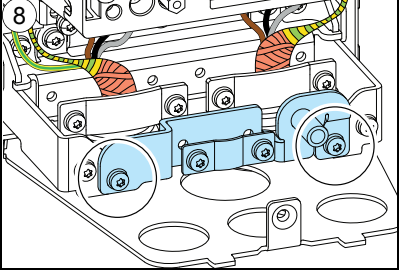


Frame size	R0...R1		R2	
	N·m	lbf·ft	N·m	lbf·ft
L1, L2, L3	0.5...0.6	0.4	1.2...1.5	1.1
PE, $\frac{1}{2}$	1.5	1.1	1.5	1.1
	1.2	0.9	1.2	0.9

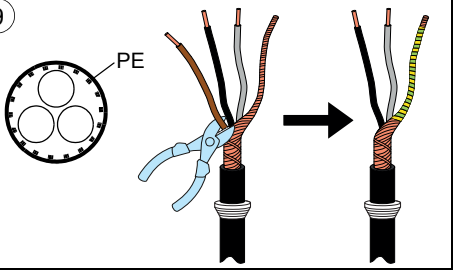
Frame size	R3		R4	
	N·m	lbf·ft	N·m	lbf·ft
L1, L2, L3	2.5...4.5	3.3	4.0	3.0
PE, $\frac{1}{2}$	1.5	1.1	2.9	2.1
	1.2	0.9	1.2	0.9

F1

R0...R3

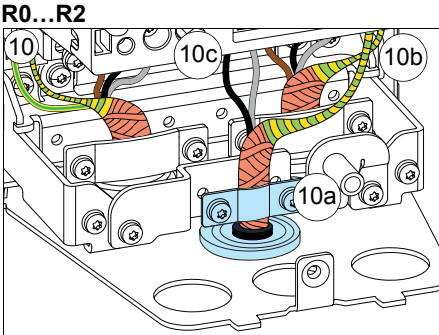


9

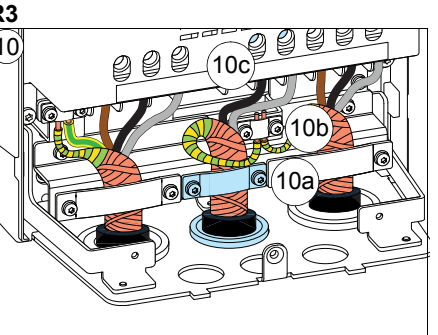


F2

R0...R2



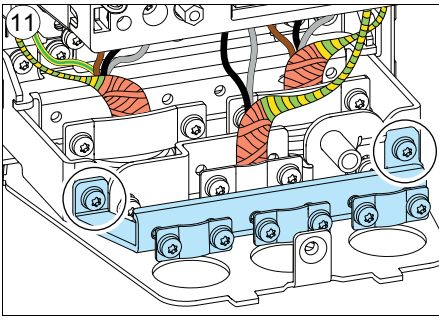
R3



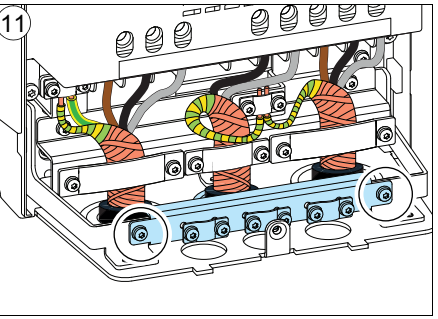
Frame size	R0...R1		R2		R3	
	N·m	lbf·ft	N·m	lbf·ft	N·m	lbf·ft
R-, R+	0.5...0.6	0.4	1.2...1.5	1.1	2.5...4.5	3.3
PE, $\frac{1}{2}$	1.5	1.1	1.5	1.1	1.5	1.1
	1.2	0.9	1.2	0.9	1.2	0.9

G1

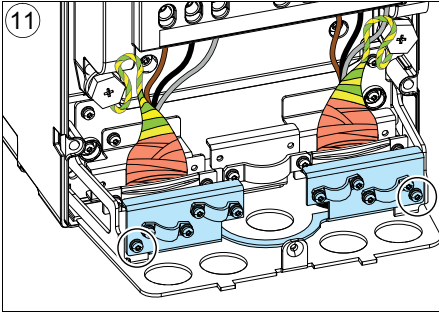
R0...R2



R3

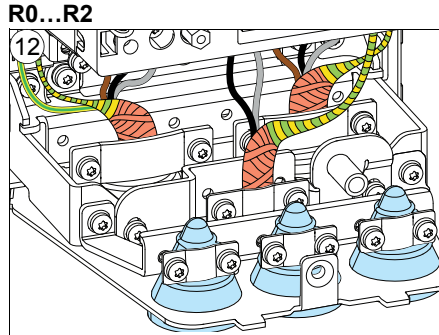


R4

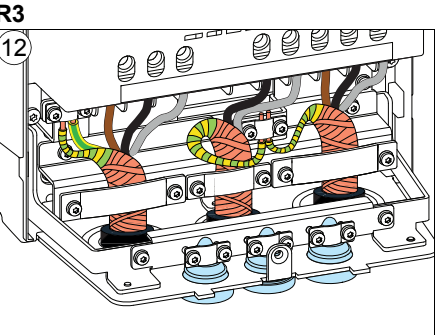


G2

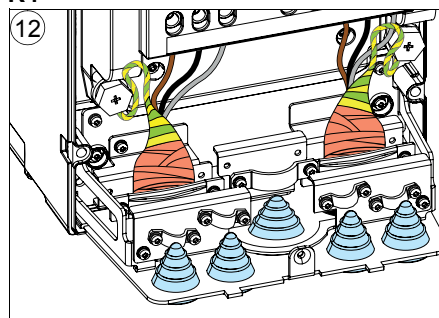
R0...R2



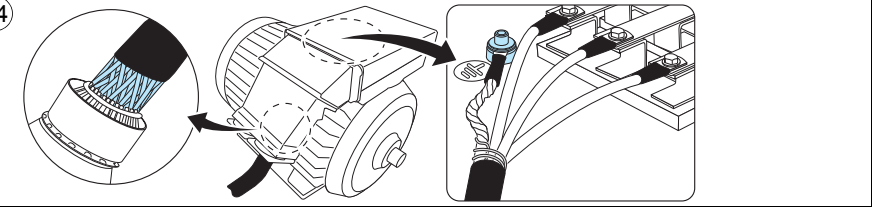
R3



R4

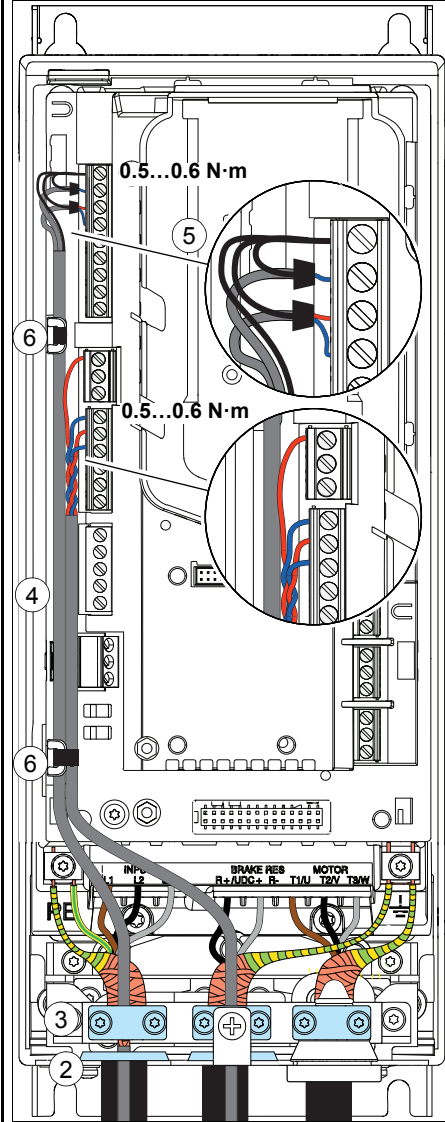


14

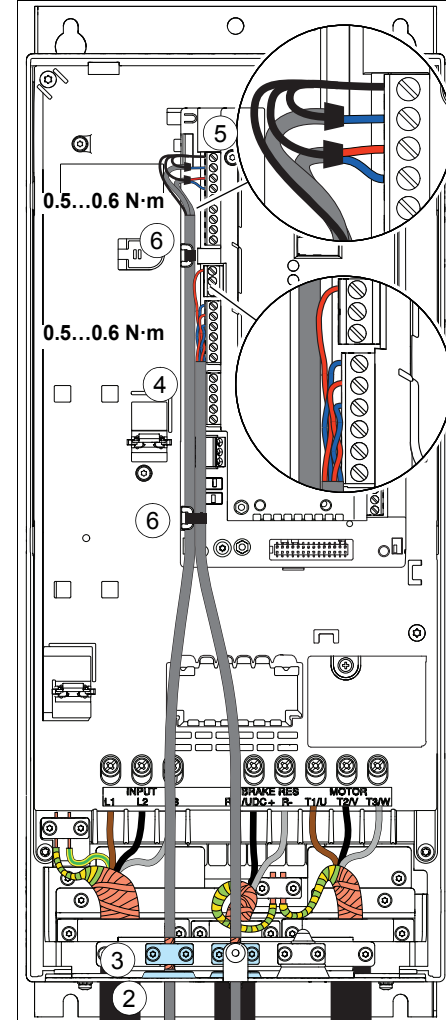




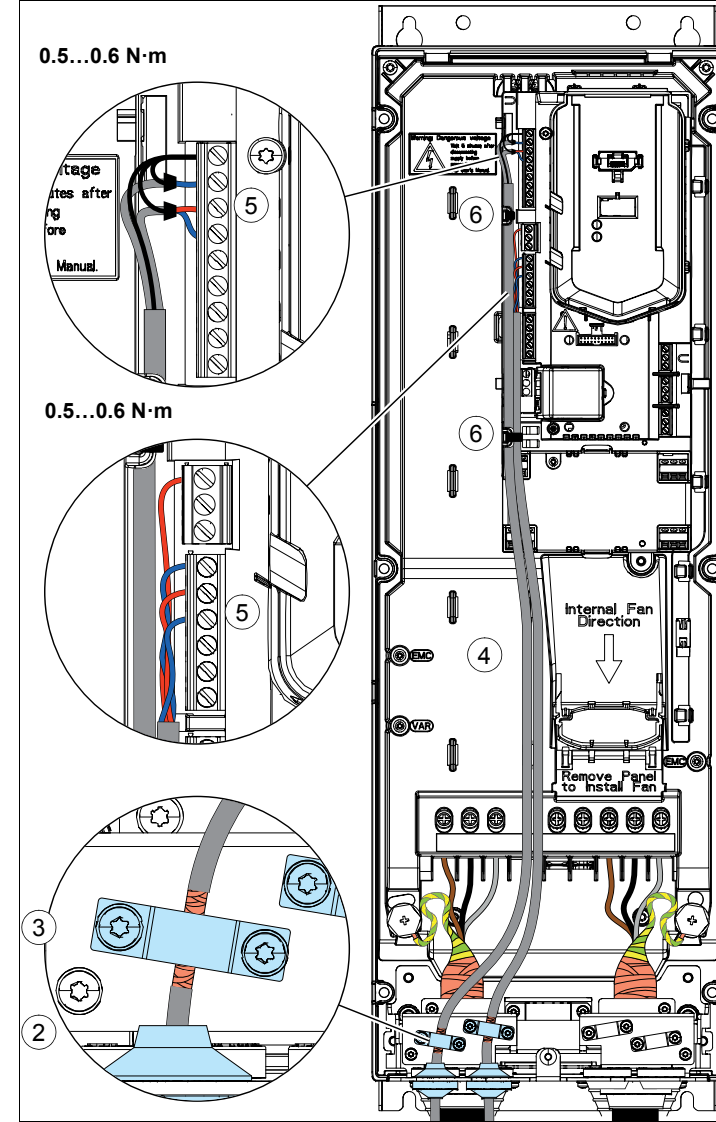
R0...R2

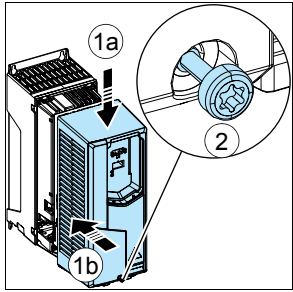
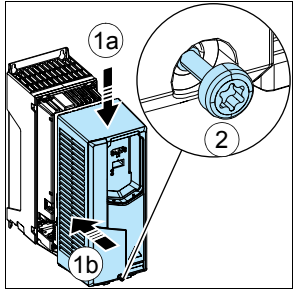
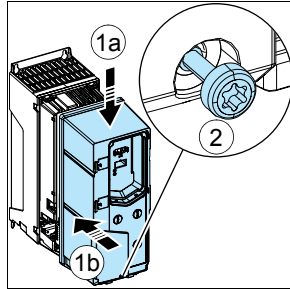
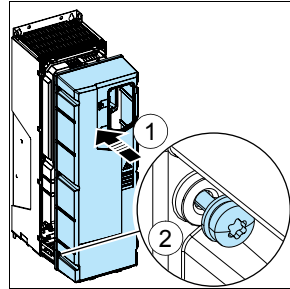


R3

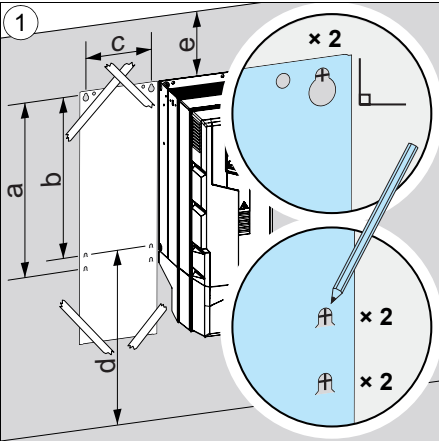


R4



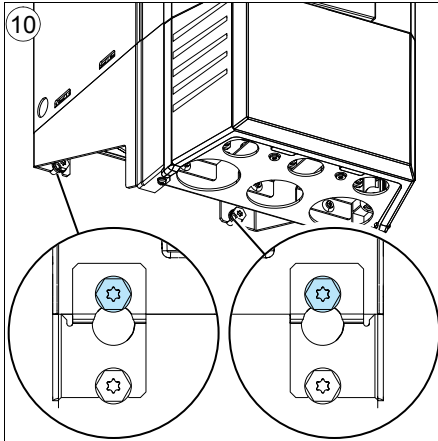
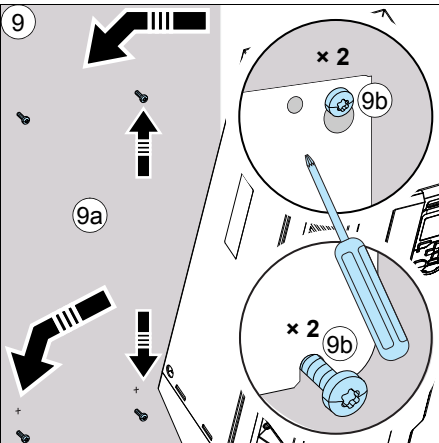
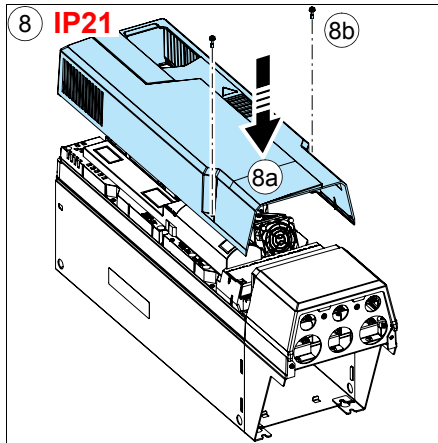
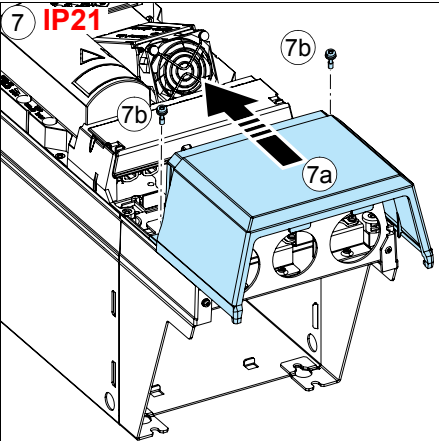
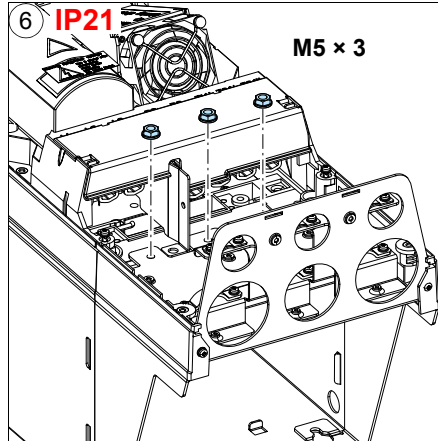
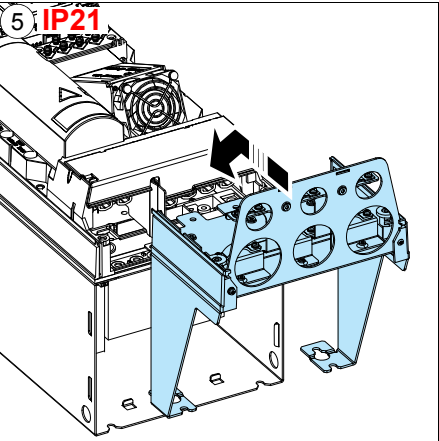
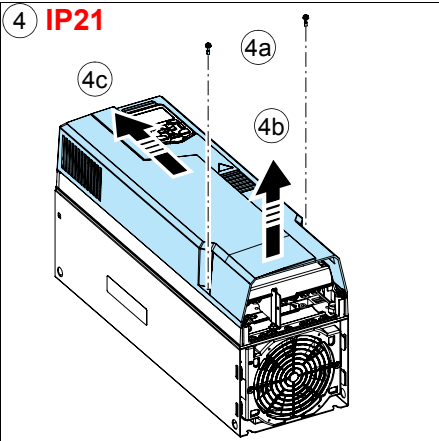
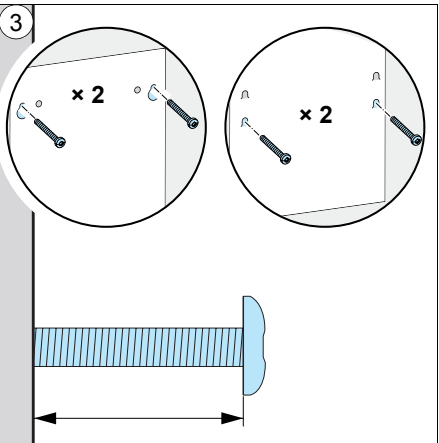
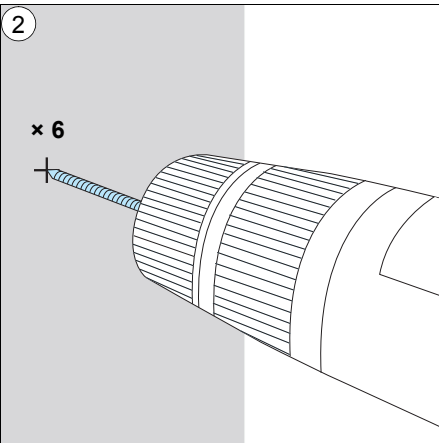
IP21**IP55, R0...R2****IP55, R3****IP55, R4**

R5 Figures A

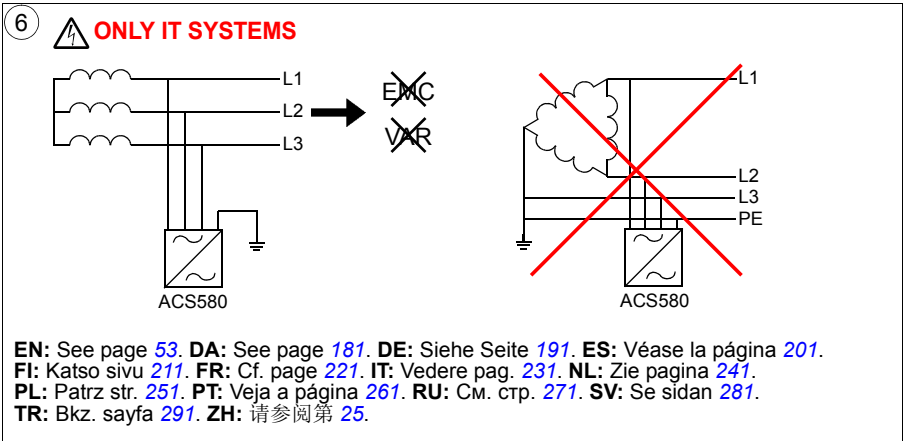
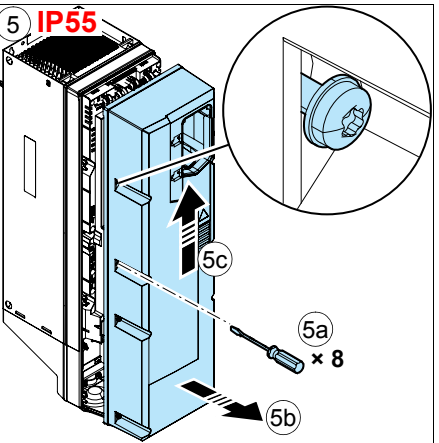
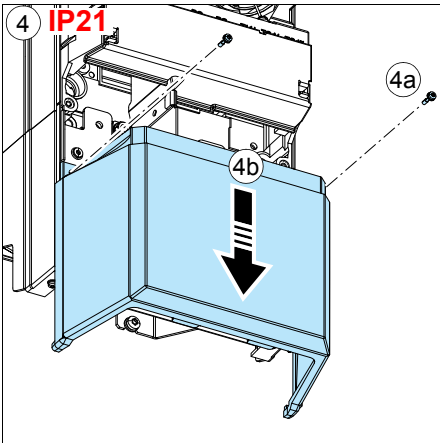
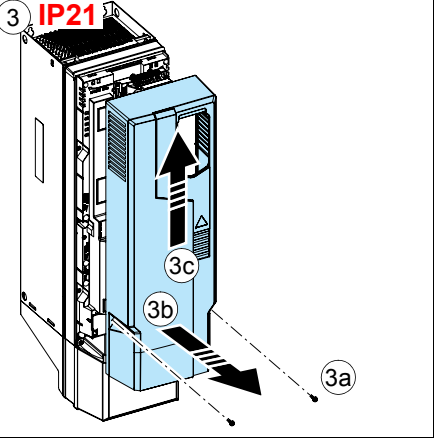
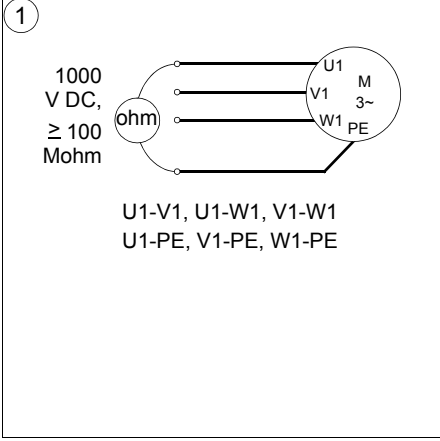


	R5 IP21		R5 IP55	
	mm	in	mm	in
a	612	24.09	612	24.09
b	581	22.87	581	22.87
c	160	6.30	160	6.30
d >	200	7.9	200	7.9
e >	200	7.9	200	7.9

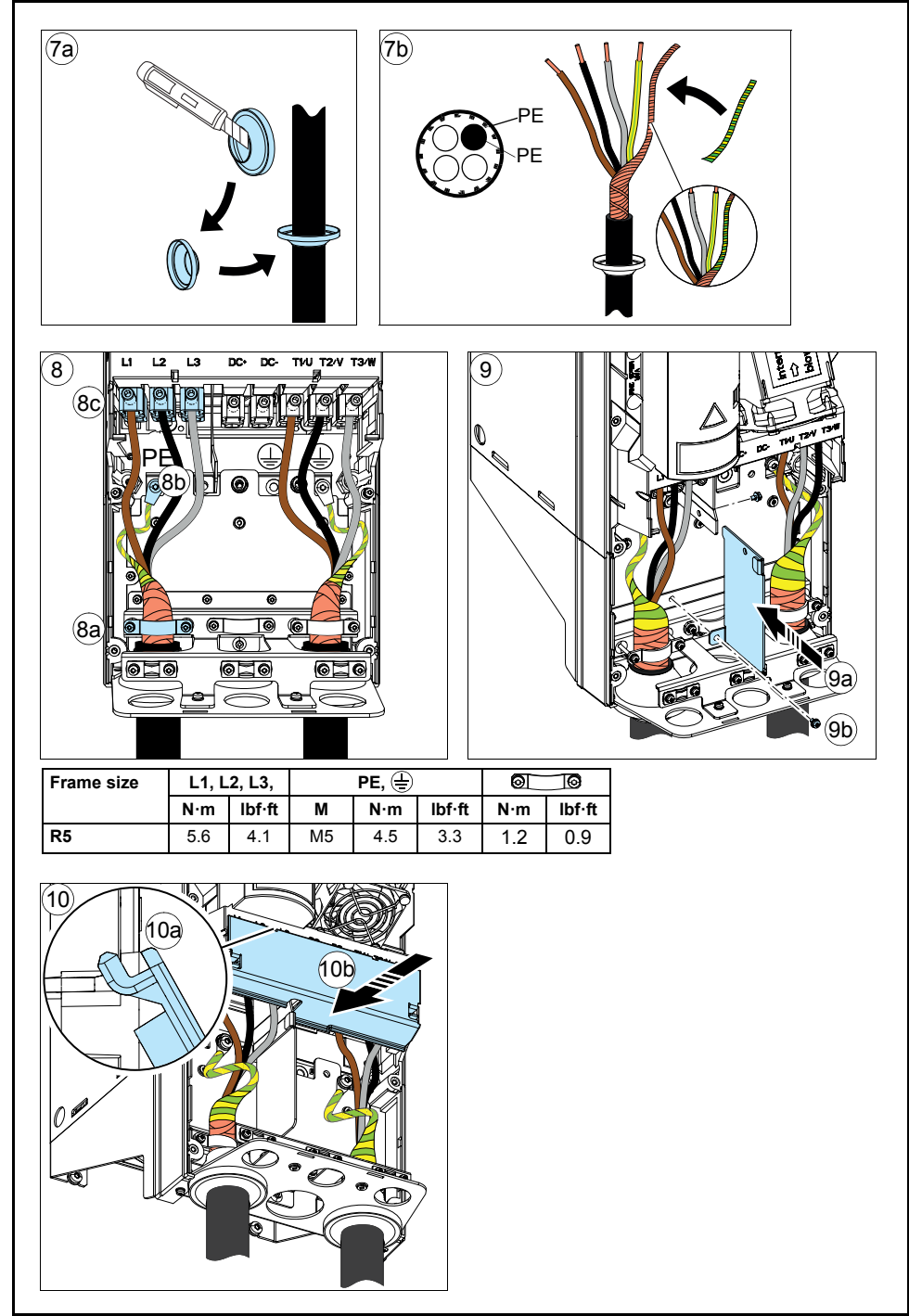
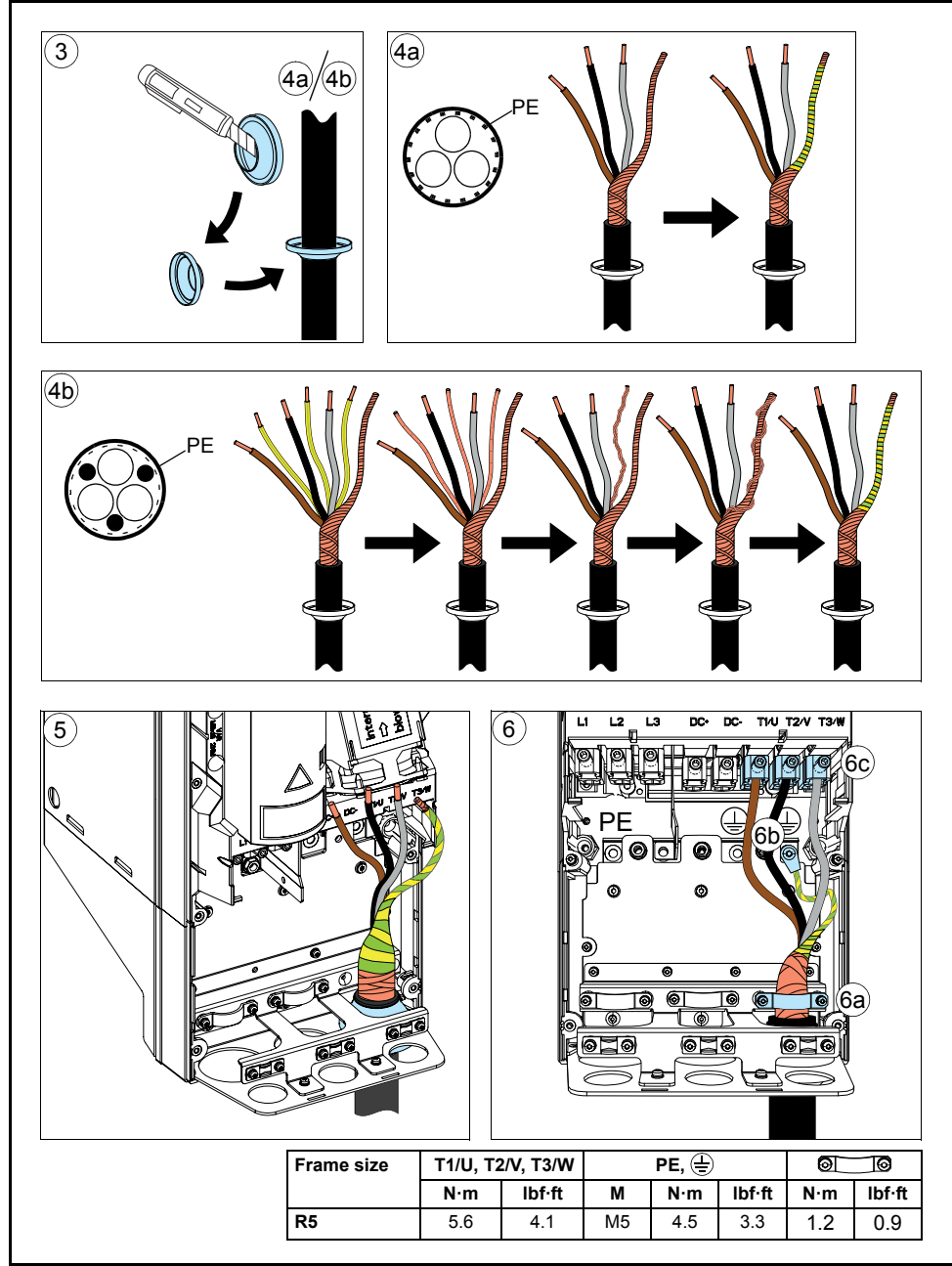
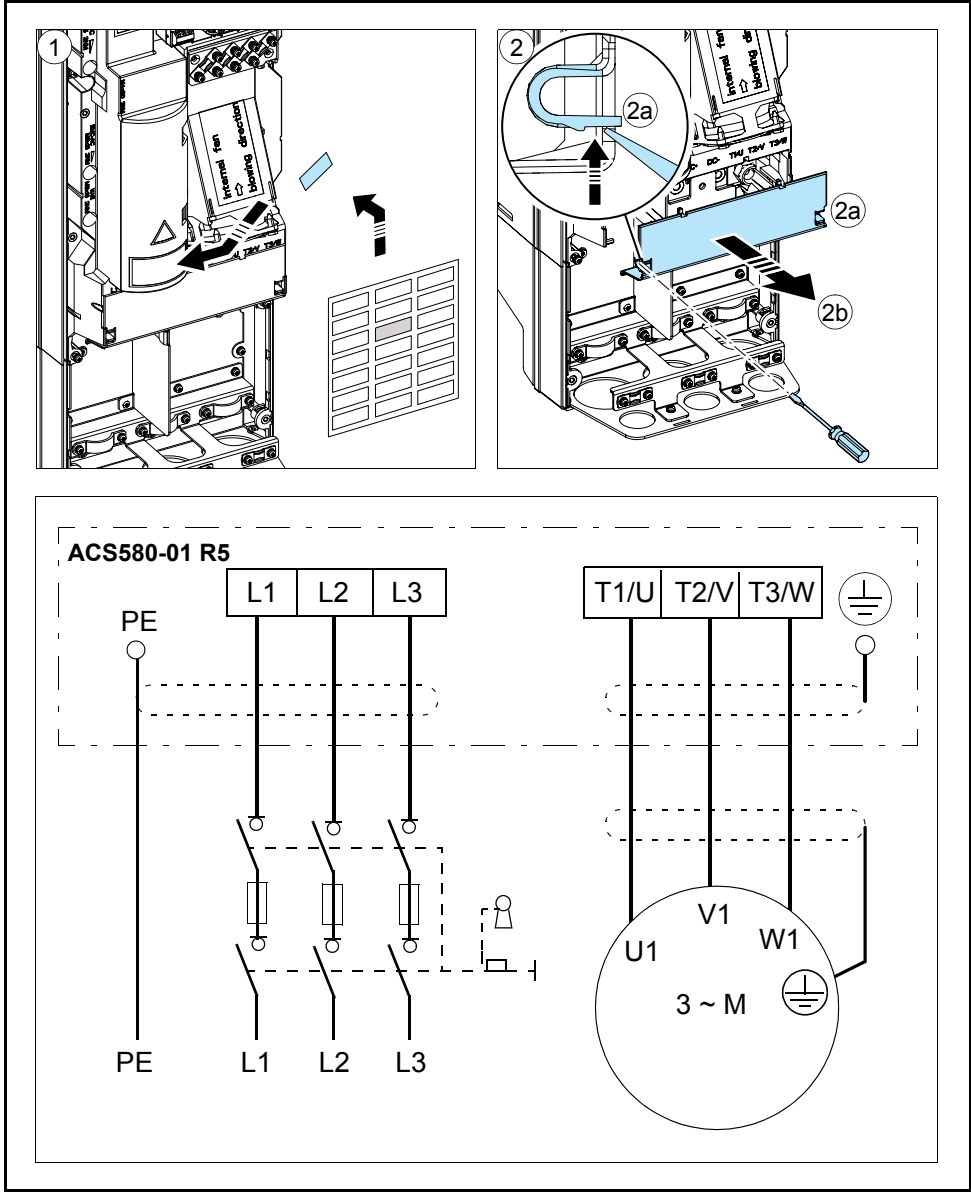
	R5 IP21		R5 IP55	
	kg	lb	kg	lb
!	28.3	62.4	28.6	63.1



B

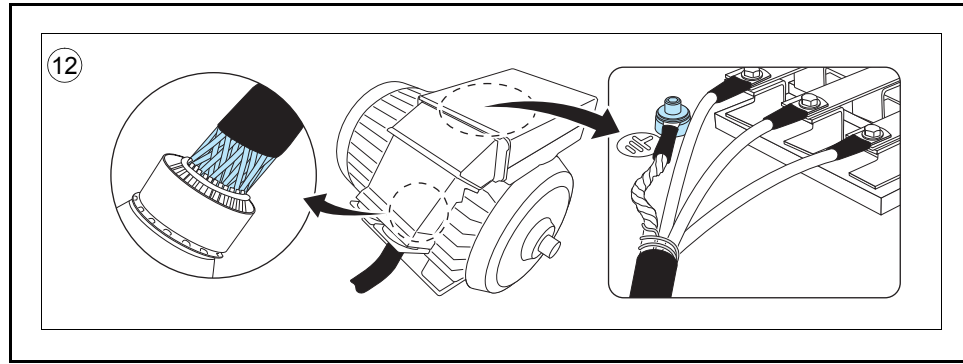


EN: See page 53. DA: See page 181. DE: Siehe Seite 191. ES: Véase la página 201.
FI: Katso sivu 211. FR: Cf. page 221. IT: Vedere pag. 231. NL: Zie pagina 241.
PL: Patrz str. 251. PT: Veja a página 261. RU: См. стр. 271. SV: Se sidan 281.
TR: Bkz. sayfa 291. ZH: 请参阅第 25 页。

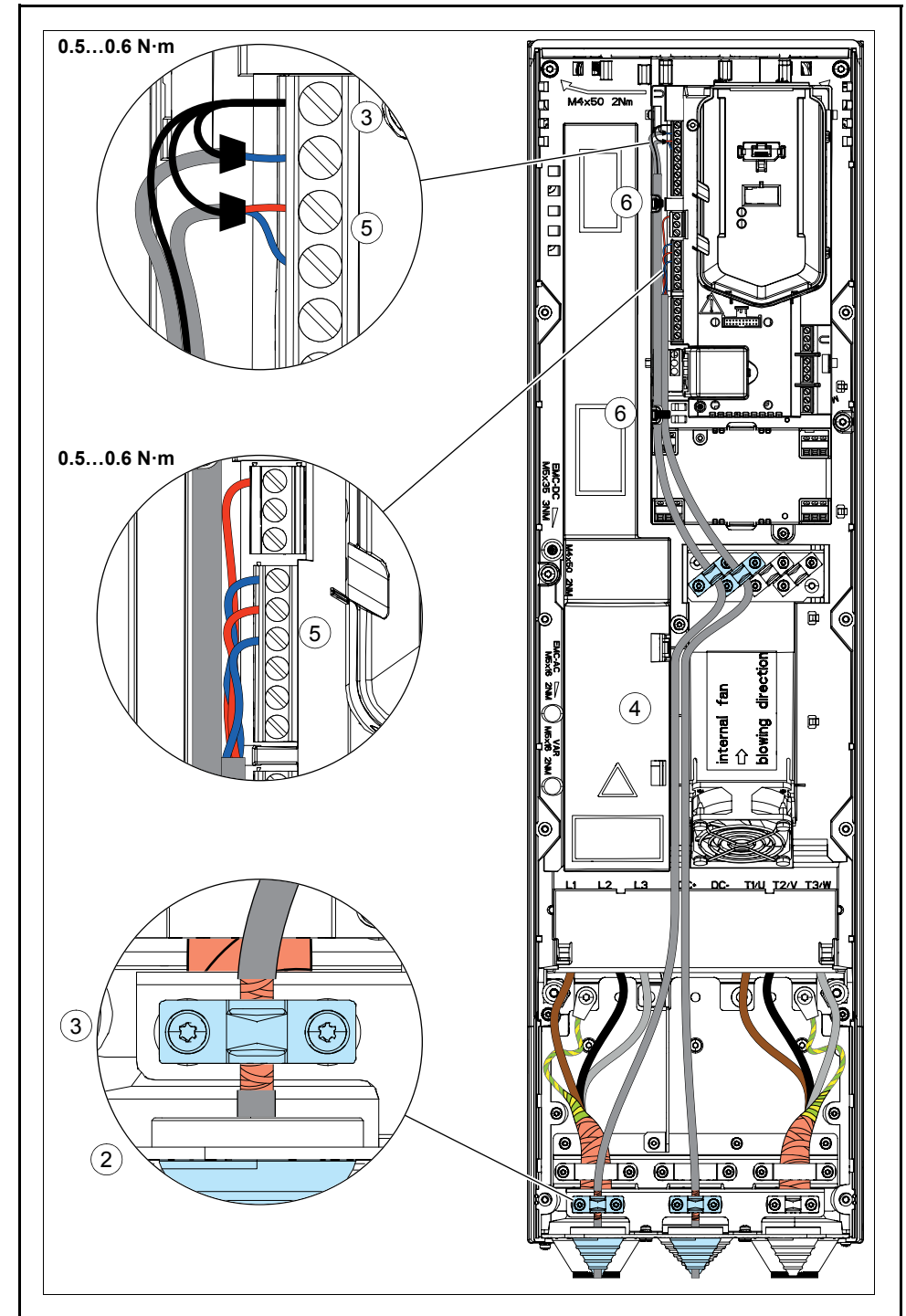


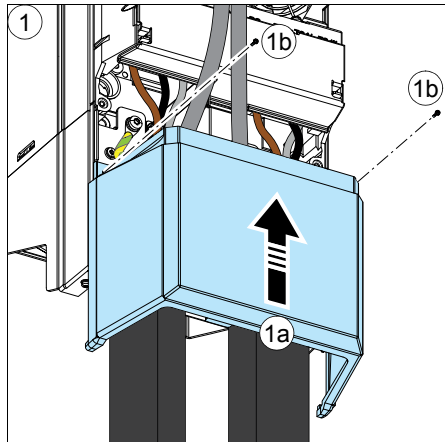
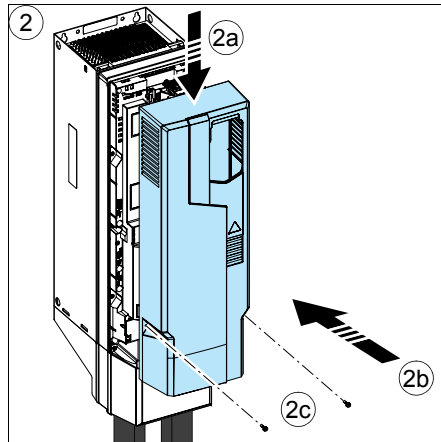
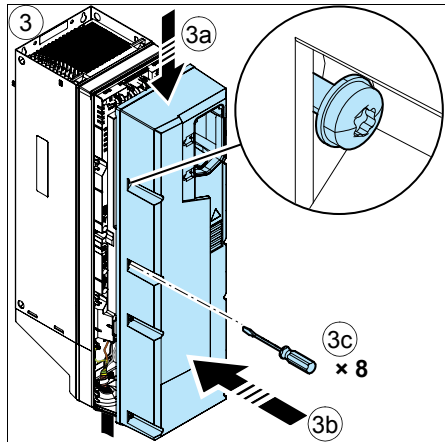


R5 Figures F



G



IP21**IP21****IP55**

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