

ENGINEERING  
TOMORROW

*Danfoss*

# VACON® NXS/NXP Air-cooled

Wall-mounted and Standalone



[drives.danfoss.com](http://drives.danfoss.com)

**VACON®**



<b>1</b>		<b>10</b>
1.1		10
1.2	가	10
1.3		10
1.4		10
1.5		10
<b>2</b>		<b>12</b>
2.1		12
2.2		13
<b>3</b>		<b>15</b>
3.1		15
3.2		15
3.3		15
3.4		16
3.5		18
3.6	가	21
3.7	가 EMC	21
3.8		23
3.8.1		23
3.8.2		23
3.8.3		24
3.8.4		25
<b>4</b>		<b>27</b>
4.1		27
4.1.1	FR4/FI4-FR6/FI6	27
4.1.2	FR7/FI7-FR8/FI8	27
4.1.3	FR10-FR11	28
4.2		28
4.3		28
4.4		29
<b>5</b>		<b>31</b>
5.1		31
5.1.1		31
5.1.2		31

5.2		32
5.2.1		32
5.2.2	FR4 ~ FR9	32
5.2.3	AC (FR10 ~ FR11)	35
5.3		35
5.3.1	AC	35
5.3.2	AC	36
<b>6</b>		<b>37</b>
6.1		37
6.1.1		37
6.1.2	UL	37
6.1.3		38
6.1.4		38
6.1.5		38
6.1.6		38
6.1.7		39
6.2	EMC	39
6.2.1		40
6.3		40
6.4		41
6.4.1	FR4/FI4	41
6.4.2	FR5	42
6.4.3	FR6/FI6	44
6.4.4	FR7/FI7	45
6.4.5	FR8/FI8	47
6.4.6	FR9	49
6.4.7	FR10 Standalone	50
6.4.8	FR11	52
6.5		55
6.5.1	가	56
6.5.2	, FR4-FR6/FI4-FI6	56
6.5.3	, FR7/FI7	59
6.5.4	, FR8/FI8	62
6.5.5	, FR9	65
6.5.6	, FR10	68
6.5.7	, FR11	72
6.6	IT	77



6.6.1	IT	AC	, FR4–FR6	77
6.6.2	IT	AC	, FR7	80
6.6.3	IT	AC	, FR8–FR11	82
<b>7</b>				<b>83</b>
7.1				83
7.2		(+24 V/EXT +24 V)		83
7.3				84
7.3.1				84
7.3.2	OPTA1			84
7.3.2.1				86
7.3.2.2	OPTA1			87
7.3.3	OPTA2	OPTA3		89
7.4				89
7.5				90
<b>8</b>				<b>91</b>
8.1				91
8.2	Monitoring( )		(M1)	91
8.2.1				91
8.3	Parameter( )		(M2)	92
8.3.1				92
8.3.2				93
8.3.3				94
8.4	Keypad Control( )			95
8.4.1	Keypad Control( )			95
8.4.2	Keypad Control( )		M3	95
8.4.3				96
8.4.4	Keypad Reference( )			96
8.4.4.1				97
8.4.5				97
8.4.6				97
8.4.7	Keypad Control( )			97
8.4.7.1				97
8.4.7.2				98
8.5	Active Faults( )		(M4)	98
8.5.1	Active Faults( )			98
8.5.2				99
8.5.3				99

8.6	Fault History( ) (M5)	99
8.6.1	Fault History( ) (M5)	99
8.6.2	Fault History( )	100
8.7	System( ) (M6)	100
8.7.1	System( )	100
8.7.2	System Menu( )	100
8.7.3		104
8.7.4		104
8.7.5	(S6.3)	105
8.7.5.1	(Parameter Sets( ) S6.3.1)	105
8.7.5.2	(Up To Keypad( ), S6.3.2)	105
8.7.5.3	(Down From Keypad( ), S6.3.3)	106
8.7.5.4	Activating or Deactivating the Automatic Parameter Back-up( ) (P6.3.4)	106
8.7.5.5		106
8.7.6		107
8.7.6.1	Security( )	107
8.7.6.2	Password( )	107
8.7.6.3		107
8.7.6.4		108
8.7.6.5		108
8.7.6.6		108
8.7.6.7	Start-up Wizard( ) (P6.5.3)	108
8.7.6.8	/	109
8.7.6.9	/	109
8.7.7		109
8.7.7.1	Keypad Settings( )	109
8.7.7.2		109
8.7.7.3	Operating Menu( ) Default Page( ) (P6.6.2)	110
8.7.7.4		110
8.7.7.5	Contrast adjustment( ) (P6.6.4)	110
8.7.7.6	Backlight Time( ) (P6.6.5)	110
8.7.8		110
8.7.8.1	Hardware Setting( )	110
8.7.8.2		110
8.7.8.3	Fan Control( )	111
8.7.8.4	Fan Control( )	111
8.7.8.5	HMI Acknowledge Timeout(HMI ) (P6.7.3)	111

8.7.8.6	HMI		112
8.7.8.7	HMI	(P6.7.4)	112
8.7.8.8	Sine Filter( )	(P6.7.5)	112
8.7.8.9	Pre-charge Mode( )	(P6.7.6)	112
8.7.9			112
8.7.9.1	System Info( )		112
8.7.9.2	Total Counters( )	(S6.8.1)	112
8.7.9.3	Trip Counters( )	(S6.8.2)	113
8.7.9.4	Trip Counters( )		113
8.7.9.5	Software( )	(S6.8.3)	113
8.7.9.6	Applications( )	(S6.8.4)	113
8.7.9.7	Application( )		114
8.7.9.8	Hardware( )	(S6.8.5)	114
8.7.9.9			114
8.7.9.10	Debug( )	(S6.8.7)	114
8.8	Expander Board( )		115
8.8.1	Expander Board( )		115
8.8.2			115
8.8.3			115
8.9	가		115
<b>9</b>			<b>116</b>
9.1			116
9.2	AC		117
9.3			117
9.3.1			117
9.3.2			117
9.3.3			118
9.4			118
9.4.1	AC		118
9.4.2	가		118
9.4.2.1	A:		119
9.4.2.2	B:		119
9.4.3			119
9.4.4	ID		119
<b>10</b>			<b>120</b>
10.1			120
10.2			120

<b>11</b>		<b>122</b>
11.1		122
11.2		122
11.3		122
<b>12</b>		<b>124</b>
12.1	AC	124
12.2		124
12.2.1		124
12.2.2		125
12.2.2.1	FR4–FR6	125
12.2.2.2	FR7	127
12.2.2.3	FR8	128
12.2.2.4	FR9	130
12.2.3		132
12.2.3.1	, FR4–FR6	132
12.2.3.2	, FR7–FR8	134
12.2.3.3	, FR9	136
12.2.4		137
12.2.4.1	FR10–FR11	137
12.3		140
12.3.1		140
12.3.2	208–240 V 380–500 V, FR4 ~ FR9	140
12.3.3	208–240 V 380–500 V, FR4 ~ FR9,	141
12.3.4	525–690 V, FR6 ~ FR9	142
12.3.5	525–690 V (UL 600 V), FR6 ~ FR9,	143
12.3.6	380–500 V, FR10 ~ FR11	144
12.3.7	380–500 V, FR10 ~ FR11,	144
12.3.8	525–690 V, FR10 ~ FR11	145
12.3.9	525–690 V (UL 600 V), FR10 ~ FR11,	146
12.4		146
12.5		147
12.6		148
12.7		148
12.7.1		148
12.7.2	208–240 V	149
12.7.3	208–240 V ,	150
12.7.4	380–500 V	151



---

12.7.5	380–500 V	,	153
12.7.6	525–690 V (UL	600 V)	154
12.7.7	525–690 V (UL	600 V),	155
12.8	VACON® NXP		156
12.9			160
12.9.1			160
12.9.2	208–240 V		161
12.9.3	380–500 V		161
12.9.4	525–690 V		163
12.9.5		, FR4–FR6 (380–500 V)	164
12.10			164

---

1

1.1

가

1.2 가

AC

- VACON® NX
- VACON® NX I/O I/O

! <https://www.danfoss.com/en/service-and-support/>

가

REMARQUE Vous pouvez télécharger les versions anglaise et française des manuels produit contenant l'ensemble des informations de sécurité, avertissements et mises en garde applicables sur le site <https://www.danfoss.com/en/service-and-support/>.

1.3

가



1.4

Danfoss

가


Danfoss

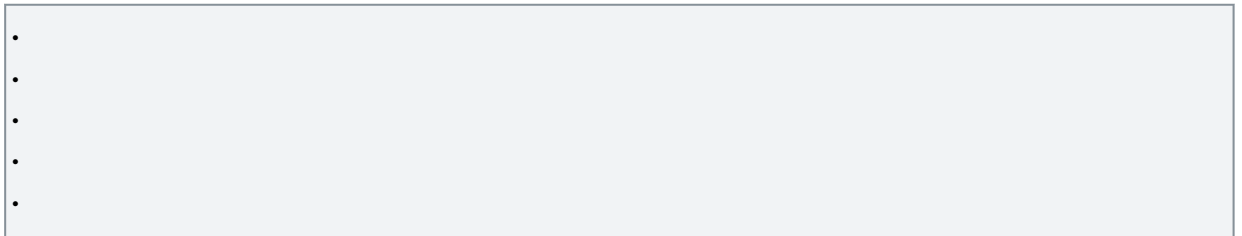
1.5

가

Vacon Ltd

AC

1. (4.1 )).
2. 2.1 2.2
3. AC (5.2.2 FR4 ~ FR9 5.2.3 AC  
(FR10 ~ FR11) 12.8 VACON® NXP
4. 6.1 , 6.2 EMC  
6.3
5. (6.5 )).
6. 7.3.2 OPTA1
7. 가 , a b .[enter]( )  
가 , a b  
a. M6, 6.1 8.7.3  
b. M6, 6.2 8.7.4
8. .AC 가 G2.1  
가 가 VACON®



9. (9.2 AC )).

VACON® NXS/NXP AC

가

## 2

### 2.1

⚠ ⚠

가 .  
- 가 가 .

⚠ ⚠

U, V, W, 가 가  
- 가 U, V, W, .  
가

⚠ ⚠

DC 가 가 5  
- :  
가  
( / ) 가  
AC 5 .

⚠ ⚠

가 .  
- .

⚠ ⚠

가, 가 Start/Stop( / )  
- 가 , , I/O ( )  
가  
가



⚠ ⚠	
-	가 3.5 mA 가

⚠ ⚠	
PE	PE RCD가 (RCD) B (RCM)
-	B RCD RCM

2.2

⚠ ⚠	
-	AC AC 가

⚠ ⚠	
-	AC 가

⚠ ⚠	
-	AC 가 PE

⚠ ⚠	
AC	가
-	,

⚠ ⚠	
'	' 가
-	' 가

⚠ ⚠	
AC	AC ESD
-	AC ESD ESD

	AC		가		
-	AC				

	EMC		AC		
AC		EMC			EMC
-	AC		AC	EMC	

-					

AC	가				(EN 60204-1)
).					

AC		가		가	
----	--	---	--	---	--

		가			
-	AC				

### 3

#### 3.1

• AC  
 •  
 VACON® NXP (PLC) I/O VACON® IEC 61131/3 PLC 가

가

가

[. 12.8 VACON® NXP](#)

#### 3.2

1:

DPD016511	FR10 FR11 가.

#### 3.3



(A)
(B)

**AC DRIVE**    B.ID : 171208    1003322235


Type: NXP00875-A2H1SSS-A1A2000000

---


(D) S/ N: V00001687465

Code: 7DP-008752-116SC8



135X9219




---

(E) INPUT: U<sub>in</sub>:3~AC,380-500V, 50/60Hz,  
87A 40°C / 72A 50°C

(F) OUTPUT: 3~AC,0-U<sub>in</sub>, 0-320Hz,  
87A 40°C / 72A 50°C




(G) POWER : 45kW:400V / 60HP:480V  
IP21/Type1

(H) Firm ware : NXP00002V195

(I) Appl icat ion :

Cust. Ord. No: 0018131571

Marks:

Danfoss Limited

VACON®

Made in Finland  
Danfoss A/S, 6430 Nordborg, Denmark

e30bf961.10

**1: VACON® NXS/NXP AC**

<p>A            ID</p> <p>B            VACON            ®</p> <p>C</p> <p>D</p> <p>E</p>	<p>F</p> <p>G</p> <p>H</p> <p>I</p>
--	-------------------------------------

**3.4**  
VACON®

- NXP00035-A2H1SSS-A1A2C30000+DN0T

2:

VACON	
NXP	:
	<ul style="list-style-type: none"> <li>• NXP = VACON® NXP</li> <li>• NXS = VACON® NXS</li> </ul>
0003	: 0003 = 3 A



5	<p style="text-align: center;">:</p> <ul style="list-style-type: none"> <li>• 2 = 208–240 V</li> <li>• 5 = 380–500 V</li> <li>• 6 = 525–600 V (IEC) 525–600 V (cULus)</li> </ul>
A	<p style="text-align: center;">:</p> <ul style="list-style-type: none"> <li>• A = ( )</li> <li>• B =</li> <li>• F =</li> <li>• G =</li> </ul>
2	<p style="text-align: center;">:</p> <ul style="list-style-type: none"> <li>• 0 = IP00</li> <li>• 2 = IP21 (UL 1)</li> <li>• 5 = IP54 (UL 12)</li> <li>• T = ( )</li> </ul>
H	<p>EMC :</p> <ul style="list-style-type: none"> <li>• C = IEC/EN 61800-3 + A1 C1,1 1000 V</li> <li>• H = IEC/EN 61800-3 + A1 C2, 1000 V</li> <li>• L = IEC/EN 61800-3 + A1 C3,2 1000 V</li> <li>• T = IT (C4) IEC/EN 61800-3 + A1 .</li> <li>• N = EMC . EMC 가 .</li> </ul>
1	<p style="text-align: center;">:(<sup>1</sup>)</p> <ul style="list-style-type: none"> <li>• 0 =</li> <li>• 1 =</li> <li>• 2 = , 가 :</li> <li>- 208–240 V (FR4–FR6)</li> <li>- 380–500 V (FR4–FR6)</li> </ul>
SSS	<p style="text-align: center;">:</p> <ul style="list-style-type: none"> <li>• , (Xxx):</li> <li>- S = 6 (FR4 ~ FR11)</li> <li>- B = 가 (FR8 ~ FR11)</li> <li>- O = ( )</li> <li>- J = DC 가 FR10 ~ 11</li> <li>- P = UL ( )</li> <li>- K = DC UL ( )</li> <li>• , : (xXx):</li> <li>- S =</li> <li>• , (xxX):</li> </ul>

	<ul style="list-style-type: none"> <li>- S = (FR4 ~ FR8)</li> <li>- V = (FR4 ~ FR8)</li> <li>- F = (FR9 ~ FR11)</li> <li>- G = (FR9 ~ FR11)</li> <li>- A = , (FR10 ~ FR11 )</li> <li>- B = , , (FR10 ~ FR11 )</li> <li>- N = IP54 (UL 12) , , (FR9 IP00, ≥ FR10)</li> <li>- O = IP54 (UL 12) , , (FR9 IP00, ≥ FR10)</li> <li>- X = IP00 , (FR9 IP00)</li> <li>- Y = IP00 , (FR9 IP00)</li> </ul>
A1A2C30000	<p>: 2 .00 =</p> <p>:</p> <ul style="list-style-type: none"> <li>• A = I/O</li> <li>• B = I/O</li> <li>• C =</li> <li>• D =</li> <li>• E =</li> </ul> <p>, C3 = PROFIBUS DP</p>
+DNOT	. VACON® NXP .

1 208–240 V (FR7–FR11), 380–500 V (FR7–FR11) 525–690 V ( )

### 3.5

AC (3.3 ) (3.4 )

"NXP00035-A2H1SSS-A1A2C30000+DNOT" 0003 5

3:

2 (208–240 V)	0003	FR4
	0004	
	0007	
	0008	
	0011	
	0012	
	0017	FR5
	0025	

	0031	
	0048	FR6
	0061	
	0075	FR7
	0088	
	0114	
	0140	FR8
	0170	
	0205	
	0261	FR9
	0300	
5 (380–500 V)	0003	FR4
	0004	
	0005	
	0007	
	0009	
	0012	
	0016	FR5
	0022	
	0031	
	0038	FR6
	0045	
	0061	
	0072	FR7
	0087	
	0105	

	0140	FR8
	0168	
	0205	
	0261	FR9
	0300	
	0385	FR10
	0460	
	0520	
	0590	FR11
	0650	
	0730	
	6 (500–690 V)	0004
0005		
0007		
0010		
0013		
0018		
0022		
0027		
0034		
0041		FR7
0052		
0062		FR8
0080		
0100		
0125		FR9



	0144	
	0177	
	0205	
	0261	FR10
	0325	
	0385	
	0416	
	0460	FR11
	0502	
	0590	

### 3.6 가

4: 가

		IP21 (UL 1)	IP54 (UL 12)
208-240 V	FR4-FR9	x	x
350-500 V	FR4-FR9	x	x
350-500 V	FR10	x	x
350-500 V	FR11	x	-
525-690 V	FR4-FR9	x	x
525-690 V	FR10	x	x
525-690 V	FR11	x	-

### 3.7 가 EMC

5 (EMC ) IEC/EN 61800-3 + A1 5 가 . VACON® AC  
 5 EMC . VACON® NX AC IEC/EN 61800-3 + A1  
 AC (3.4 ).  
 AC .

- 
- 
- ( IEC/EN 61800-3 + A1 )

5: 가 EMC

IEC/EN 61800-3 + A1 EMC	VA-CON® EMC		가
C1	C	EMC 1 AC 1000 V AC IP21 (UL 1) C1	380–500 V, FR4 ~ FR6, IP54 (UL 12)
C2	H	V AC 가 AC 1000 C2 AC 1 2	380–500 V, FR4 ~ FR9, 208–240 V, FR4 ~ FR9
C3	L	1000 V AC 가 AC 2	380–500 V, FR10, 525–690 V, FR6, IP21 (UL 1), IP54 (UL 12)
C4	T	AC IT, IEC/EN 61800-3 + A1 .IT AC 가 , EMC VACON® NX AC EMC C2 C3 ~ C4 <a href="#">6.6 IT</a>	
EMC	N	AC EMC EMC EMC -	IP00

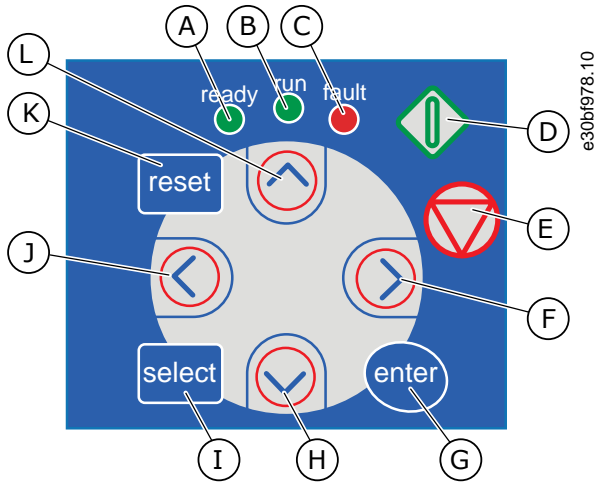
3.8

3.8.1

AC . . . . . AC . . . . . AC  
 AC . . . . .

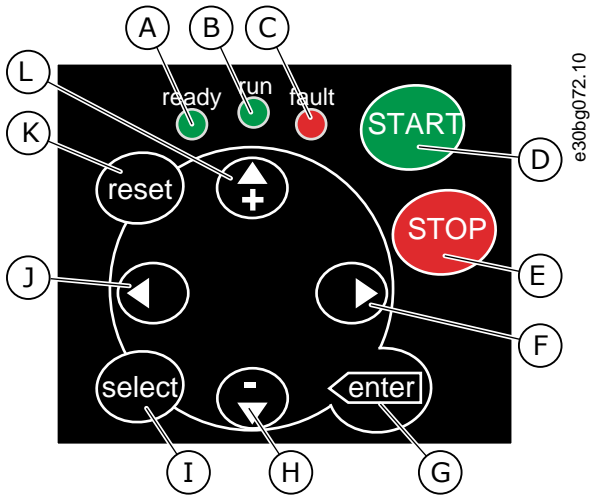
3.8.2

VACON® AC ( ) 9



2: VACON® NXP

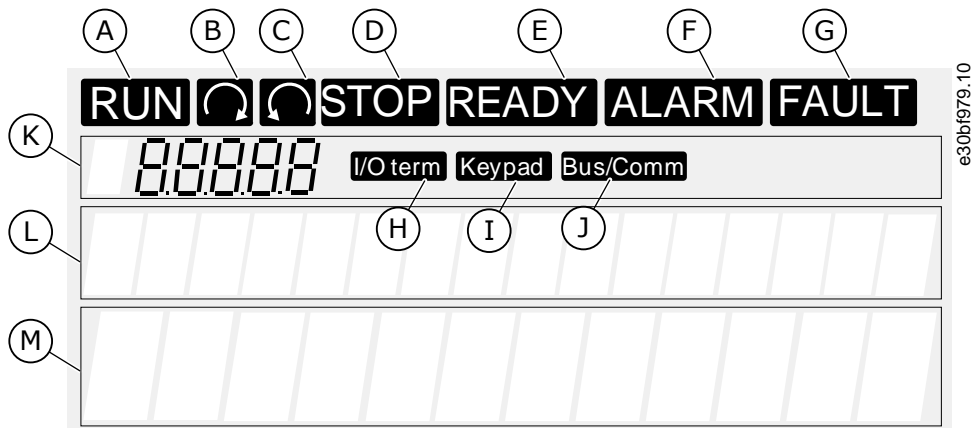
<p>A [ready]( ) LED가 READY( )가</p>	<p>G [enter]( ) (2-3 )</p>
<p>B 가 [run](가 ) LED가 Stop( ) LED가 가</p>	<p>H Browser( )</p>
<p>C (Fault Trip( )) AC 가 [fault]( ) LED가 . 8.5.1 Active Faults( )</p>	<p>I [select]( ) 2</p>
<p>D Start( ) 가 . 8.4.3</p>	<p>J Menu( ) ( )</p>
<p>E Stop( ) ( R3.4/R3.6 가 ). 8.4.2 Keypad Control( ) M3</p>	<p>K [reset]( )</p>
<p>F Menu( ) ( )</p>	<p>L Browser( )</p>



3: VACON® NXS

<p>A [ready]( ) LED가 READY( )가</p> <p>B 가 [run](가 ) LED가 Stop( ) LED가</p> <p>C (Fault Trip( )) AC 가 [fault]( ) LED가  <a href="#">. 8.5.1 Active Faults( )</a></p> <p>D [START]( ) 가  <a href="#">. 8.4.3</a></p> <p>E [STOP]( ) ( R3.4/R3.6 가  <a href="#">. 8.4.2 Keypad Control( )</a>  <a href="#">M3</a></p> <p>F Menu( ) ( )</p>	<p>G [enter]( ) (2-3 )</p> <p>H Browser( )</p> <p>I [select]( )</p> <p>J Menu( ) ( )</p> <p>K [reset]( )</p> <p>L Browser( )</p>
---	--

3.8.3



4:

A	가 RUN(가 ) 가	.	가	H	I/O 가	.
B	.	.		I	.	.
C	.	.		J	가	.
D	가	.		K	가 . , M2 = 2( ) P2.1.3 = 가	.
E	가	.		L	.	,
F	.	.		M	.	,
G	AC 가	.			가	.

(A-G) AC  
(H, I, J)

START/STOP( / )  
Keypad control( ) (M3)

(8.4.3)

3 (K, L, M)

3.8.4  
AC

AC

메인 메뉴

하위 메뉴

메인 메뉴

하위 메뉴

e30b1981.10

**M1 Monitor**

- V1.1 Output frequency
- V1.2 Frequency ref.
- V1.3 Motor speed
- V1.4 Motor current
- V1.5 Motor torque
- V1.6 Motor power
- V1.7 Motor voltage
- V1.8 DC-link voltage
- V1.9 Unit temperature
- V1.10 Motor temp.
- V1.11 Analogue Input 1
- V1.12 Analogue Input 2
- V1.13 Current input
- V1.14 DIN1, DIN2, DIN3
- V1.15 DIN4, DIN5, DIN6
- V1.16 Analogue output
- V1.17 Multimonit. items

**M2 Parameters**

어플리케이션 매뉴얼 참조

**M3 Keypad control**

- P3.1 Control place
- R3.2 Keypad reference
- P3.3 Direction (on keypad)
- P3.4 Stop button

**M4 Active faults**

**M5 Fault history**

**M6 System menu**

- S6.1 Language selection
- S6.2 Application selection
- S6.3 Copy parameters
- S6.4 Compare param.
- S6.5 Security
- S6.6 Keypad settings
- S6.7 Hardware settings
- S6.8 System information
- S6.9 Power monitor
- S6.11 Power multi-monitor

**M7 Expand-er boards**

5: AC

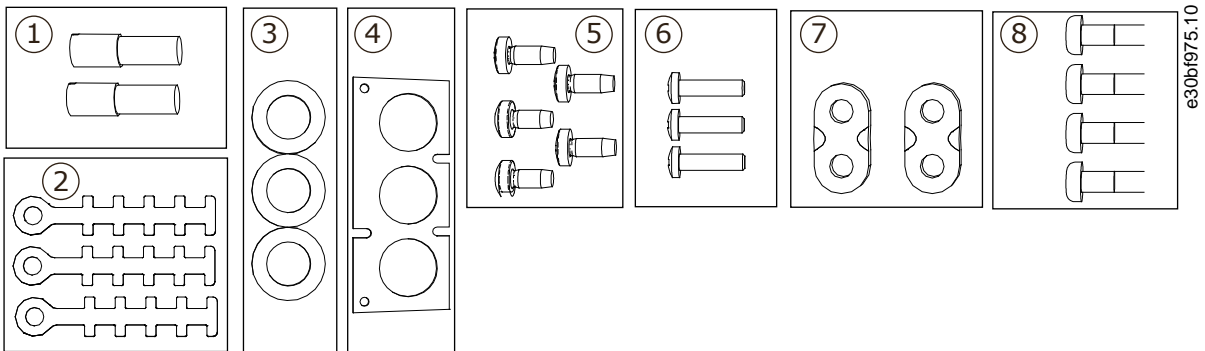
## 4

### 4.1

VACON® AC 가

1. 가
2. (3.3 \_\_\_\_\_ ).
3. (3.4 \_\_\_\_\_ )).
4.
  - - FR4/FI4–FR4-FR6: [4.1.1 FR4/FI4–FR6/FI6](#)
  - - FR7/FI7–FR8/FI8: [4.1.2 FR7/FI7–FR8/FI8](#)
  - - FR10–FR11 : [4.1.3 FR10–FR11](#)

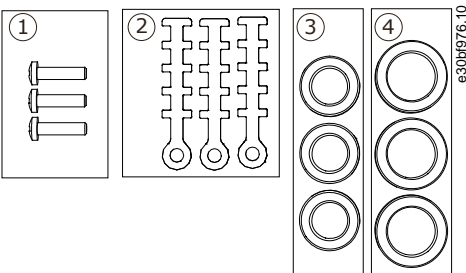
#### 4.1.1 FR4/FI4–FR6/FI6



6: FR4–FR6/FI4–FI6

1	(FR4/FI4, FR5), 2	5	, M4x10, 5
2	, 3	6	, M4x16, 3
3	( _____ ), 3	7	(FR6/FI6), 2
4		8	M5x16 (FR6/FI6), 4

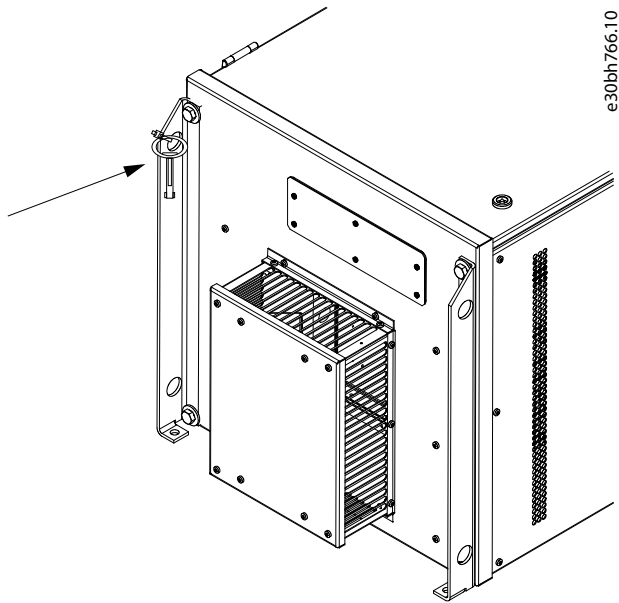
#### 4.1.2 FR7/FI7–FR8/FI8



7: FR7–FR8/FI7–FI8

1	, M4x16, 3	3	GD21 (FR7/FI7 IP54/UL 12), 3 / (FR8/FI8), 6
2	, 3	4	GDM36 (FR7/FI7), 3

4.1.3 FR10–FR11  
AC



8:

4.2

1. AC

<ul style="list-style-type: none"> <li>• : -40...+70° C (-40...+158° F)</li> <li>• : 0–95%,</li> </ul>
--

2. AC 2, 1 AC 가

3. 12, DC [10.2](#)

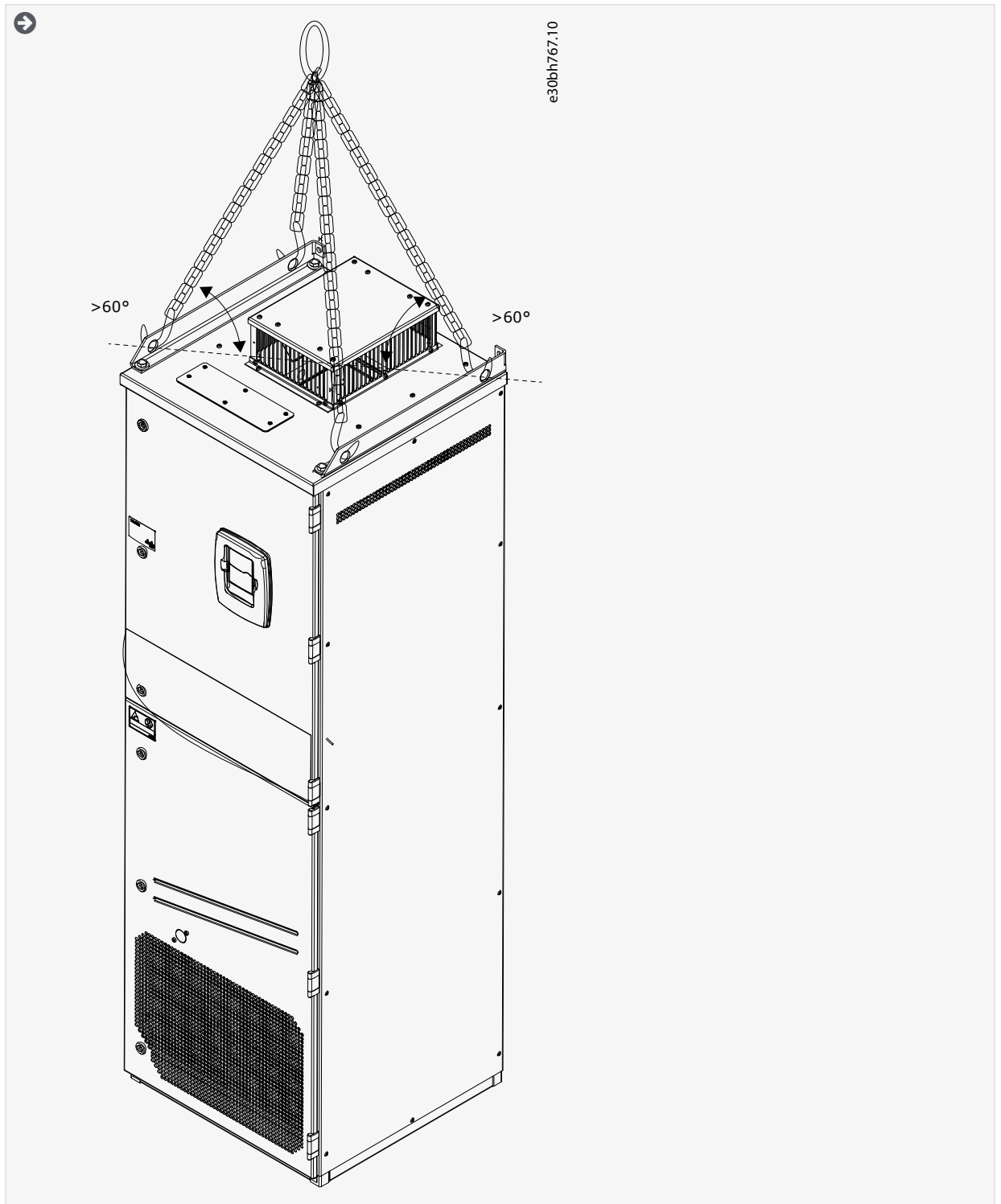


4.3

AC

1. AC ([12.1 AC](#)).
2. FR7/FI7 AC





3.

4.4

" "

AC

Drive modified:	
<input type="checkbox"/> Option board: NXOPT.....	Date:.....
in slot: A B C D E	Date:.....
<input type="checkbox"/> IP54 upgrade/Collar	Date:.....
<input type="checkbox"/> EMC level modified: H/L to T	Date:.....

e30bf977.10

9:

1. AC
2. AC

## 5

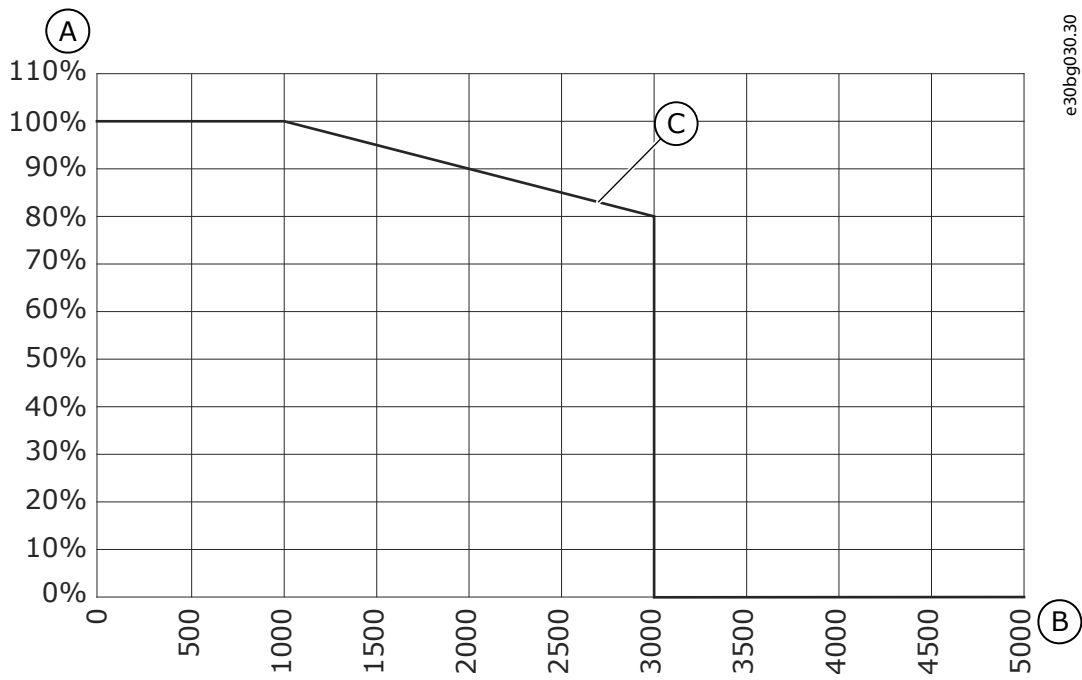
### 5.1

#### 5.1.1

가 가  
 AC  
 AC  
 AC  
[12.8 VACON® NXP](#)  
 :  
 • AC ([5.2.2 FR4 ~ FR9](#) [5.2.3 AC \(FR10 ~ FR11\)](#) ).  
 •  
 •

#### 5.1.2

가 ( / ) 가 ( , 가  
 VACON® NX AC 1000 m  
 3000 m ( )  
 가 가가  
[12.8 VACON® NXP](#)  
 1000 m 100 m 1%  
 , I/O VACON® NX I/O  
 , 2500 m 85% (100% - (2500-1000 m) / 100 m x 1% = 85%).  
 가  
 2000 :  
 $I = I_n * (1 - (h - 2000) / 100 * 0.5 / 100)$   
 I =  
 $I_n =$   
 $h =$



e30bg030.30

10:

A	, %	C
B	,	

## 5.2

### 5.2.1

AC

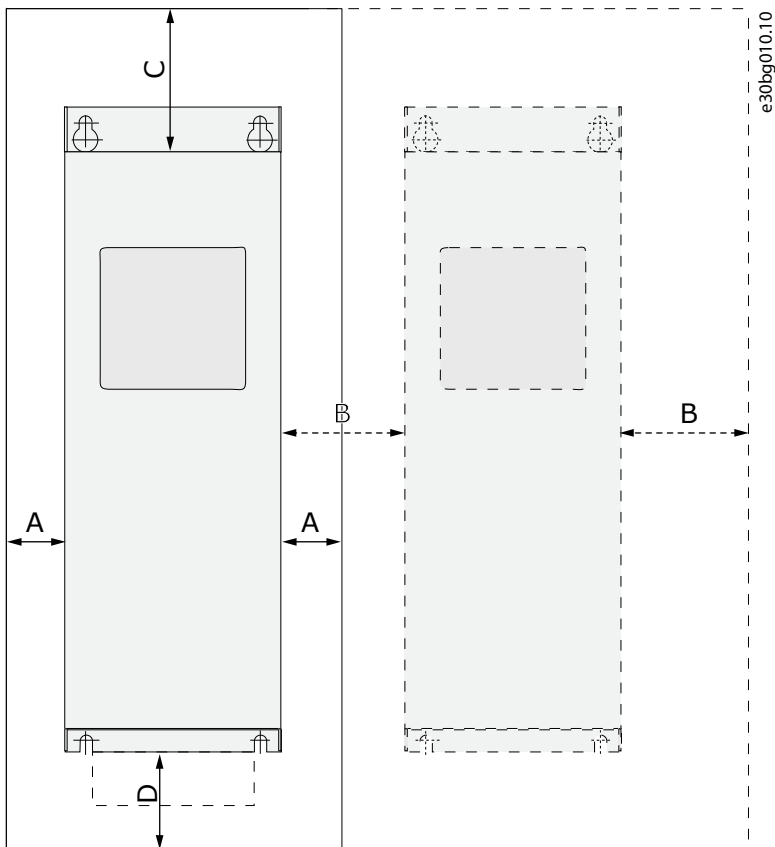
가

### 5.2.2 FR4 ~ FR9

AC

가

C+D ( 11 ).



11:

A	(B C )	C
B		D

6: mm(inch) AC

	A	B	C	D
0003 2-0012 2 0003 5-0012 5	20 (0.79)	20 (0.79)	100 (3.94)	50 (1.97)
0017 2-0031 2 0016 5-0031 5	20 (0.79)	20 (0.79)	120 (4.72)	60 (2.36)
0048 2-0061 2 0038 5-0061 5 0004 6-0034 6	30 (1.18)	20 (0.79)	160 (6.30)	80 (3.15)
0075 2-0114 2 0072 5-0105 5 0041 6-0052 6	80 (3.15)	80 (3.15)	300 (11.81)	100 (3.94)
0140 2-0205 2 0140 5-0205 5 0062 6-0100 6	80 (3.15) <sup>(1)</sup>	80 (3.15)	300 (11.81)	300 (11.81)

	A	B	C	D
0261 2-0300 2 0261 5-0300 5 0125 6-0208 6	50 (1.97)	80 (3.15)	400 (15.75)	250 / 350 (9.84) / (13.78) <sup>(2)</sup>

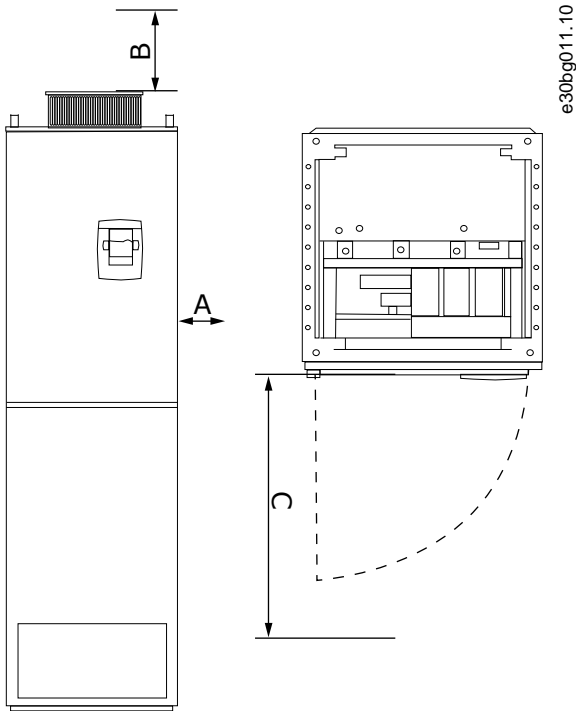
1 150 mm(5.91 inch)

2

7:

	[m <sup>3</sup> /h]	[CFM]
0003 2-0012 2 0003 5-0012 5	70	41.2
0017 2-0031 2 0016 5-0031 5	190	112
0048 2-0061 2 0038 5-0061 5 0004 6-0034 6	425	250
0075 2-0114 2 0072 5-0105 5 0041 6-0052 6	425	250
0140 2-0205 2 0140 5-0205 5 0062 6-0100 6	650	383
0261 2-0300 2 0261 5-0300 5 0125 6-0208 6	1000	589

5.2.3 AC (FR10 ~ FR11)



12: AC

A B	C
--------	---

8: mm(inch) AC

	A	B	C
0385 5-0730 5 0261 6-0590 6	20 (0.79)	200 (7.87)	800 (31.50)

9:

	[m <sup>3</sup> /h]	[CFM]
0385 5-0520 5 0261 6-0416 6	2000	900
0590 5-0730 5 0460 6-0590 6	3000	1765

<http://ecosmart.danfoss.com/>

5.3

5.3.1

AC

VACON® NX

AC

VACON® NX

FI4-FI8

1.

- - 가 , 가 .

- -

- - AC ( ) IP54(UL 12) IP21(UL 1)

2. AC (12.2.1 ) .

3. AC (5.2.2 FR4 ~ FR9 ) .

4. AC .

### 5.3.2 AC

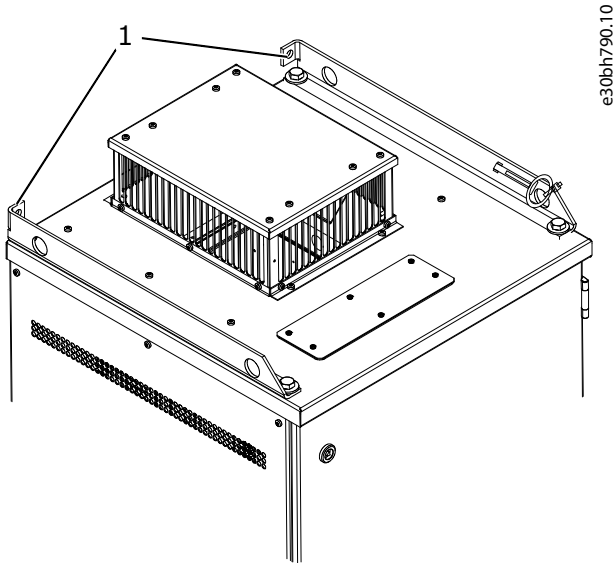
AC .

1. .

2. AC (12.2.4.1 FR10~FR11 ) .

3. AC (5.2.3 AC (FR10 ~ FR11) ) .

4. , AC .

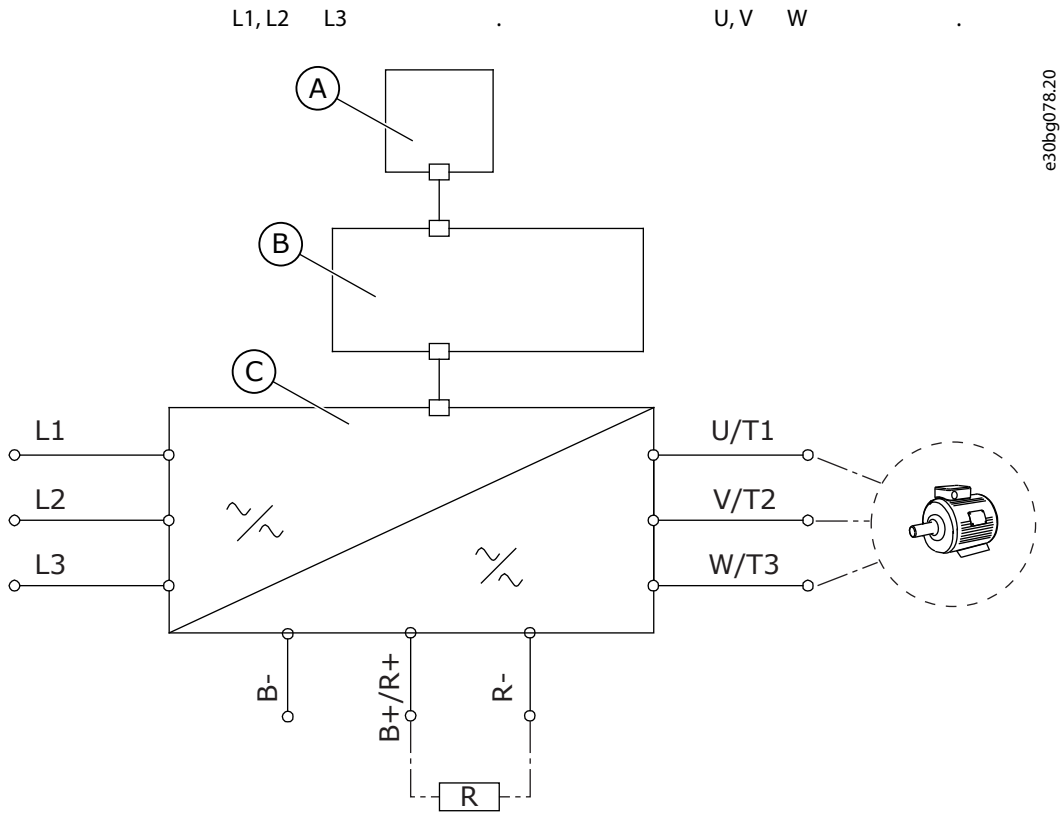


1 , Ø= 13 mm (0.51 in)



# 6

## 6.1



e30bg078.20

13:

<p>A</p> <p>B</p>	<p>C</p>
-------------------	----------

EMC [6.2 EMC](#)

### 6.1.1

+70 °C (158 °F)

AC 가

UL [6.1.2 UL](#)

(VACON® AC 3 )

AC

### 6.1.2 UL

UL(Underwriters Laboratories, ) 60 °C 75 °C (140 °F) 167 °F UL

0170 2 0168 5 (FR8) 0261 2, 0261 5, 0300 2 0300 5 (FR9) , +90 °C (194 °F)

1

T J 가 , 100 000 rms 600 V

(NEC)

12.6

6.1.3

12.3.1

AC

IEC60364-5-52

- +30 °C
- +70 °C
- 가
- 9

6.3

IEC60364-5-52

6.1.4

12.3.1

AC

(NEC, National Electric Code)

(CEC, Canadian Electric Code)

- +86 °F
- +158 °F
- 가
- 9

NEC CEC

NEC CEC

6.1.5

gG/gL (IEC 60269-1)

가

12.3.1

0.4

aR (UL , IEC 60269-4) gS (IEC 60269-4)

6.1.6

FR4 ~ FR11

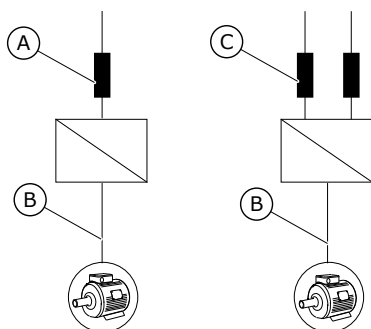
6

14

FR4-9/FR10/  
FR11 0460 6 & 0502 6

FR11 \*)

e30bg080,10



14: FR4 ~ FR11

A	C
B	* FR11 0460 6 0502 6 가

6.1.7

VACON® NXS/NXP AC DC ( ) 가 B-, B+/R+ R-  
 .DC B- B+ R+ R-  
 360° 3 가 2

12.3.1



FR8 가 VACON® .8.7.8.2

6.2 EMC

EMC C1 C2 , 10 360° 가

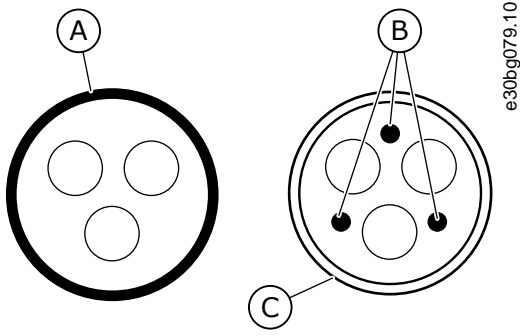
10:

	C1 C2 <sup>(1)</sup>	C3 <sup>(2)</sup>	C4 <sup>(2)</sup>	EMC <sup>(2)</sup>
	가 NKCABLES /MCCMK, SAB/ÖZCUY-J 15	가 NKCABLES/MCMK		15
	가	, NKCABLES/ JAMAK	SAB/ÖZCuY-O	

<sup>1</sup> 1

<sup>2</sup> 2

EMC IEC/EN 61800-3 + A1



15: PE 가

A	PE	C
B	PE	

EMC

IEC 61000-3-12  
120 R<sub>SCE</sub>

EMC 가

S<sub>SC</sub>가 120 R<sub>SCE</sub>

S<sub>SC</sub>가

6.2.1

3-300 A, EMC	208-240 V C4	261-730 A, <u>6.6 IT</u>	380-500 V (FR4 ~ FR9)
3-205 A FR4-FR9	380-500 V (	525-690 V 208-240 V)	3000 m FR9-FR11 (
			380-500 V) 2000 m

6.3

AC

⚠ ⚠	
AC	가
- AC	PE

⚠ ⚠	
가 3.5 mA	가
-	

EN 61800-5-1

- 10 mm<sup>2</sup> Cu 16 mm<sup>2</sup> Al
- 가
- 1 2 가

(S) [mm <sup>2</sup> ]	[mm <sup>2</sup> ]
S ≤ 16	S

(S) [mm <sup>2</sup> ]	[mm <sup>2</sup> ]
16 < S ≤ 35	16
35 < S	S/2

가

가

- 2.5 mm<sup>2</sup>( 가 ),
- 4 mm<sup>2</sup>( 가 ). 가

AC	가	가
----	---	---

- AC	가
------	---

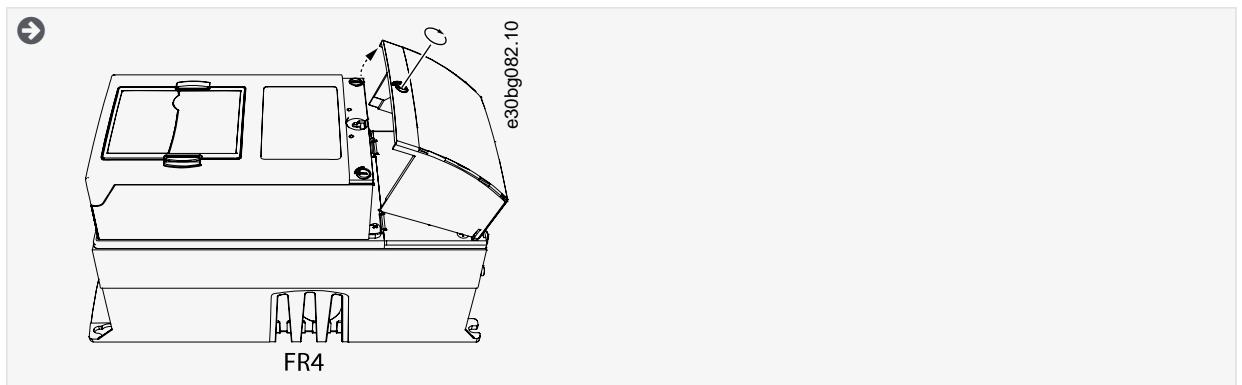
PE	PE	RCD가	(RCD)	B	(RCM)
-		B RCD	RCM		

## 6.4

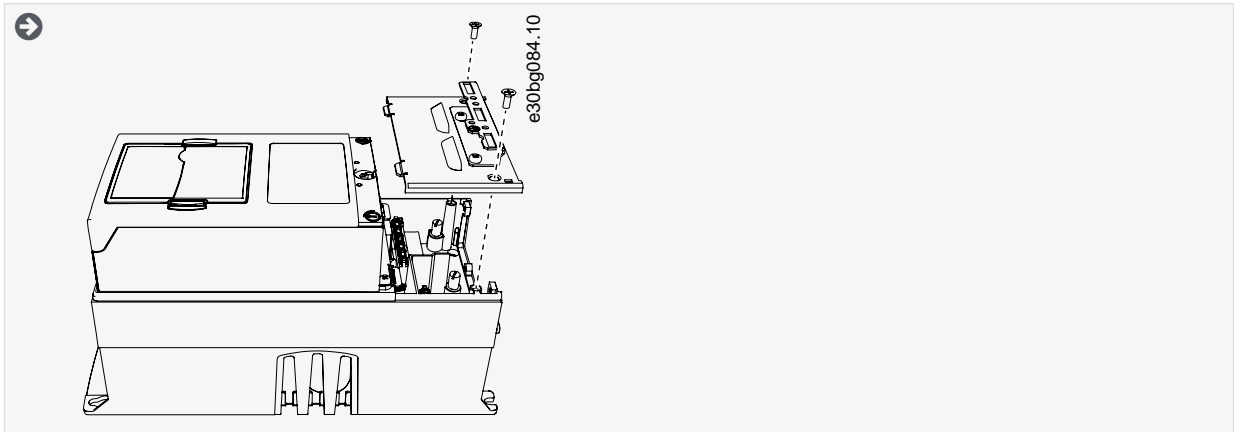
### 6.4.1 FR4/FI4

AC

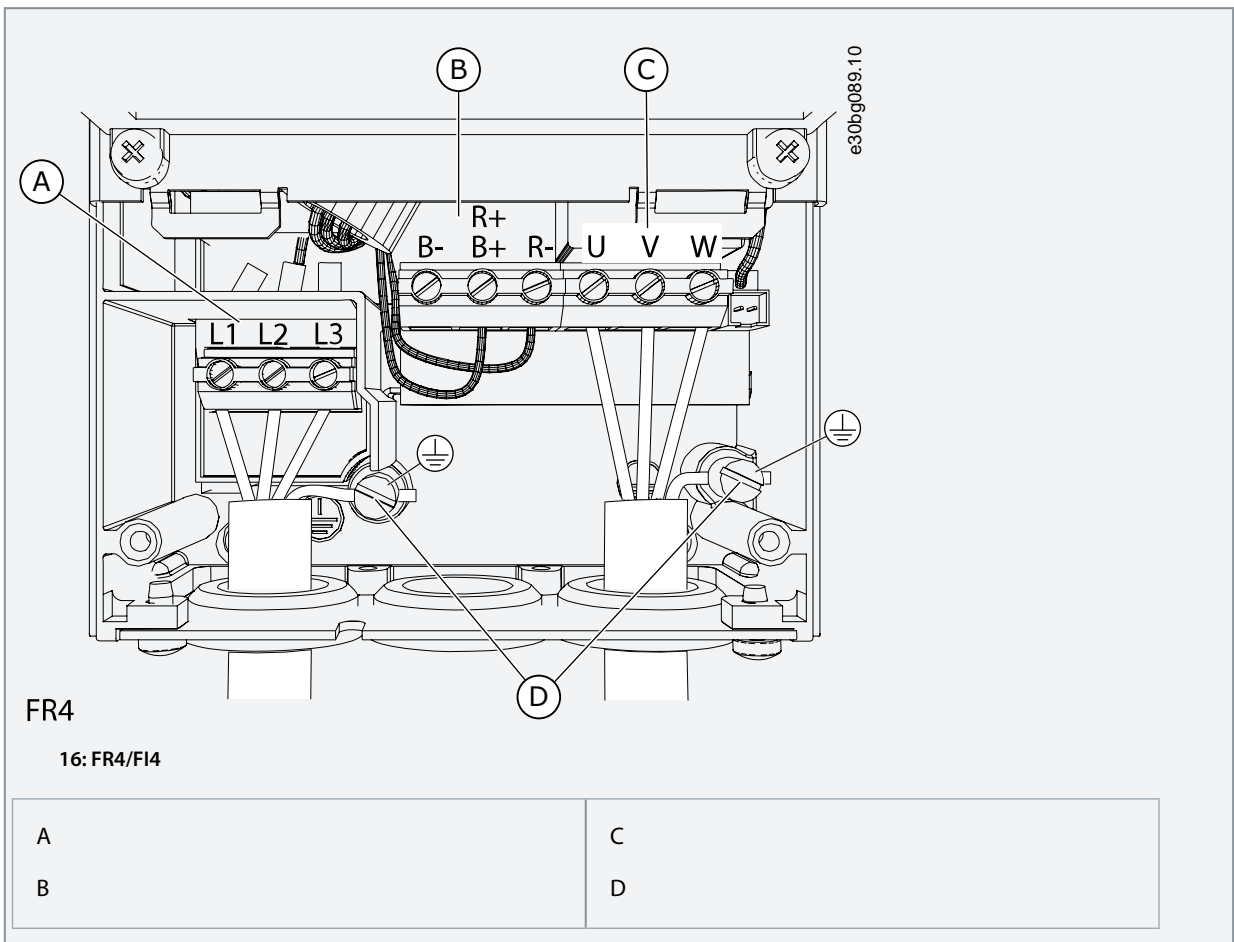
#### 1. AC



#### 2.



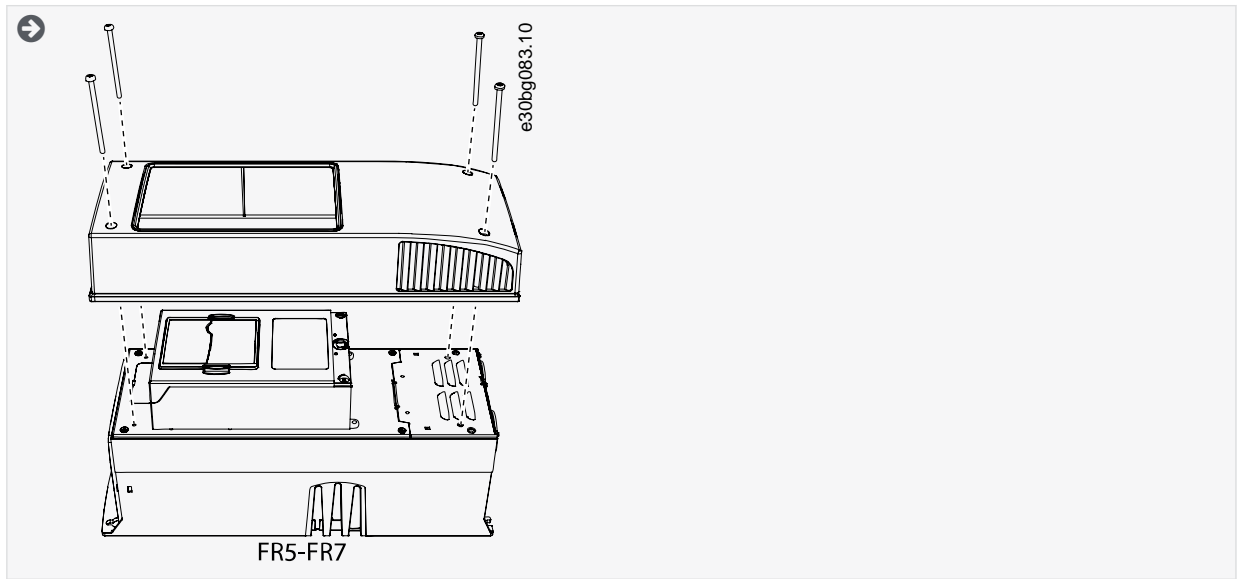
3.



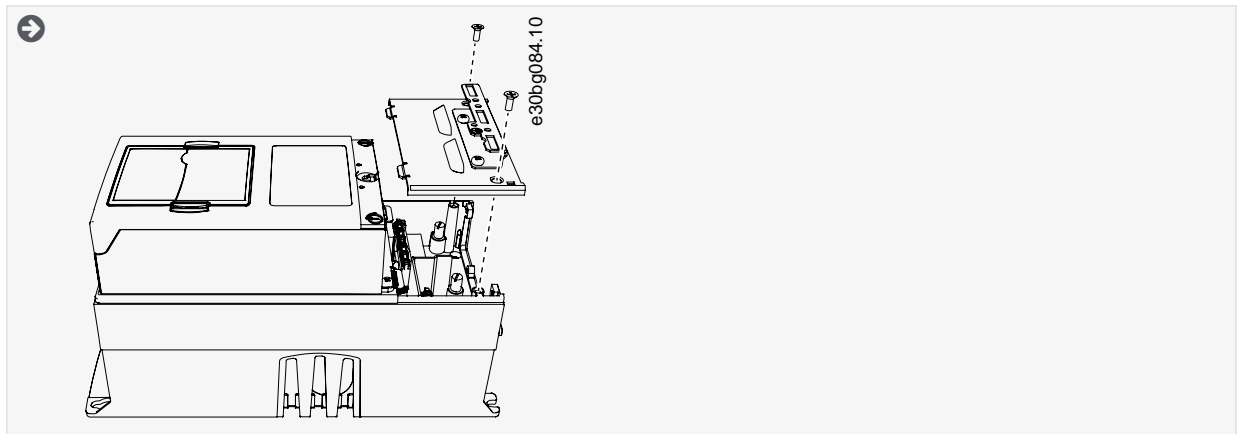
### 6.4.2 FR5

AC

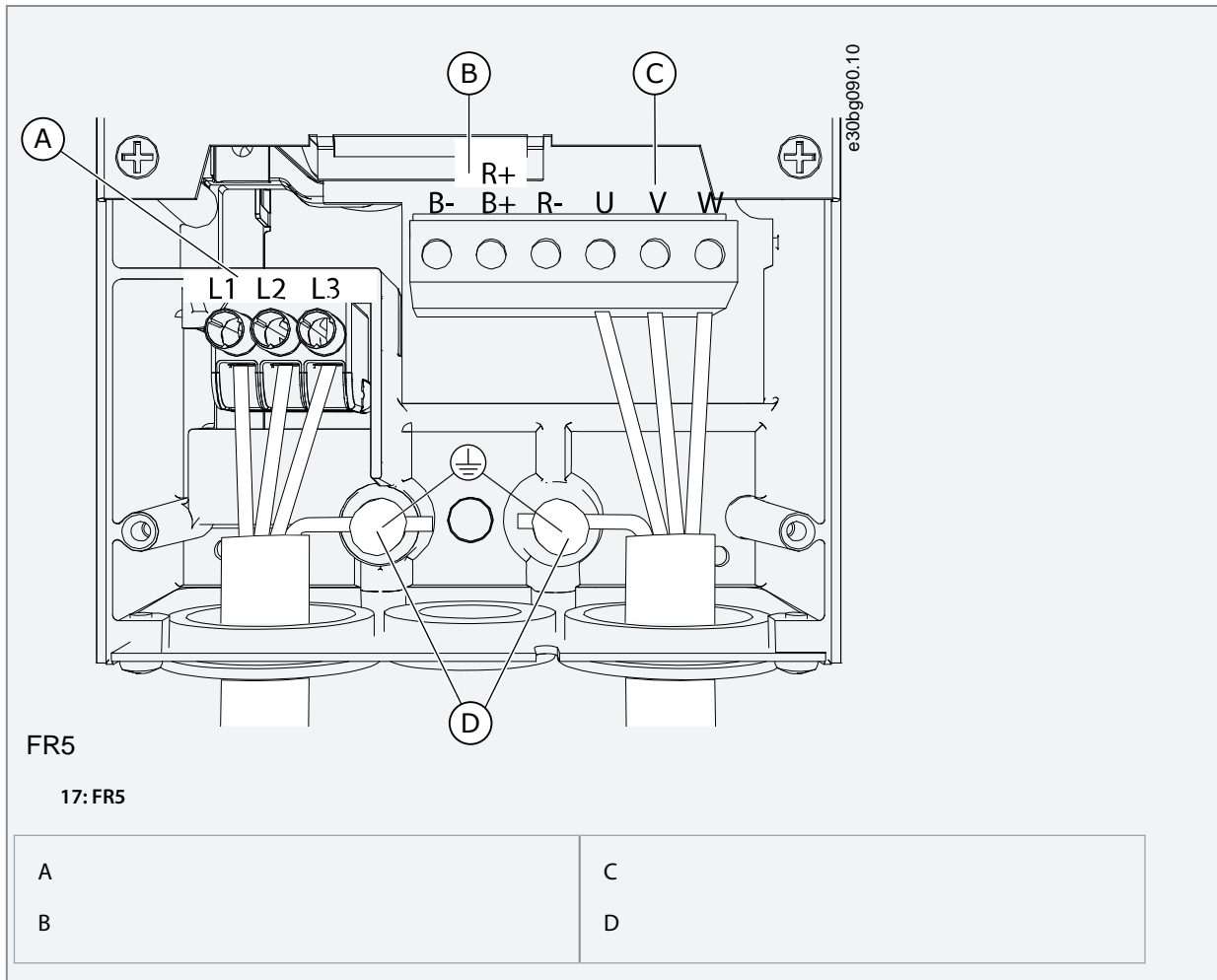
1. AC



2.



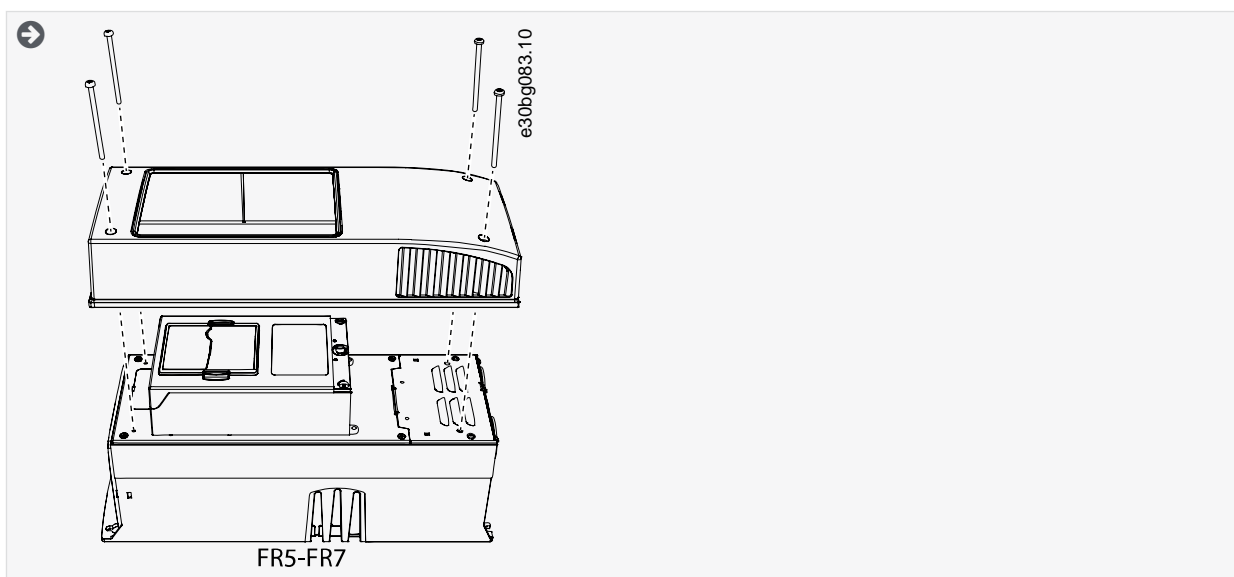
3.



### 6.4.3 FR6/FI6

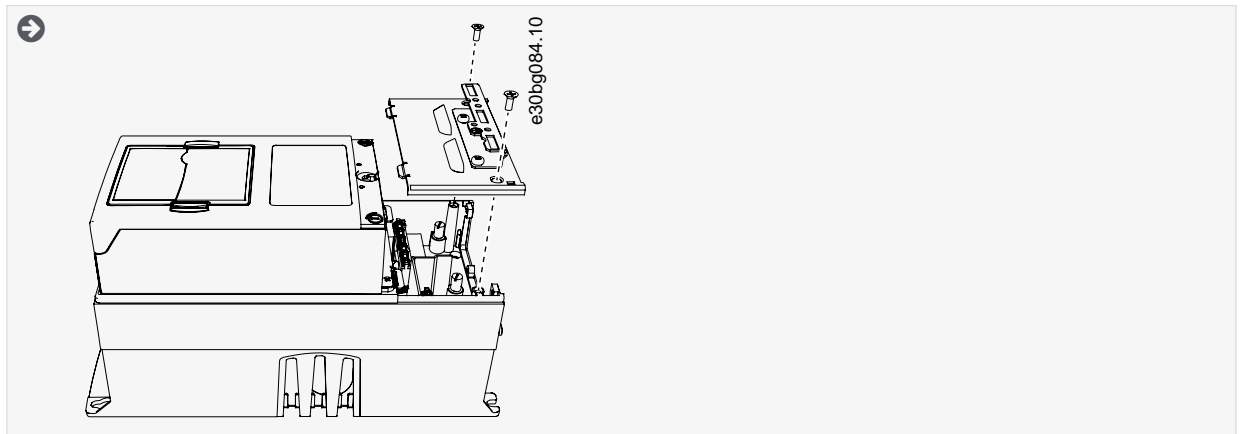
AC

1. AC

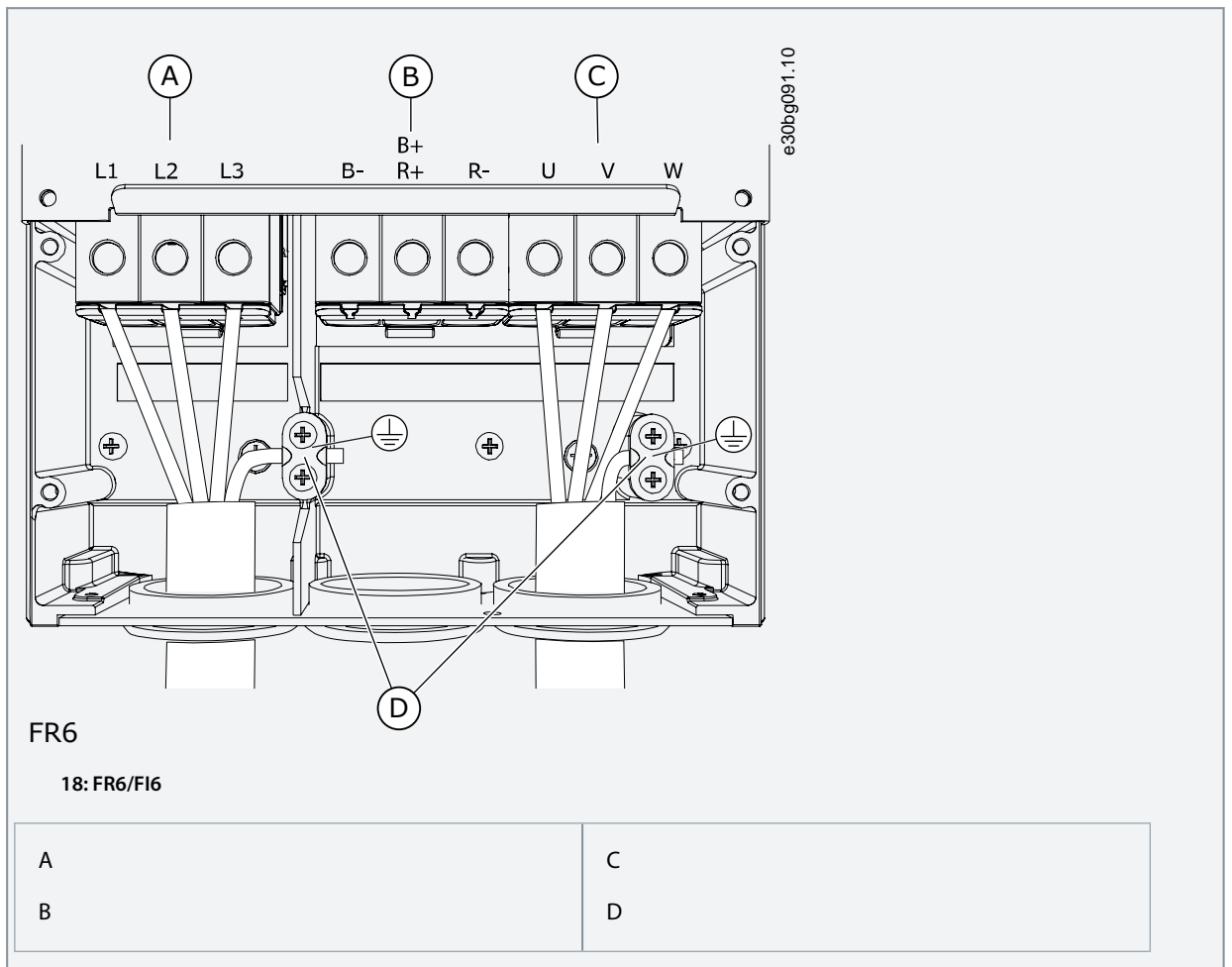


- 2.





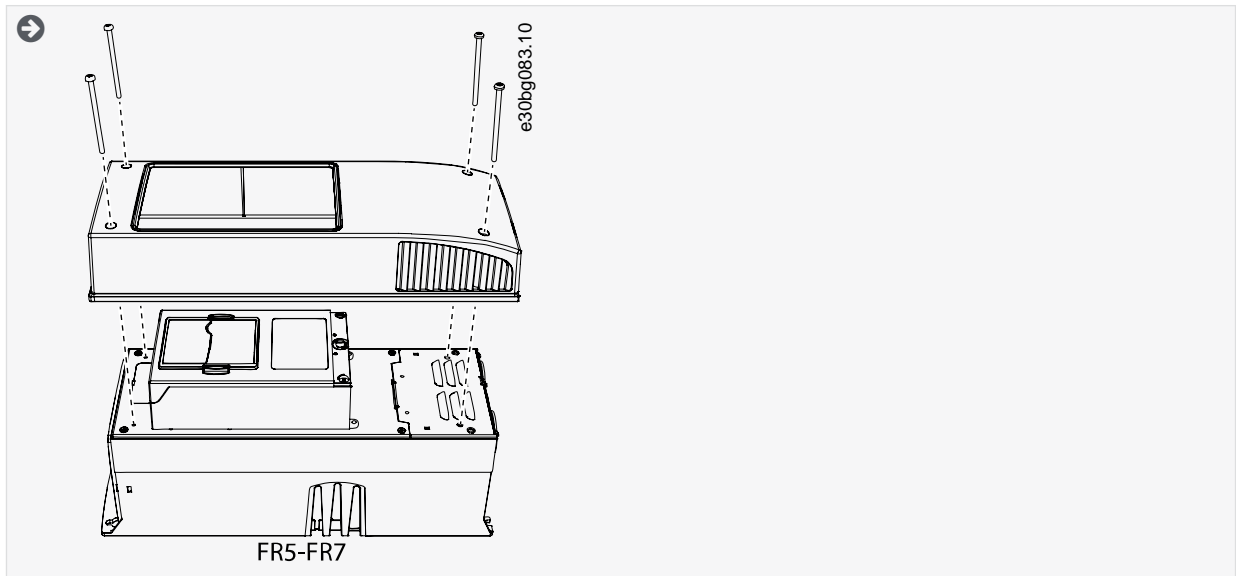
3.



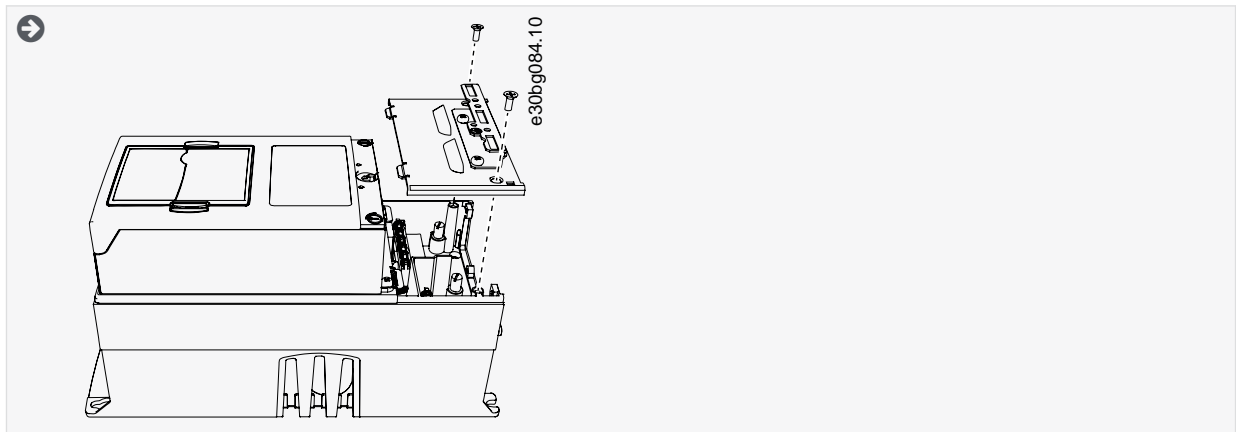
### 6.4.4 FR7/FI7

AC

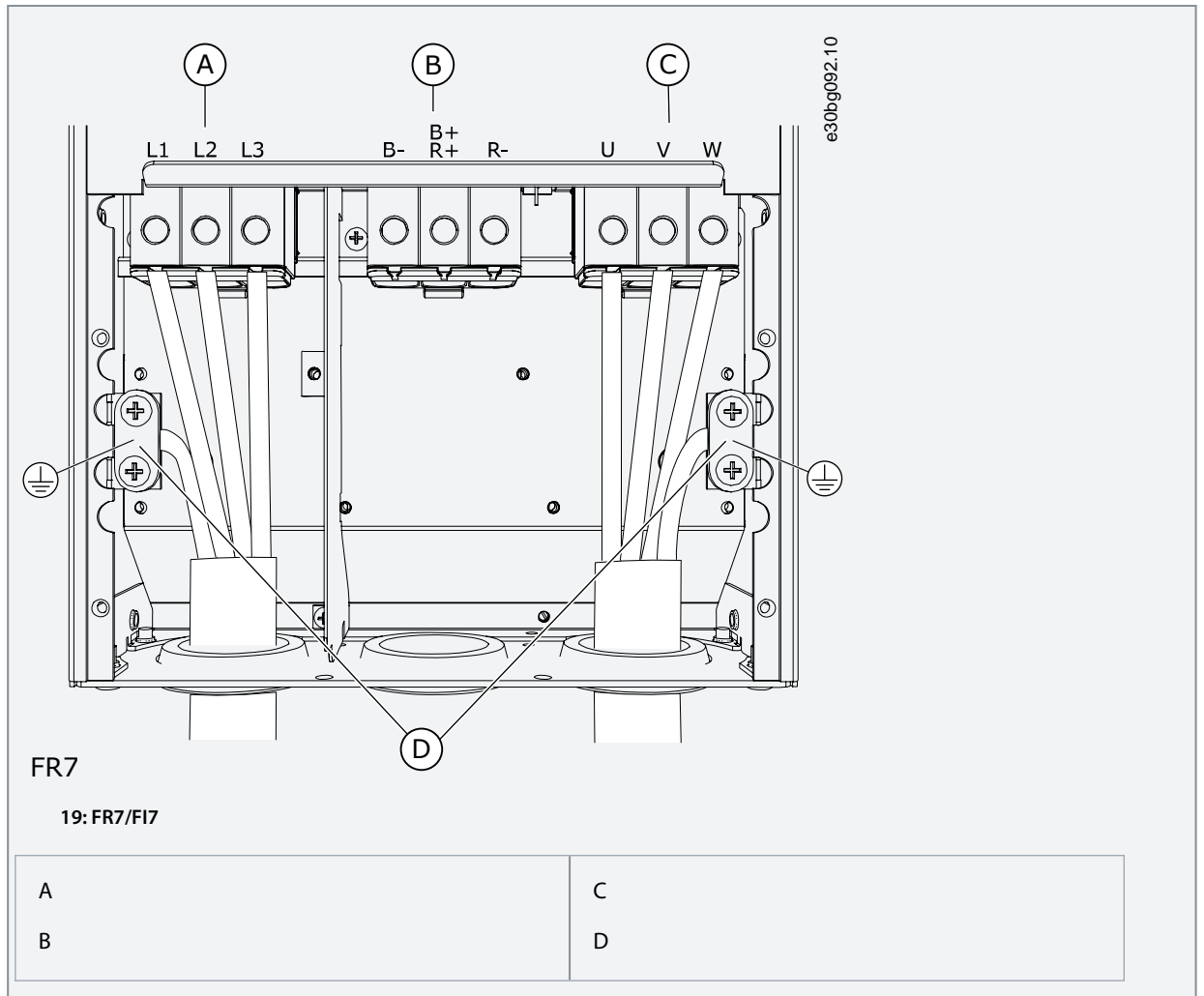
1. AC



2.



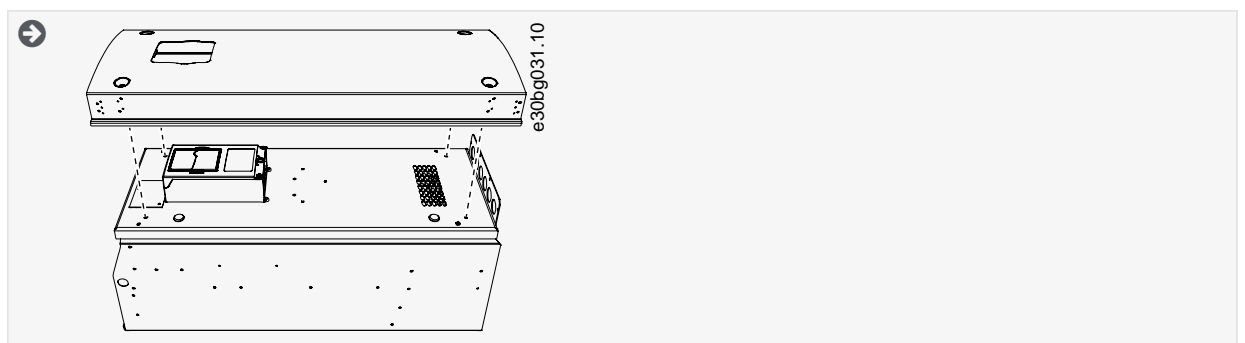
3.



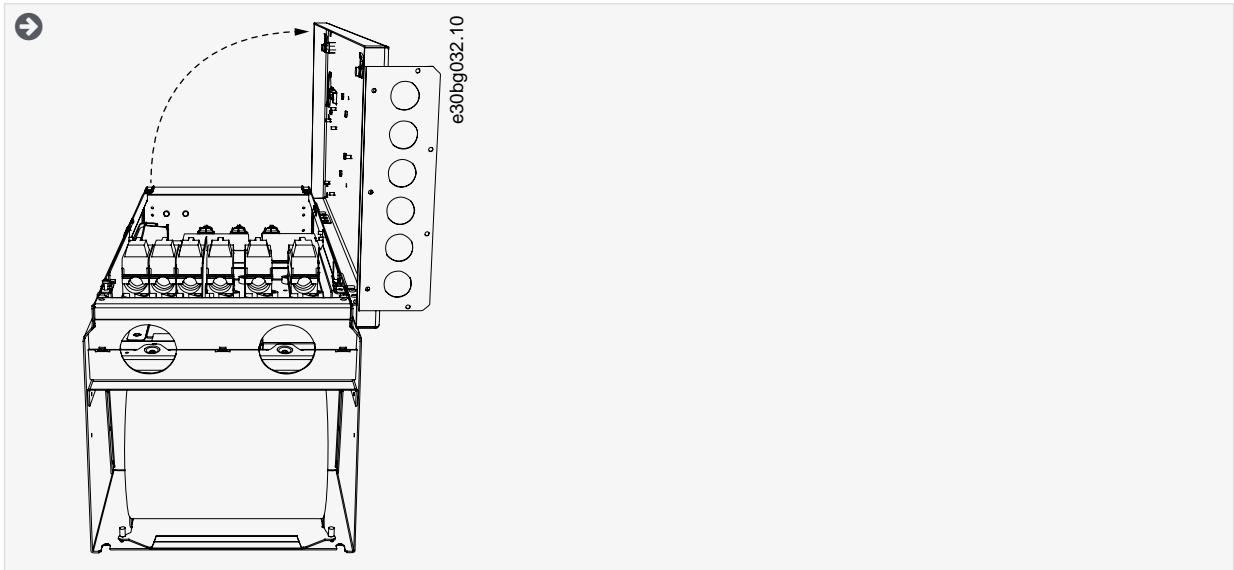
### 6.4.5 FR8/FI8

AC

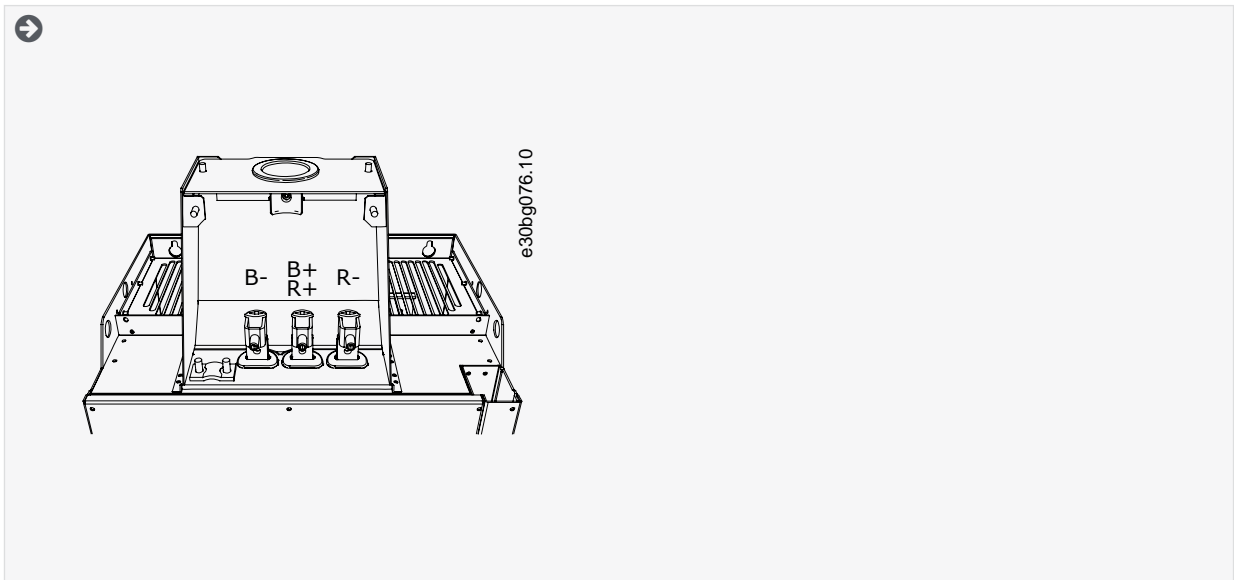
1. AC



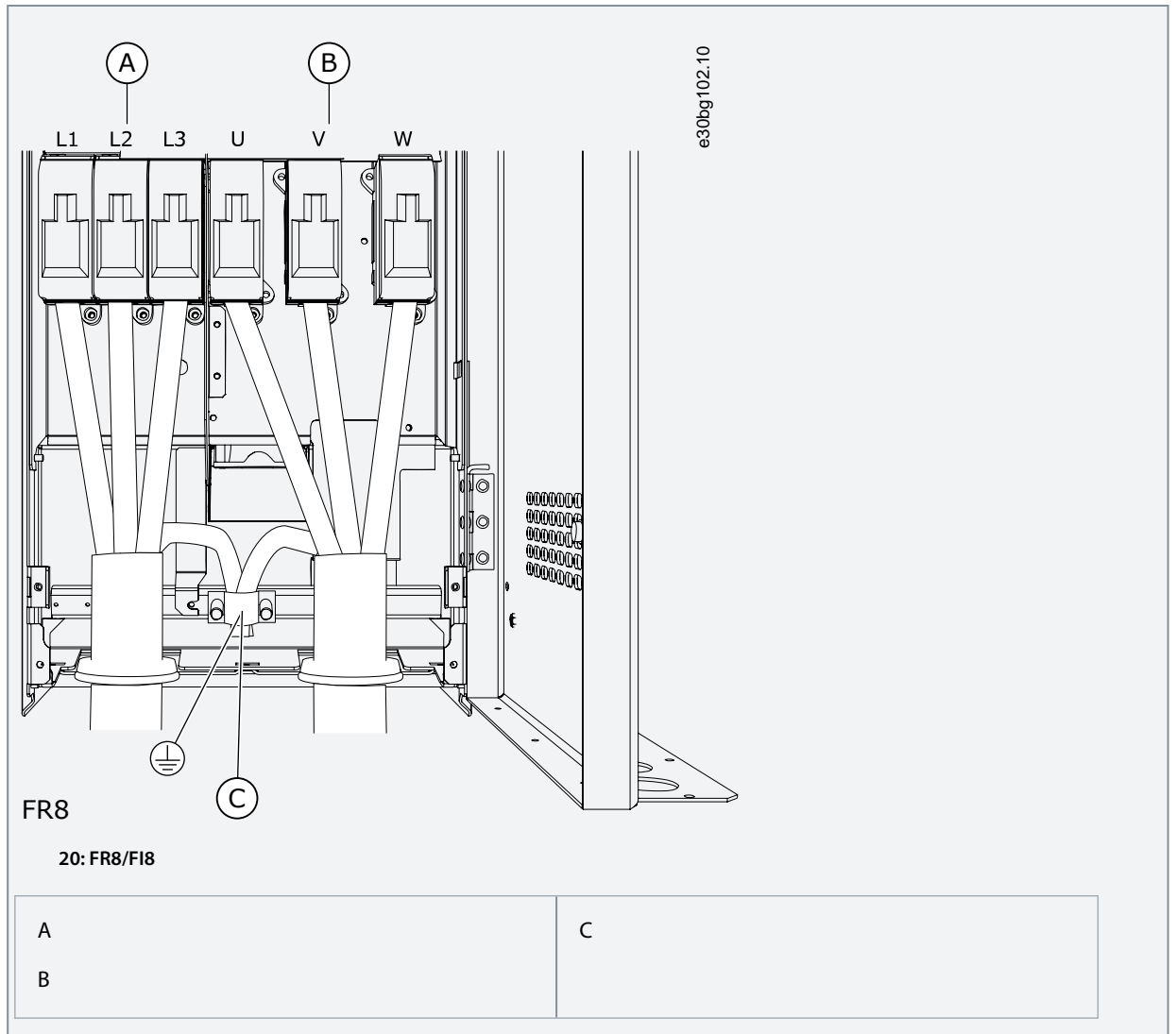
- 2.



3. AC



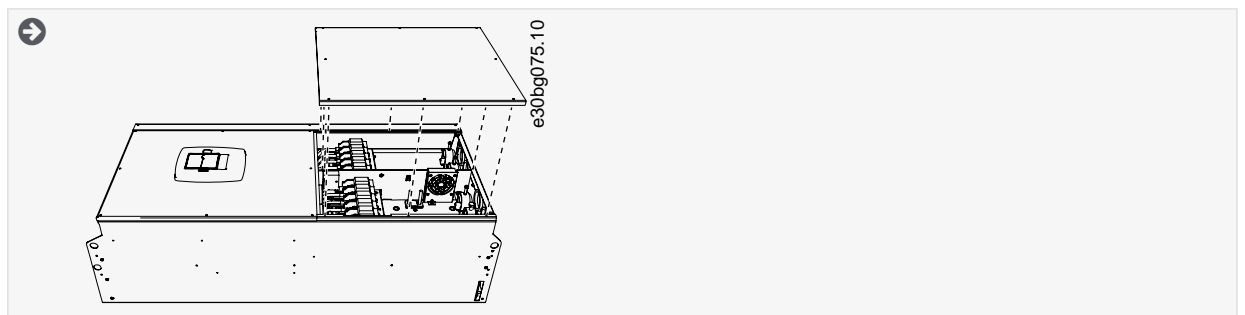
4.



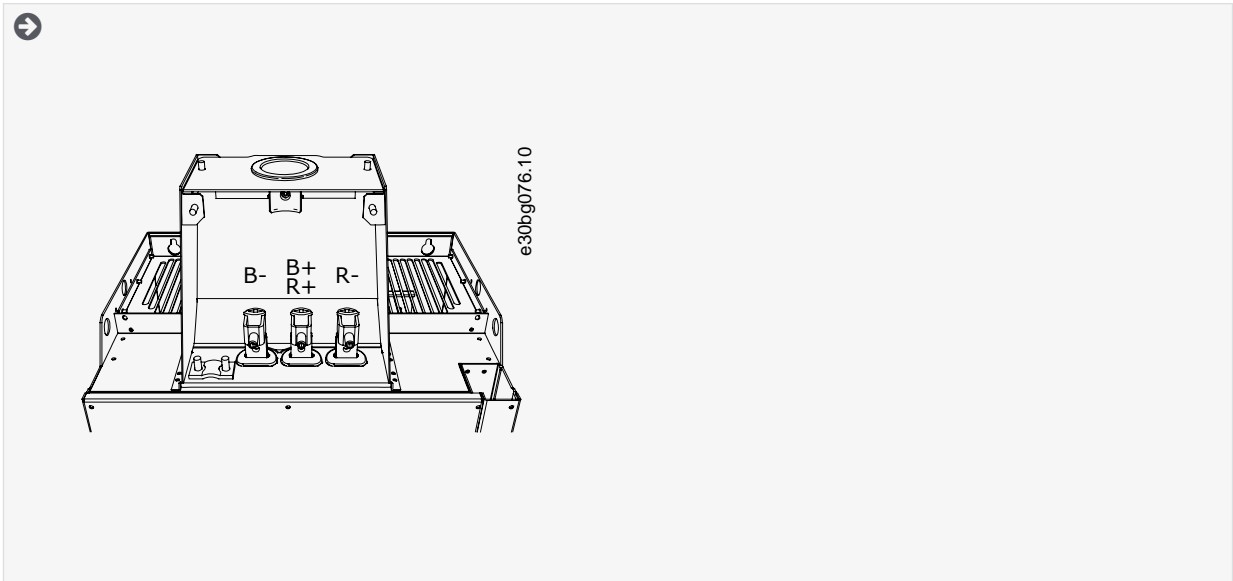
### 6.4.6 FR9

AC

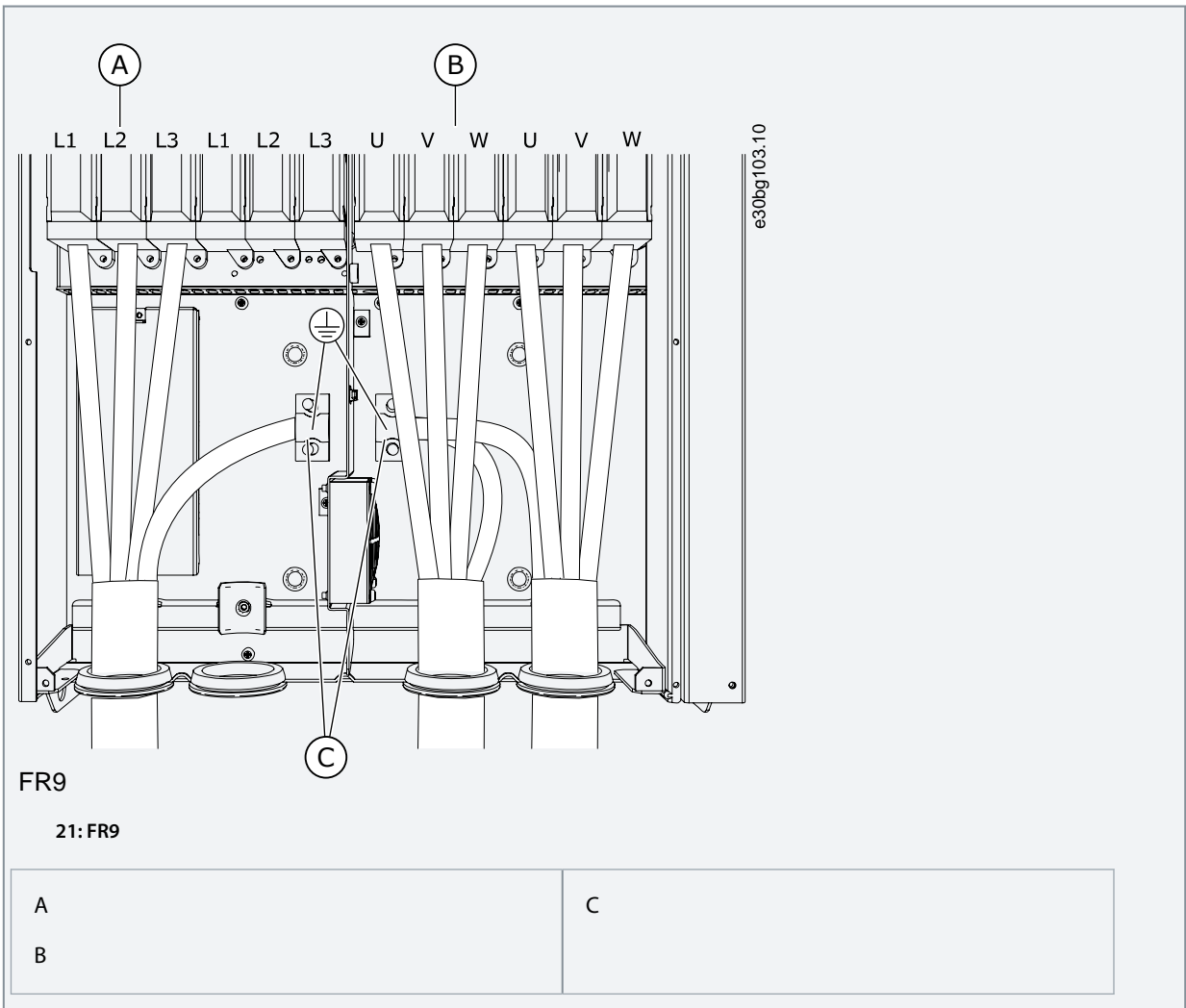
1.



2. AC



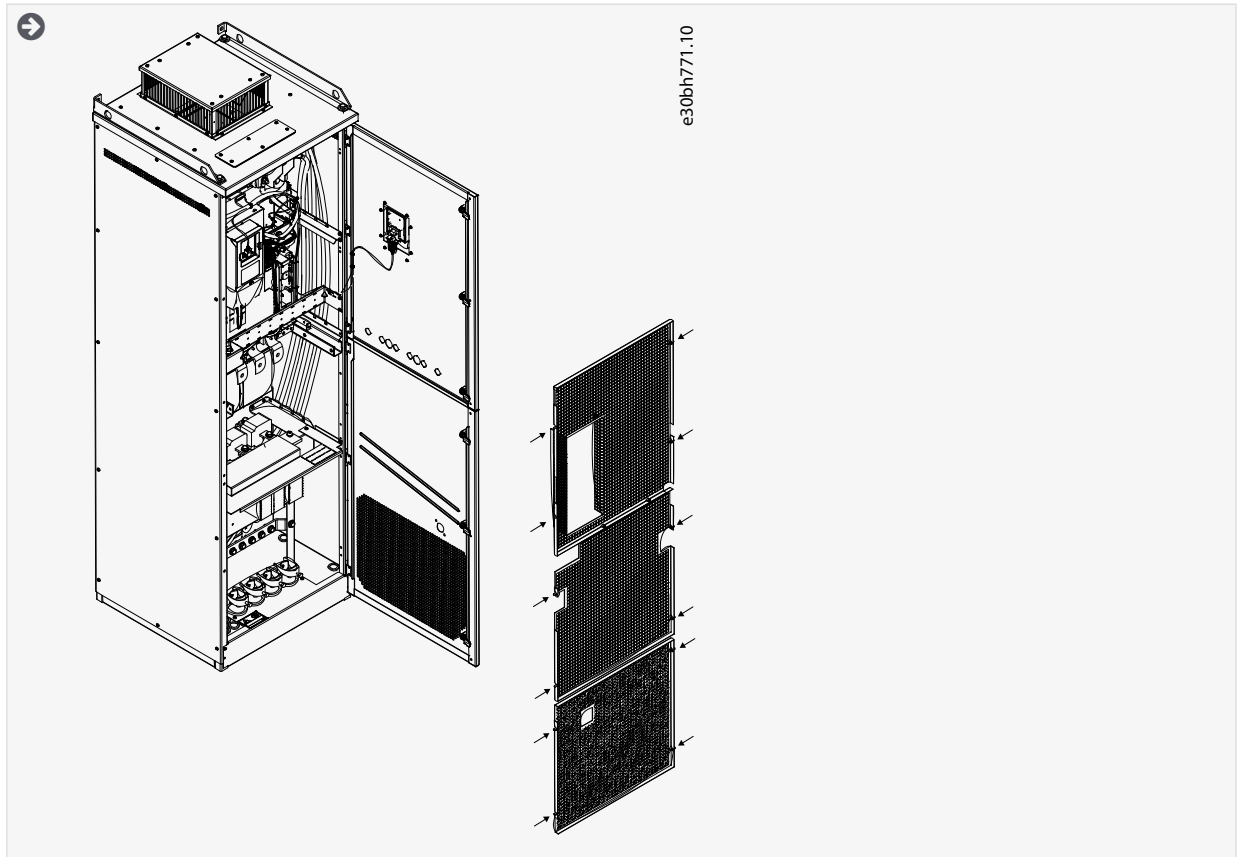
3.



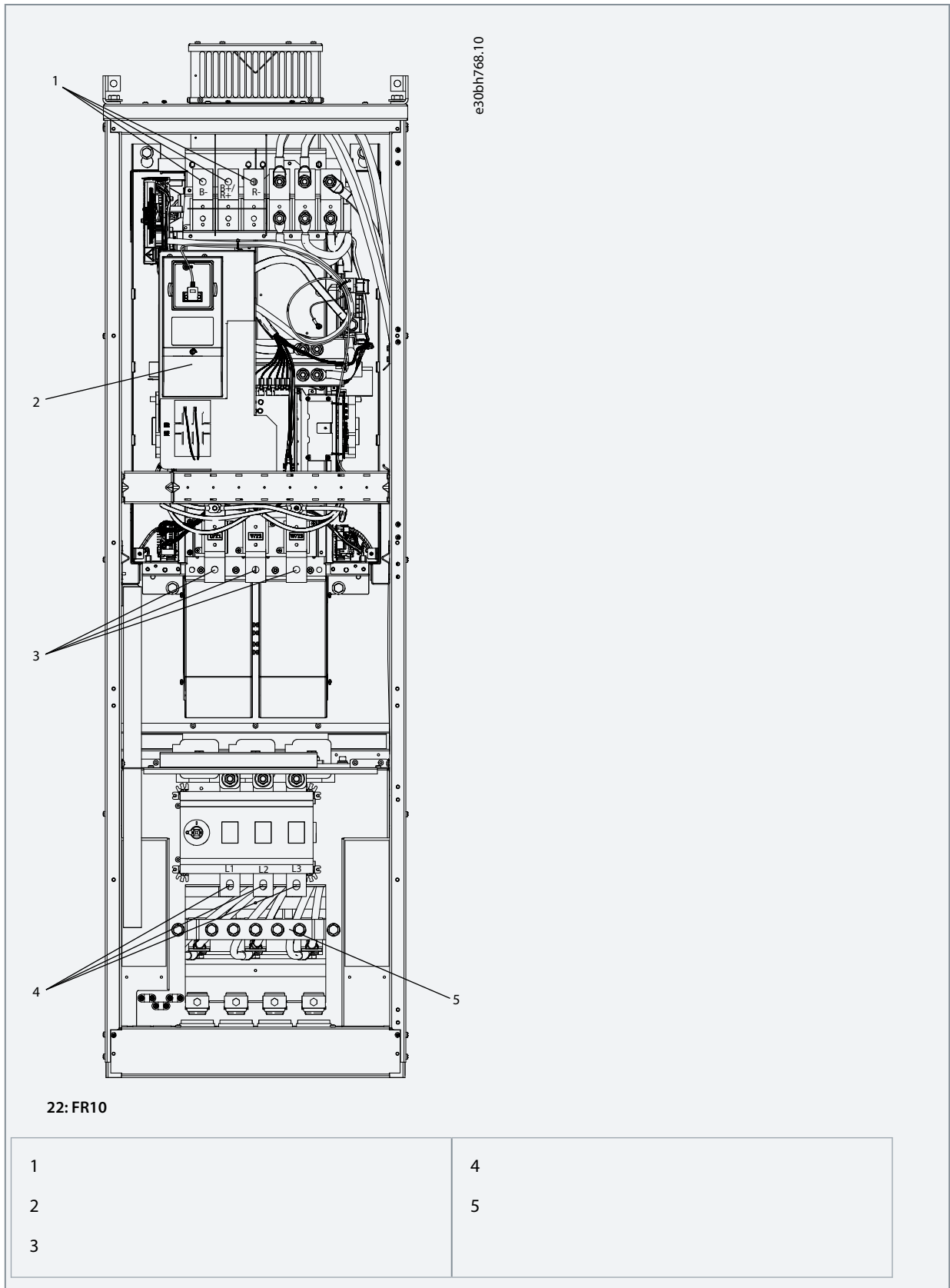
### 6.4.7 FR10 Standalone

AC

- 1.
- 2.



- 3.

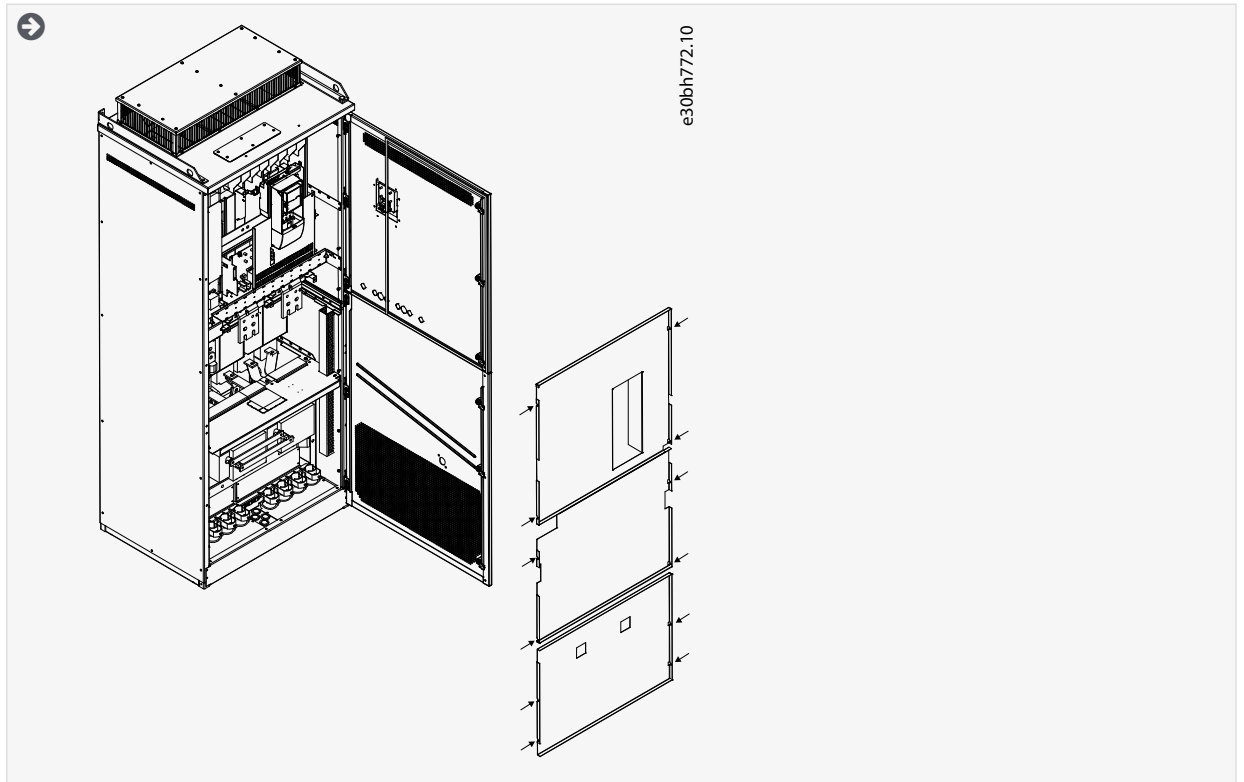


6.4.8 FR11

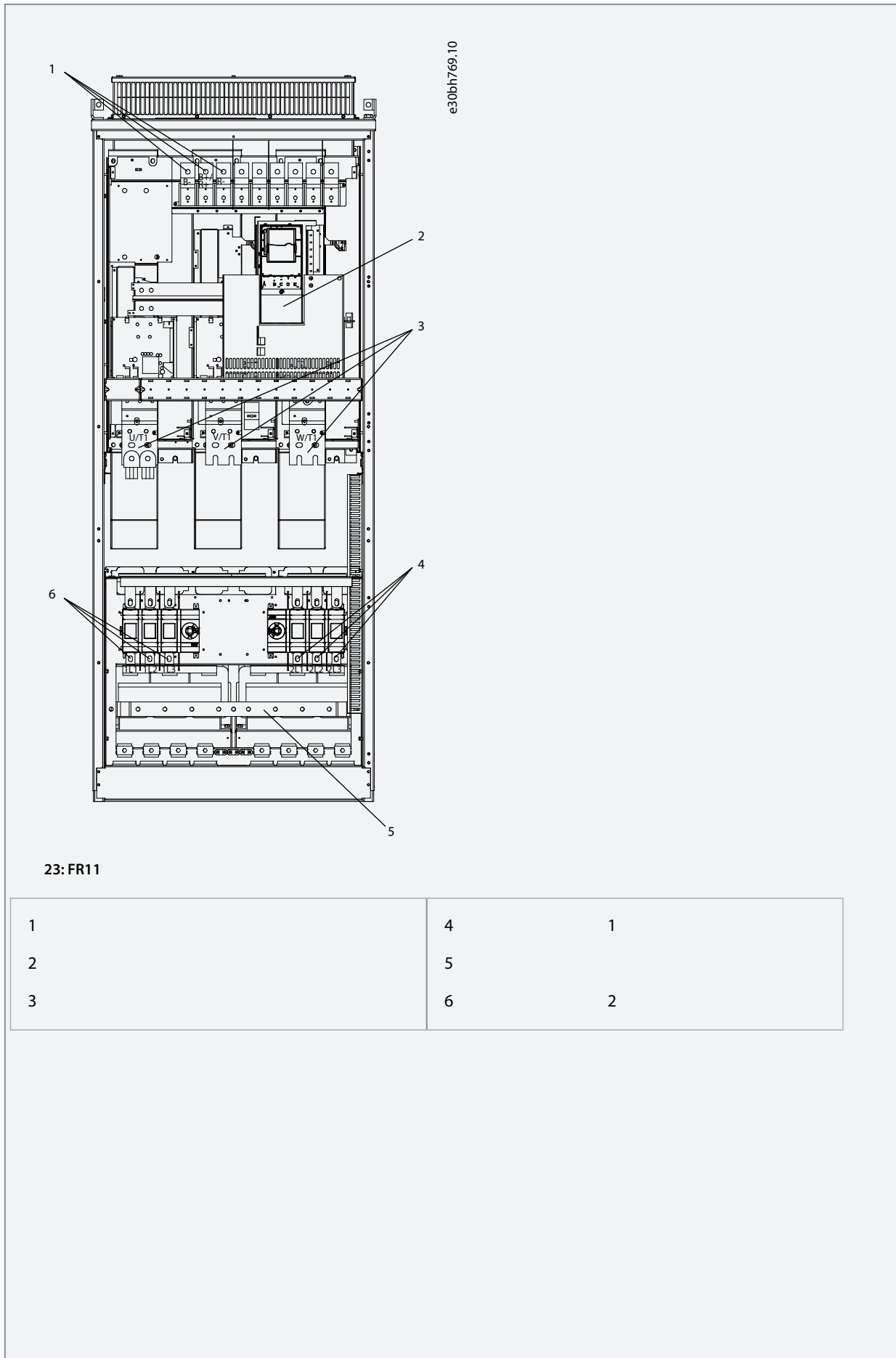
AC

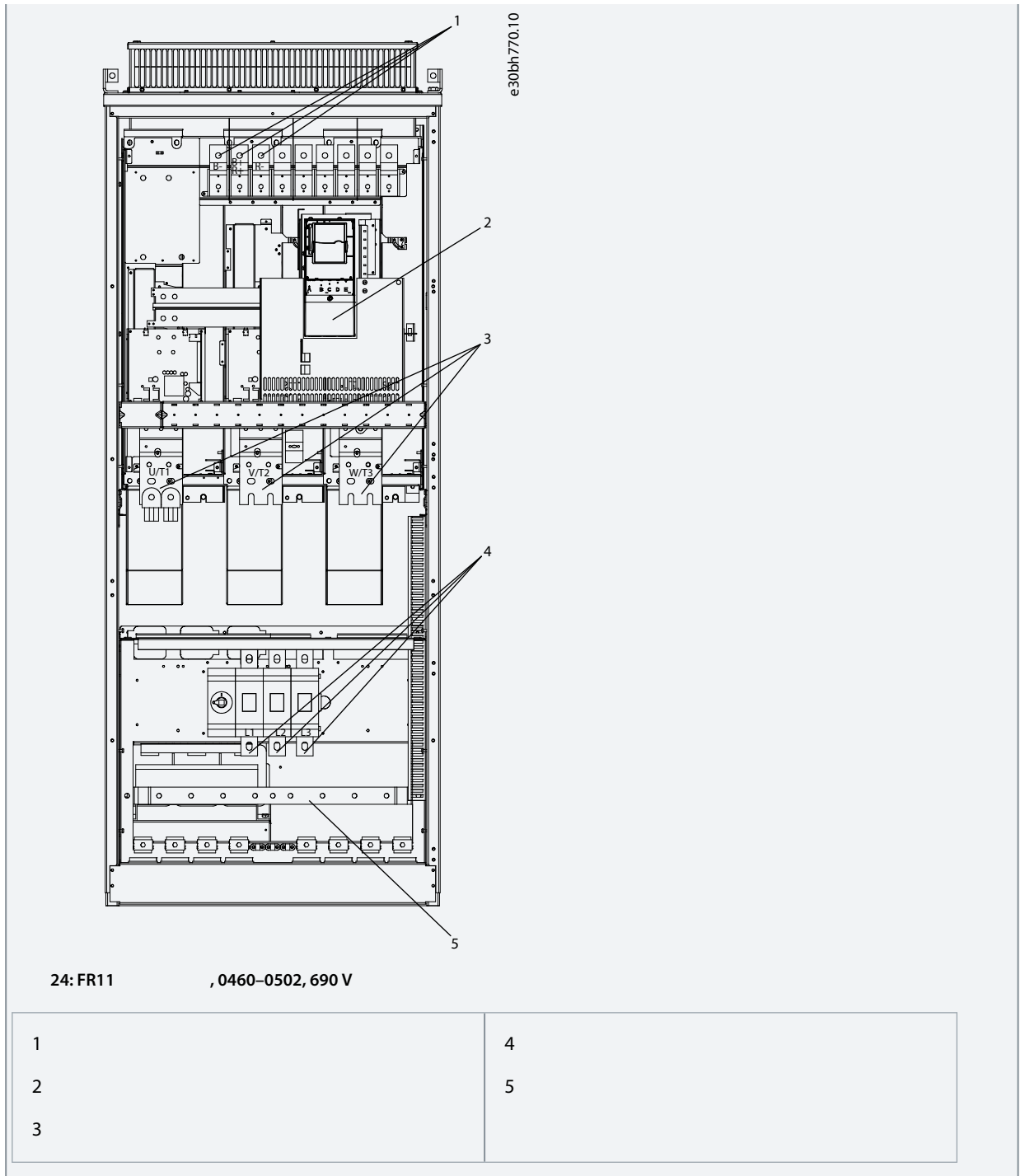


- 1.
- 2.



- 3.





## 6.5

1. [6.5.1](#) 가
2. . AC [3.5](#)

- [6.5.2](#) , FR4-FR6/F14-FI6
- [6.5.3](#) , FR7/FI7
- [6.5.4](#) , FR8/FI8
- [6.5.5](#) , FR9

- [6.5.6](#) , [FR10](#)
- [6.5.7](#) , [FR11](#)

### 6.5.1 가

- AC
- 90°
- 가
- ( [11](#) ).
- 0.75 kW ~ 1.5 kW 300 m (984 ft)( 1-2 HP AC ) 1.5 kW 2 hp AC ) 100 m (328 ft)(

(≤1.5 kW ≤2.01 hp)	( 100 m 328 ft)
가	가

- [9.3](#)

11:

[m]	[m]	[ft]	[ft]
0.3	≤ 50	1.0	≤ 164.0
1.0	≤ 300	3.3	≤ 656.1

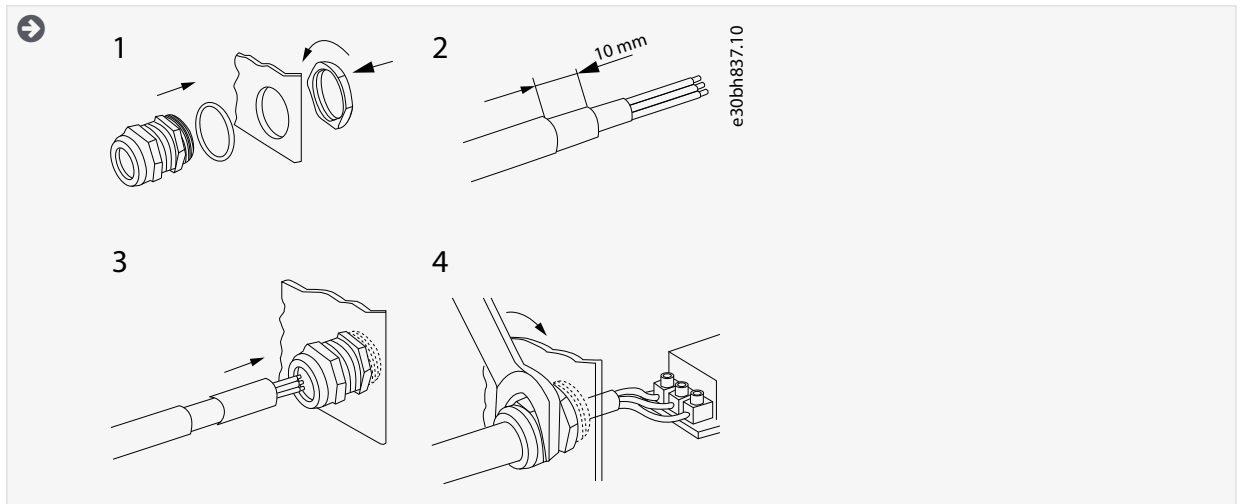
### 6.5.2 , FR4–FR6/FI4–FI6

- UL [6.1.2 UL](#)
- 가 VACON® [8.7.8.2](#)
- ( [4.1](#) )
- [6.4.1 FR4/FI4](#) , [6.4.2 FR5](#) [6.4.3 FR6/FI6](#)

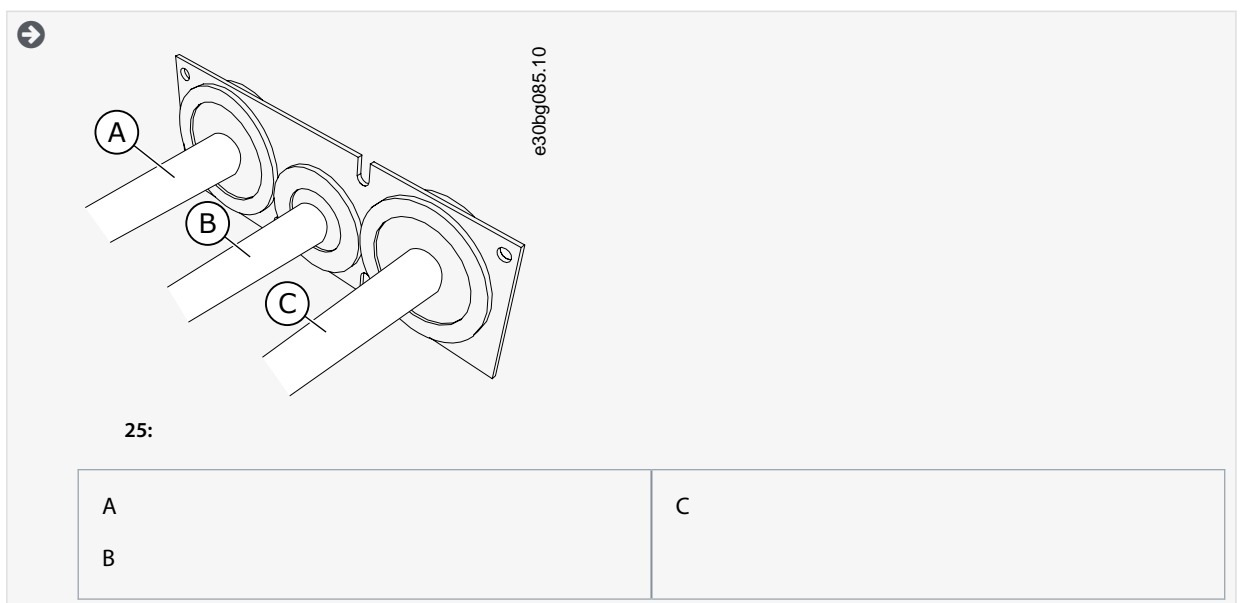
1. [12.4](#)
- 2.



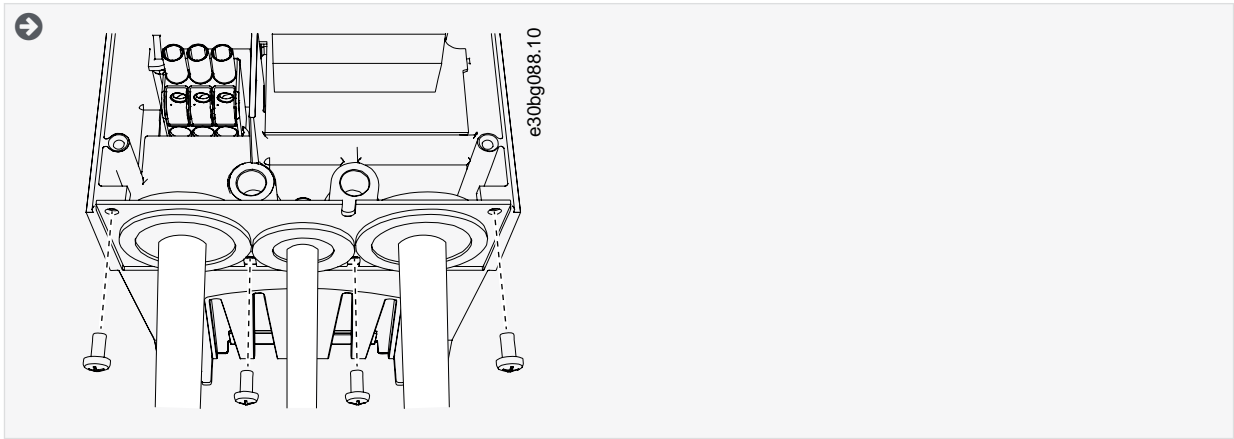
3. EMC C1 C2 EMC



4. ( , ( ))



5. M4x10



6. [12.6](#)

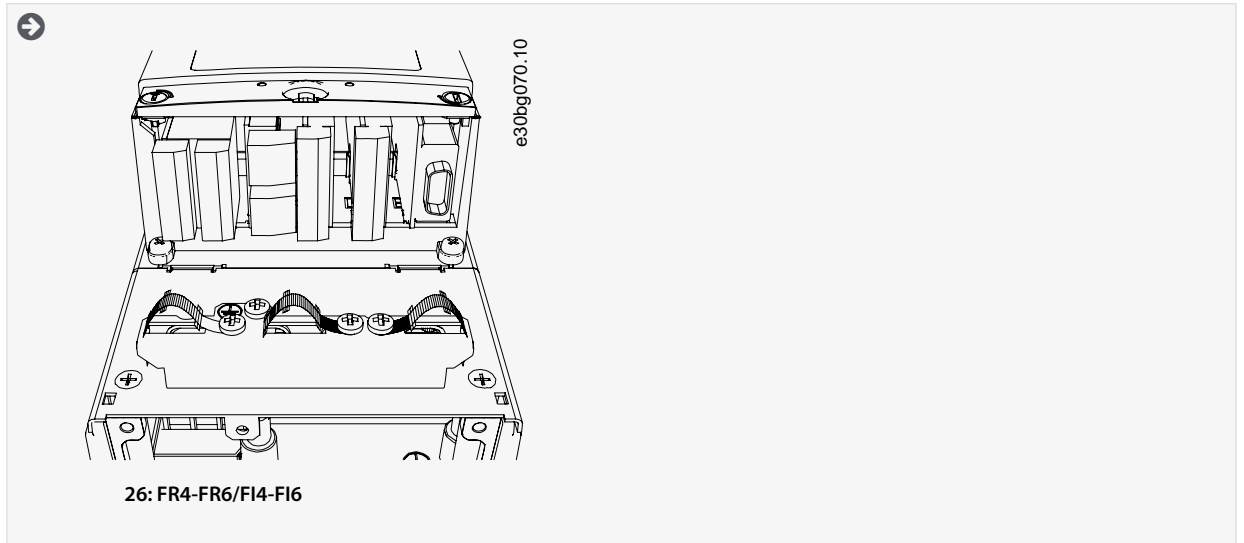
- 
- FR4/FI4, FR5:
- FR6/FI6:

7.

- FR4/FI4 FR5 : IEC/EN 61800-5-1 2 가 [.6.3](#)
- in 가 .M5 2.0 Nm 17.7 lb-

8. [12.5](#)

9. M4x16 3



10.

[12.5](#)

.AC

6.5.3 , FR7/FI7

UL

가

VACON®

[6.1.2 UL](#)

[.8.7.8.2](#)

[\(4.1](#)

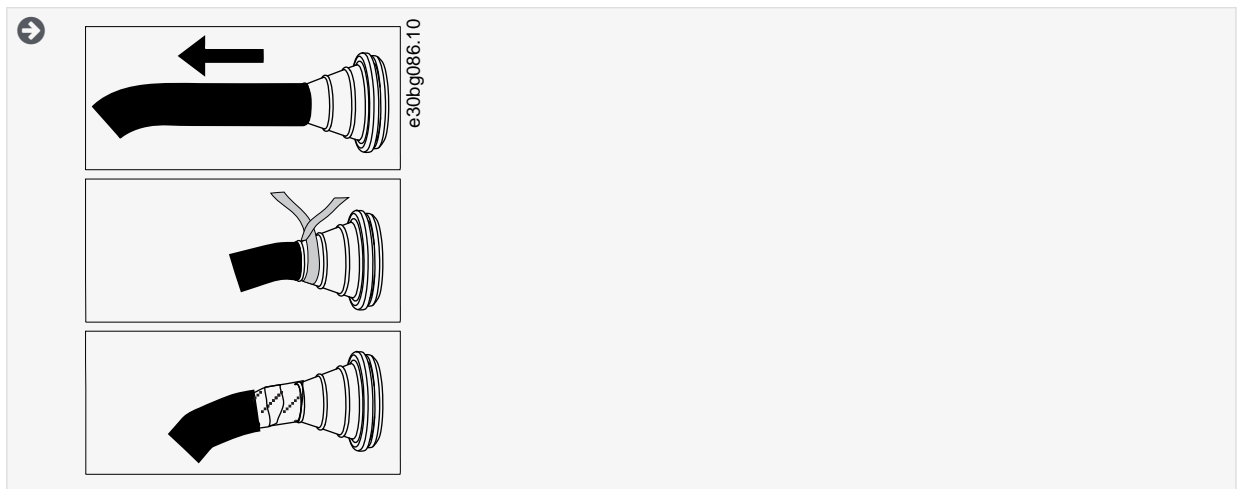
\_\_\_\_\_ ).

[6.4.4 FR7/FI7](#)

1.

2.

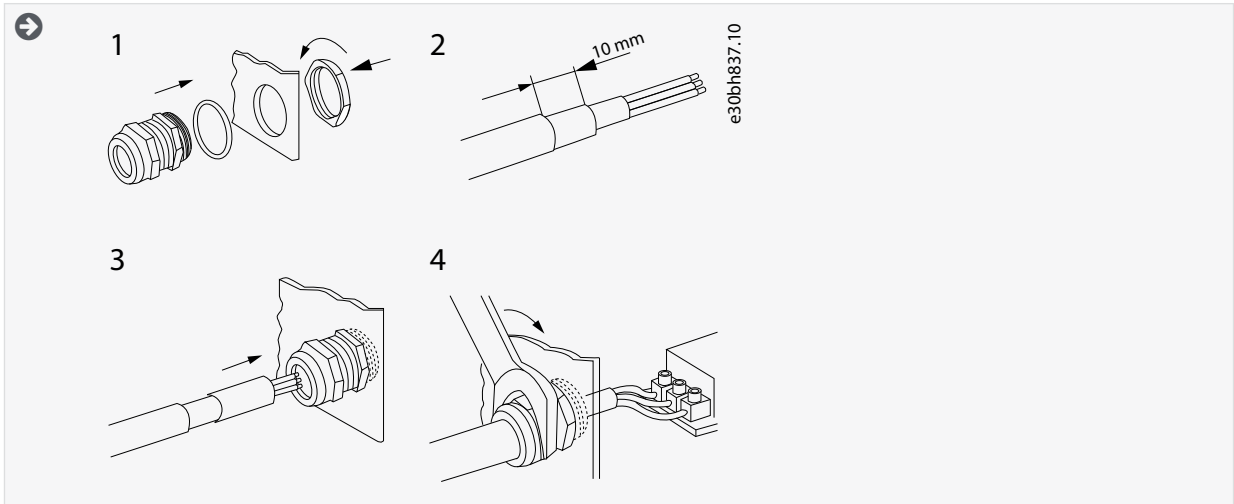
[.12.4](#)



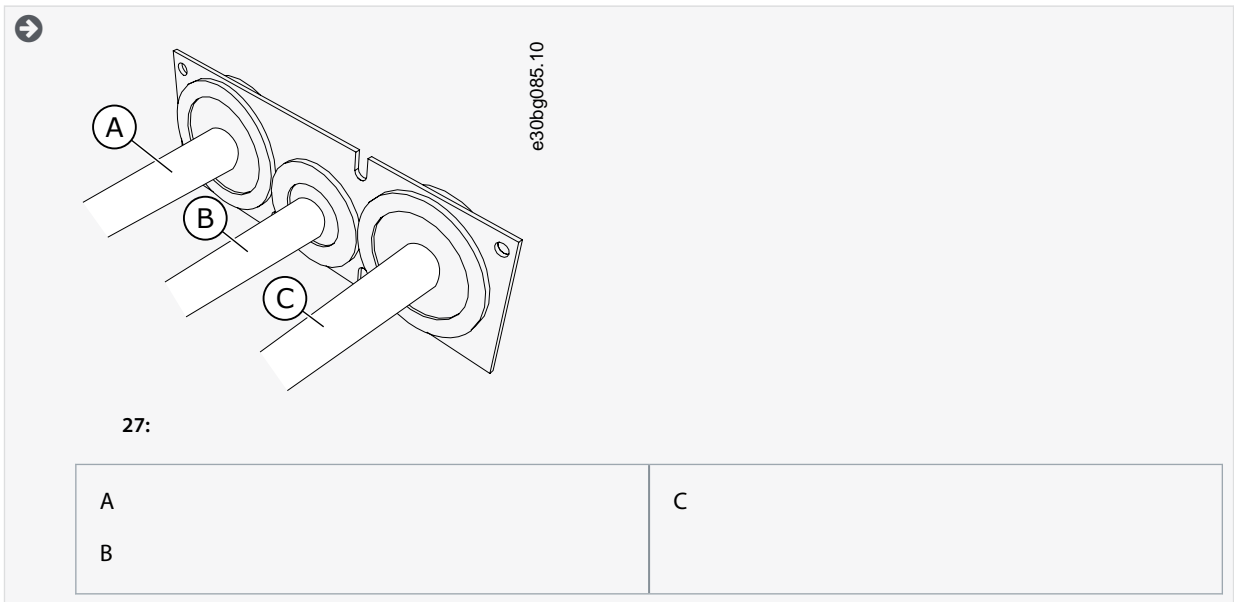
3. EMC

C2

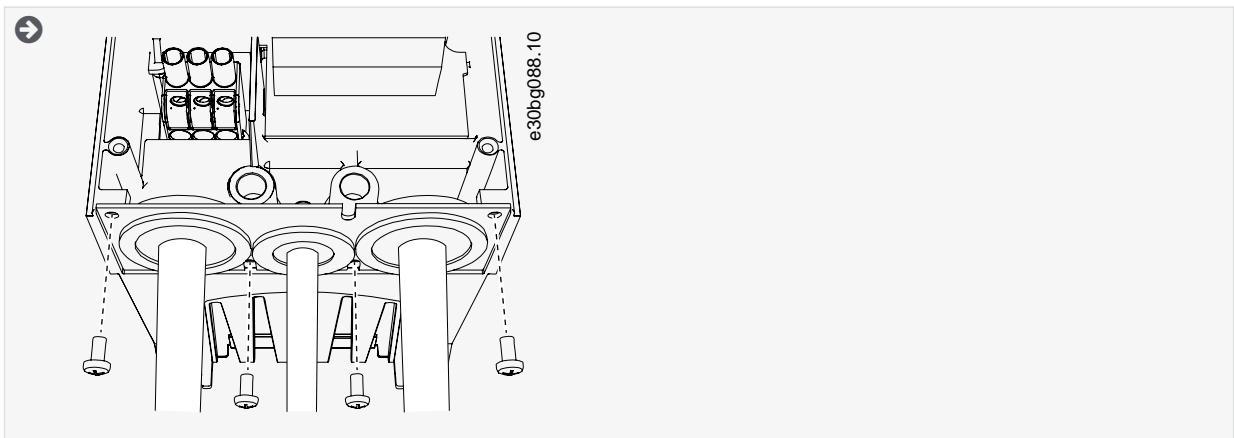
EMC



4. ( , ( ) ) .



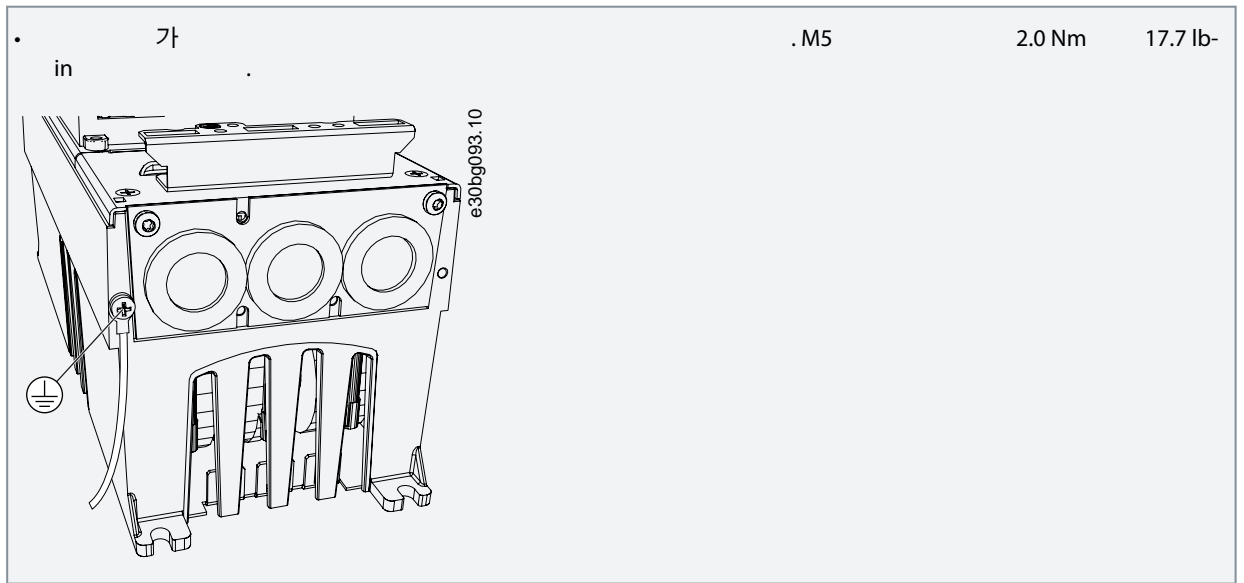
5. M4x10



6. [12.6](#)



7.

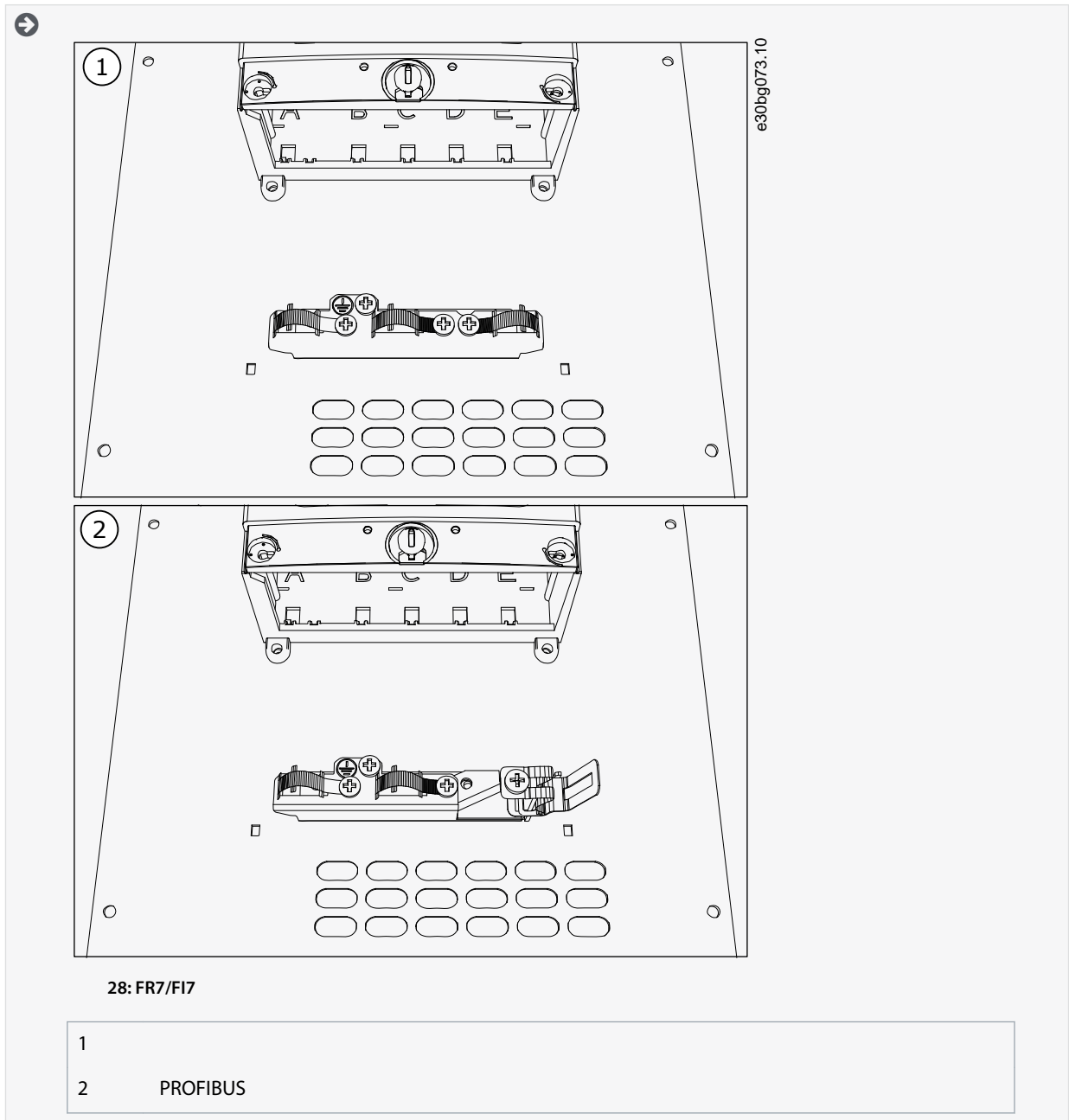


8.

12.5

9.

M4x16 3



10.

[12.5](#)

.AC

### 6.5.4 , FR8/FI8

UL

가

VACON®

[6.1.2 UL](#)

[.8.7.8.2](#)

[\(4.1](#)

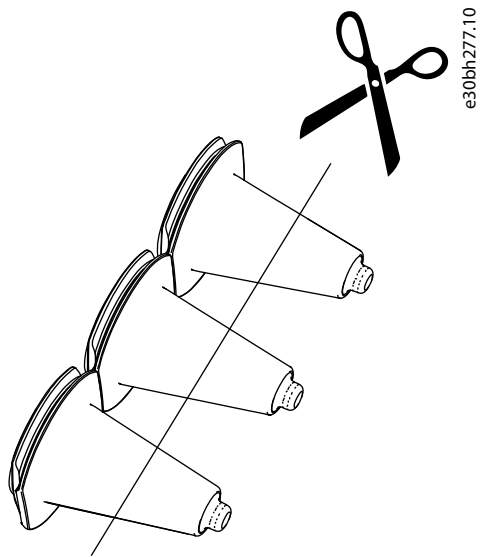
\_\_\_\_\_ ).

[6.4.5 FR8/FI8](#)

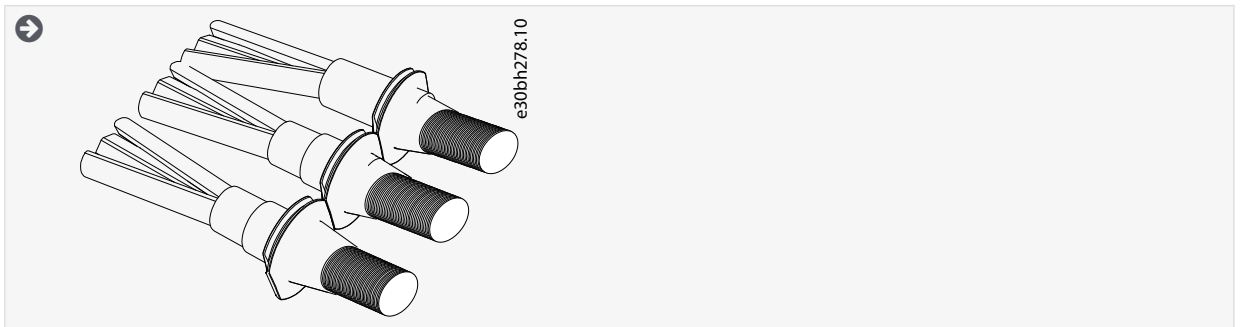
1.

[.12.4](#)

2.

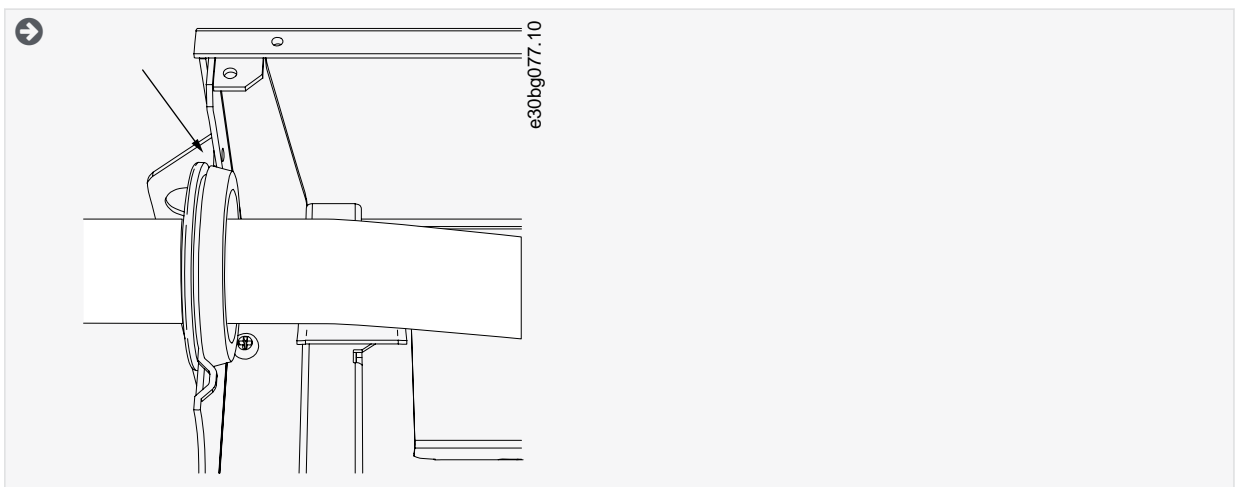


29: IP54



3.

- IP54 (UL 12)
- 가

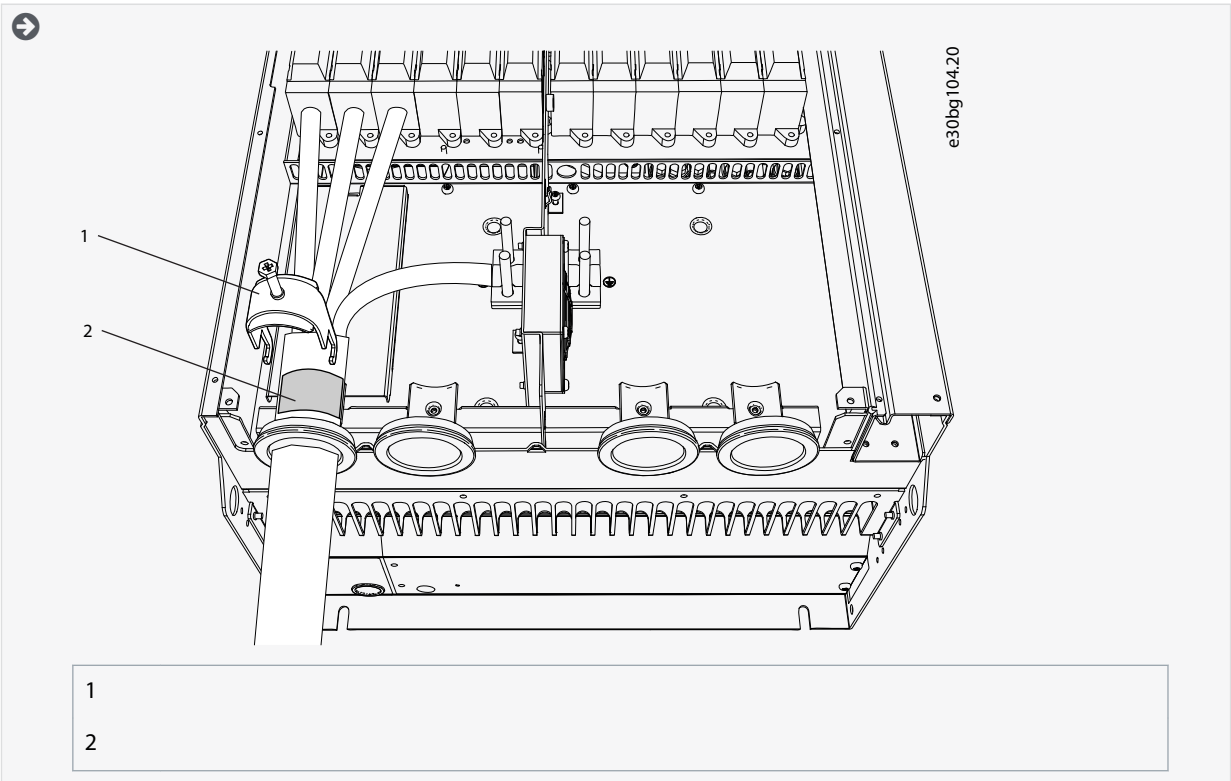


4.

[.12.6](#)

가

5. 360°

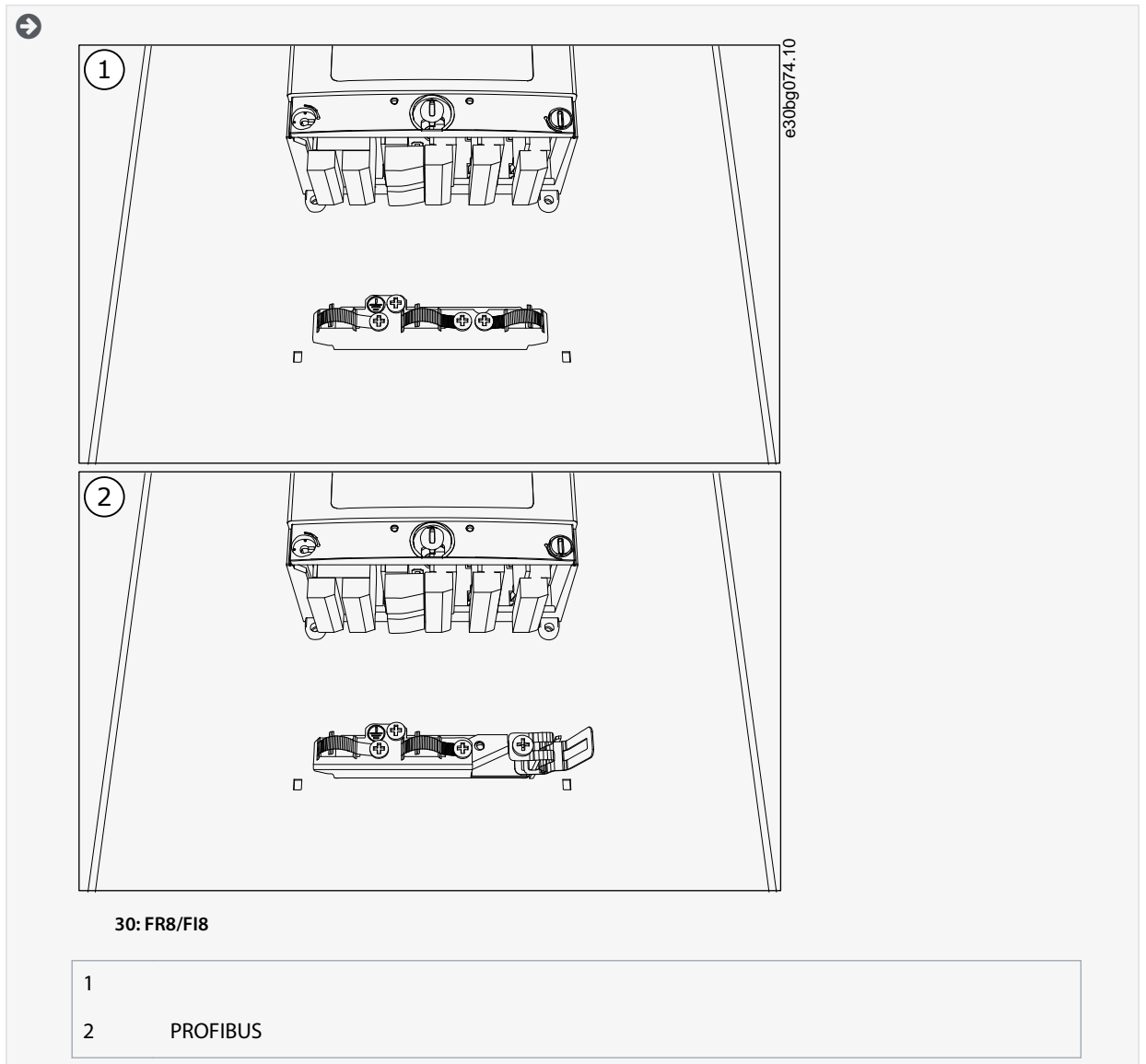


1  
2

6. .AC [12.5](#)

가	:	
•	:	2.4 Nm
•	:	0.8 Nm
•	:	2.4 Nm

7. M4x16



8. [12.5](#)

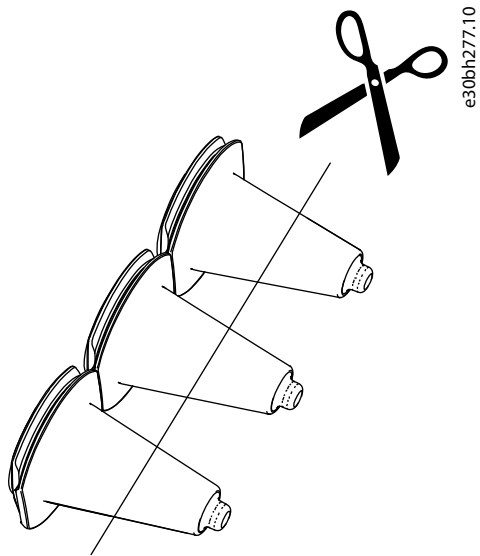
6.5.5 , FR9

UL 가 [6.1.2 UL](#) [8.7.8.2](#)

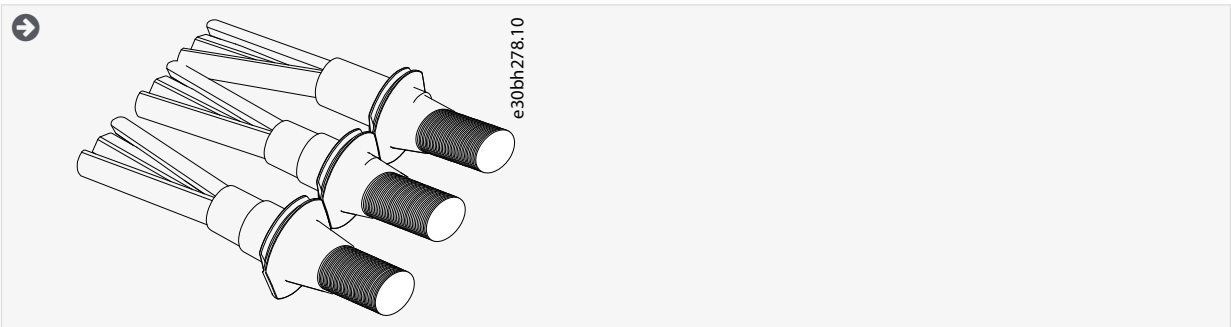
[6.4.6 FR9](#)

1. [12.4](#)

2.

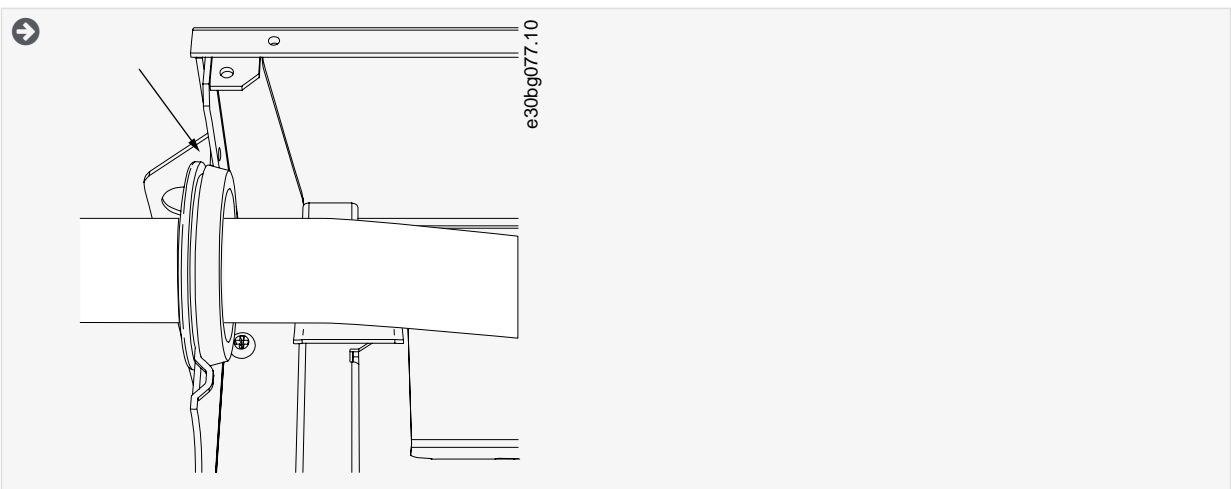


31: IP54



3.

- IP54 (UL 12)
- 가



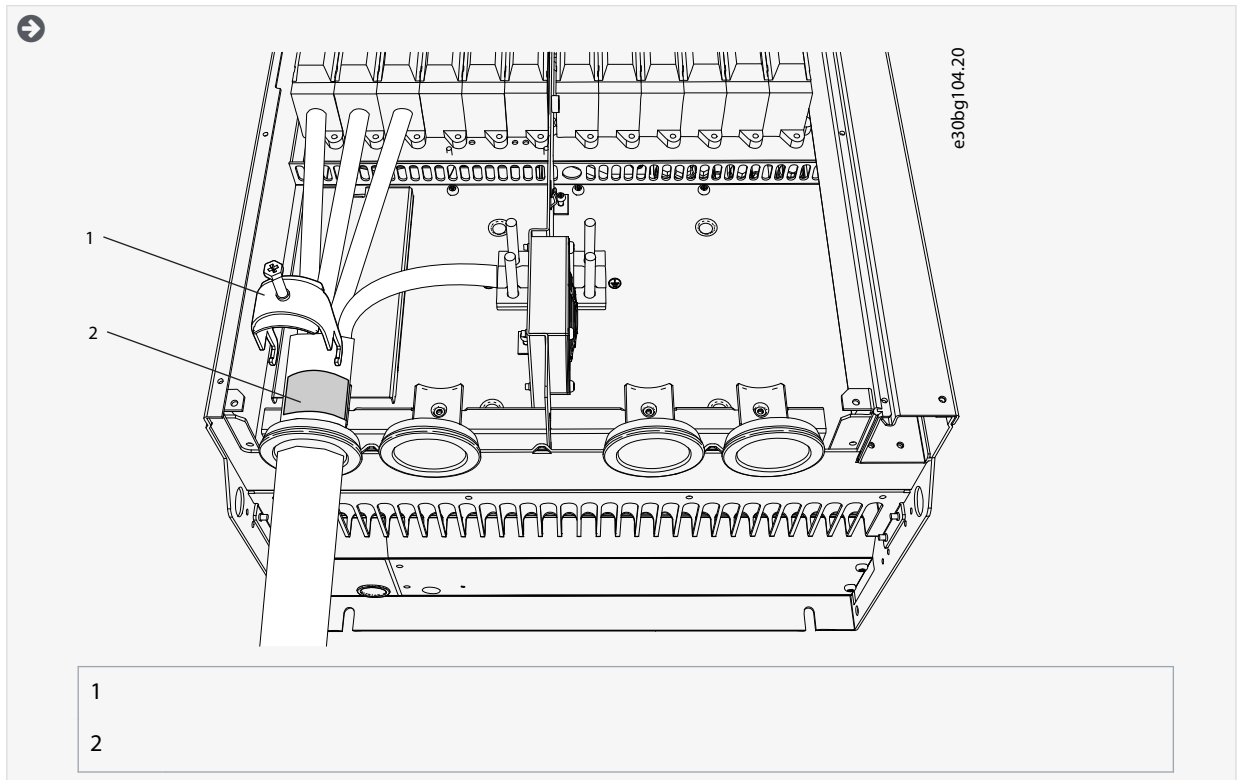
4.

[12.6](#)

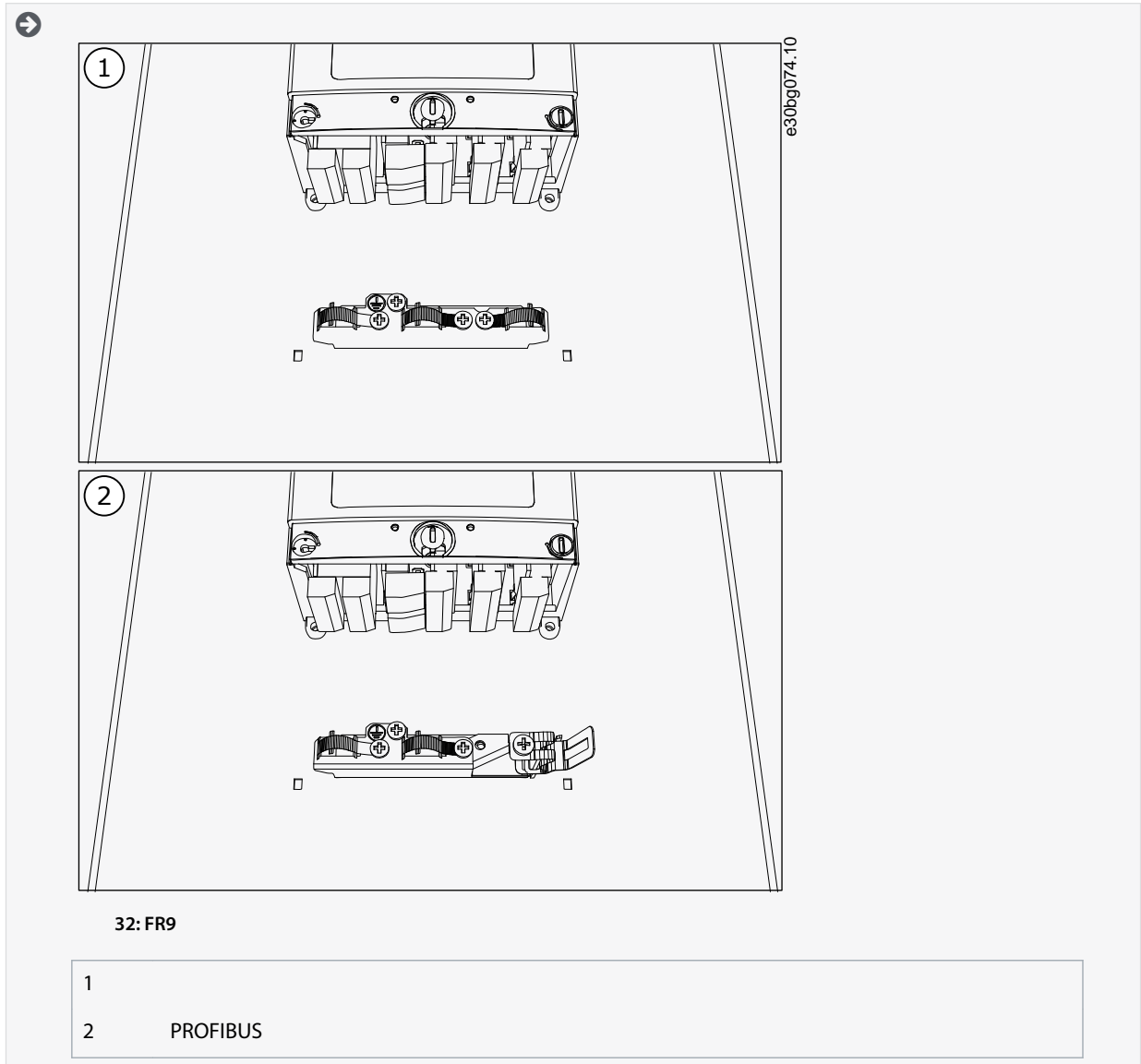
- 가

5.

360°



6. M4x16



7.

.AC

[12.5](#)

6.5.6

, FR10

UL

가

VACON®

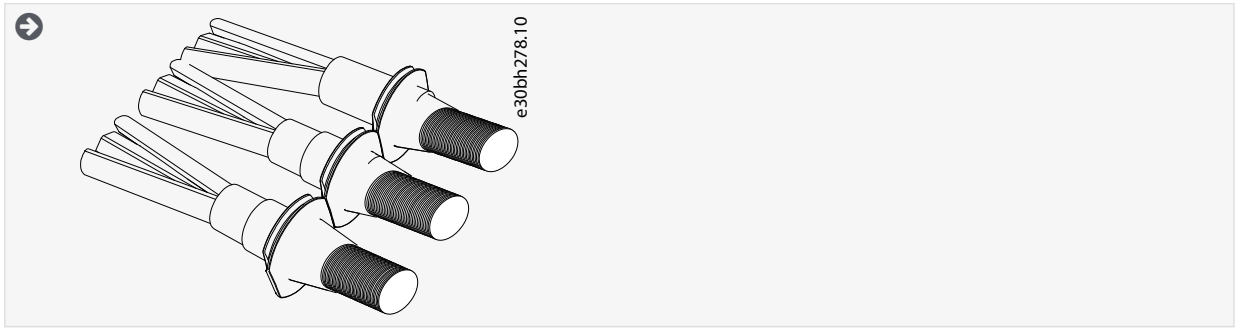
[6.1.2 UL](#)

[.8.7.8.2](#)

[6.4.7 FR10 Standalone](#)

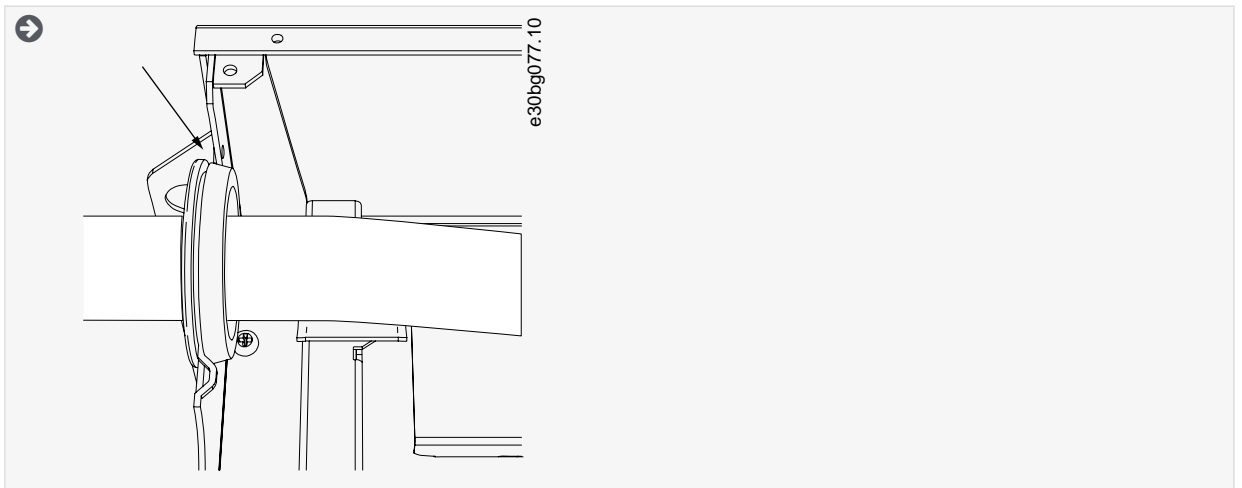
1.





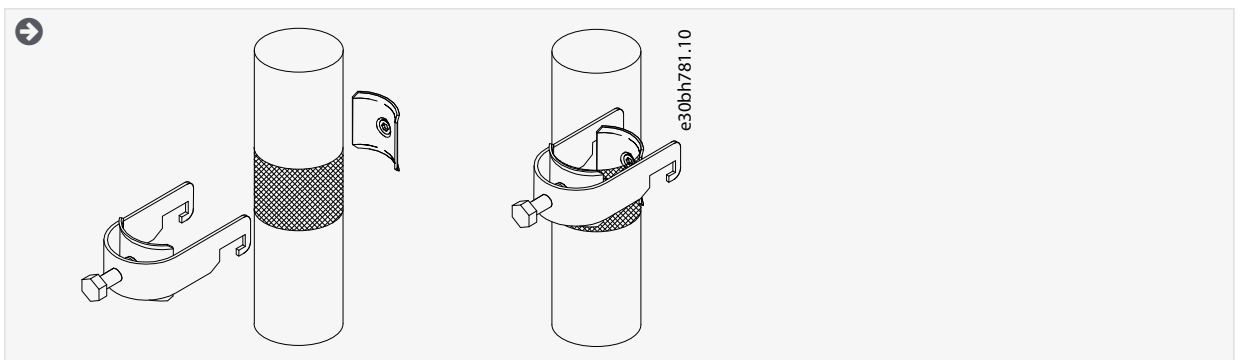
2.

- IP54 (UL 12)
- 가



3.

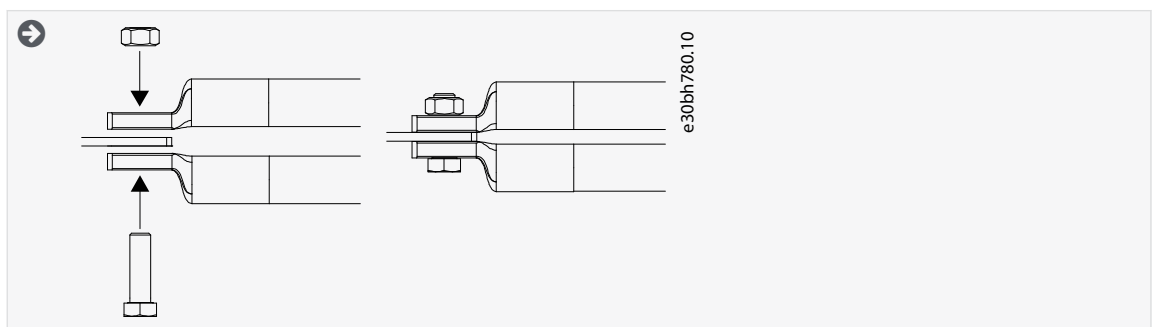
360°



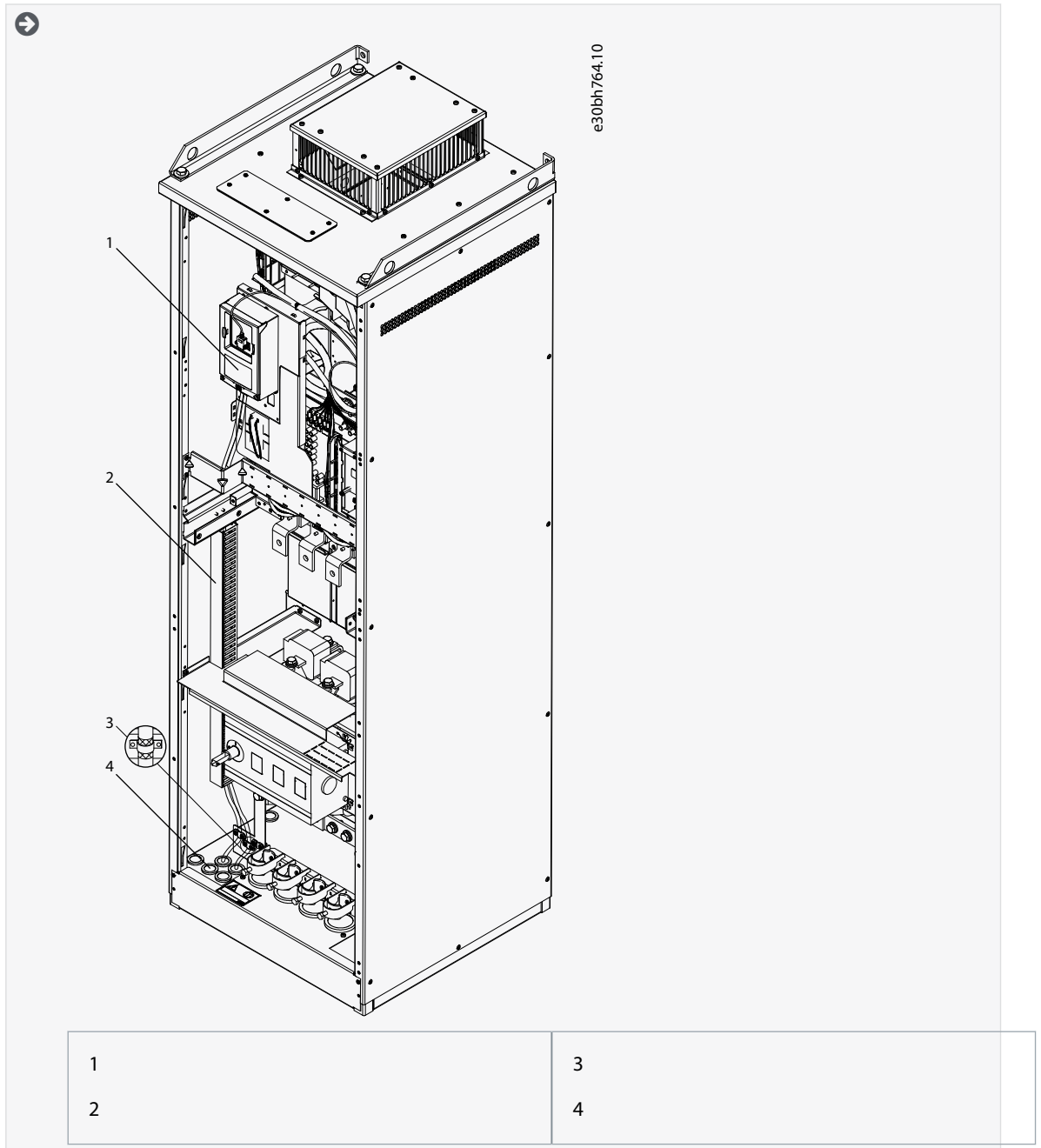
4.

[.12.6](#)

a.

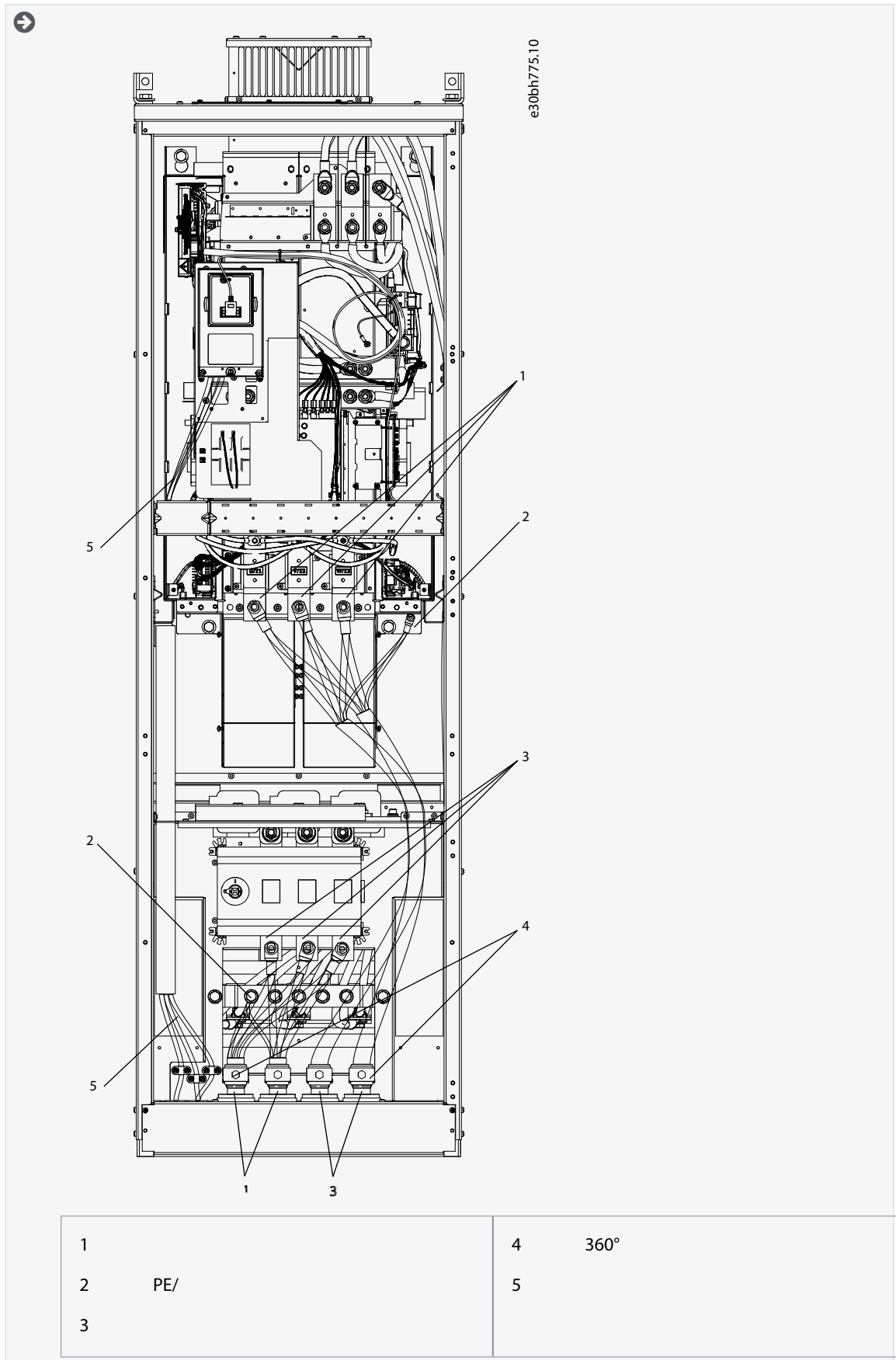


b.

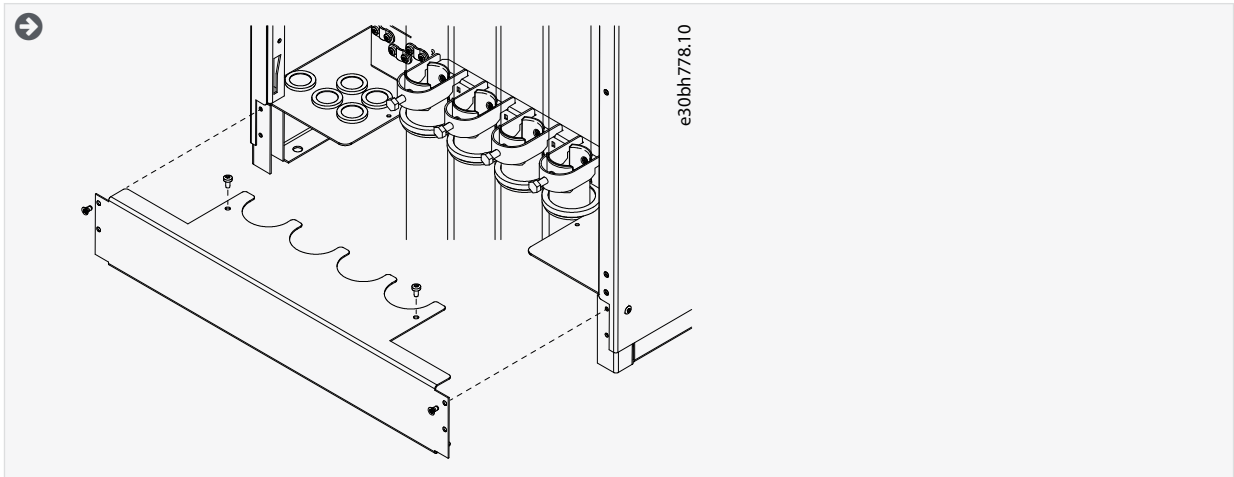


c.

가



5.



6. [12.5](#) . AC

7.

6.5.7 , FR11

UL

가

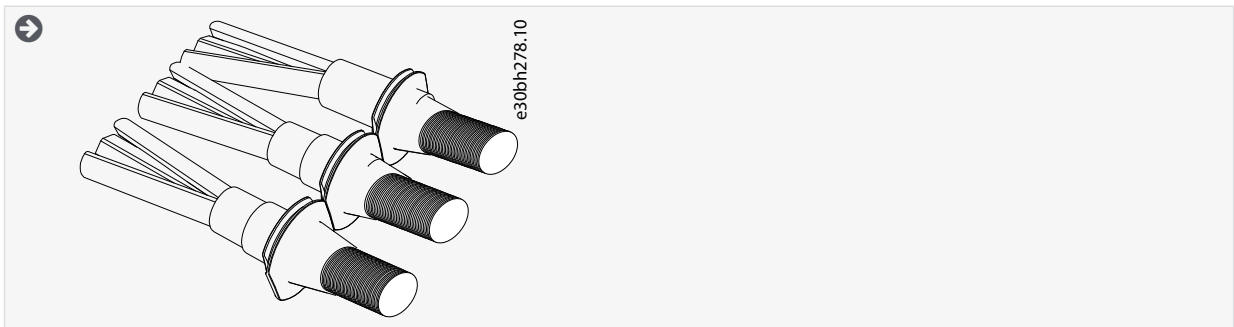
VACON®

[6.1.2 UL](#)

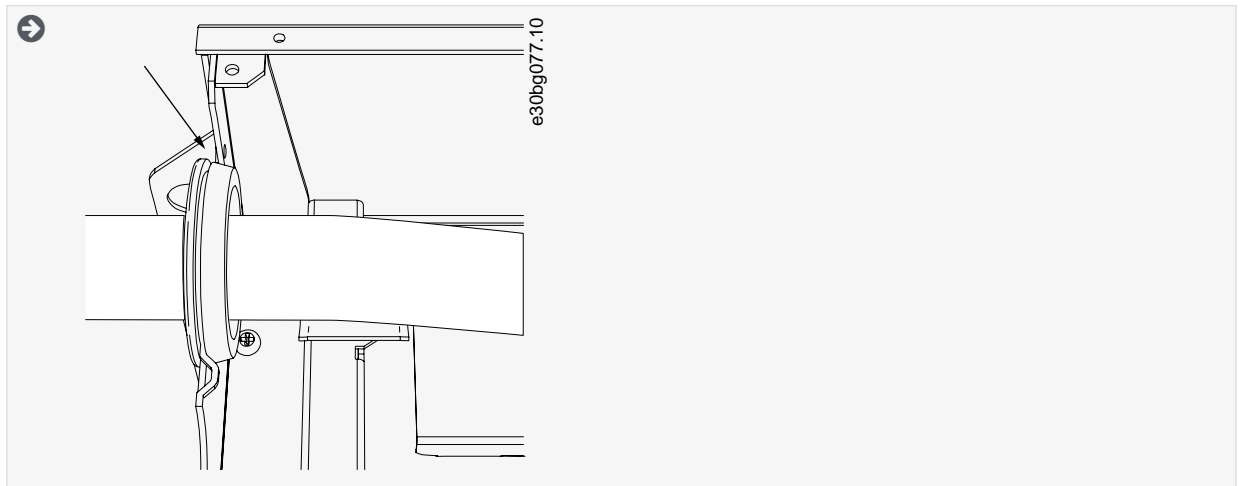
[.8.7.8.2](#)

[6.4.8 FR11](#)

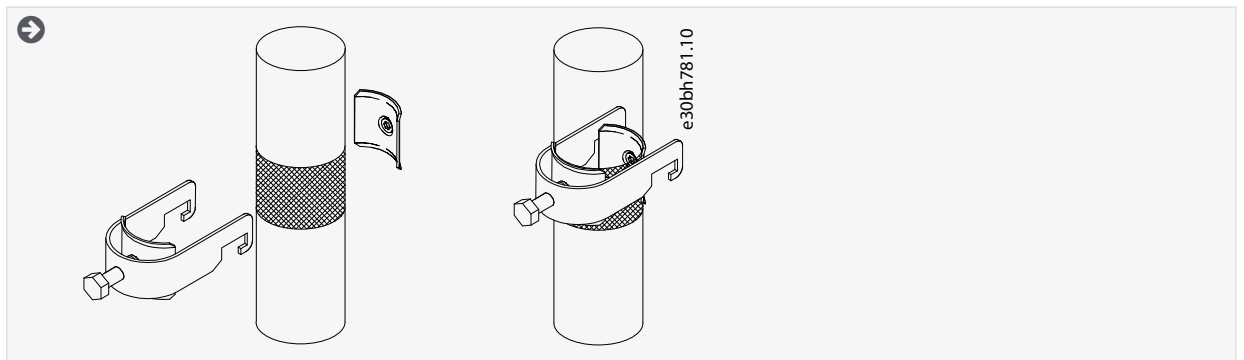
1.



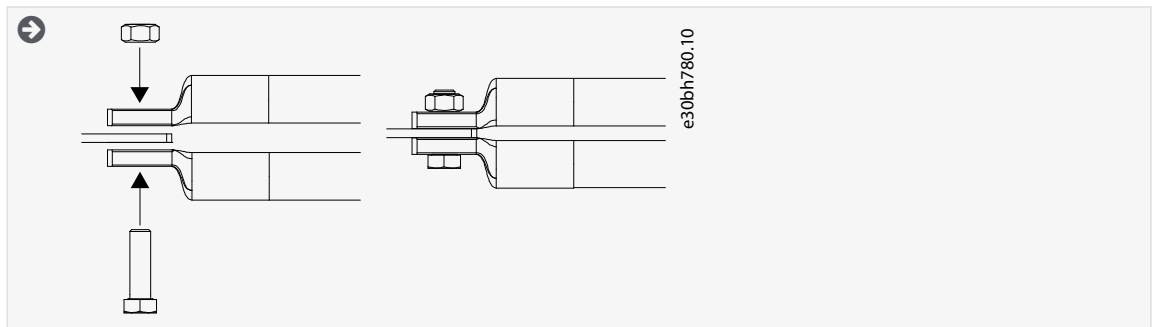
2.



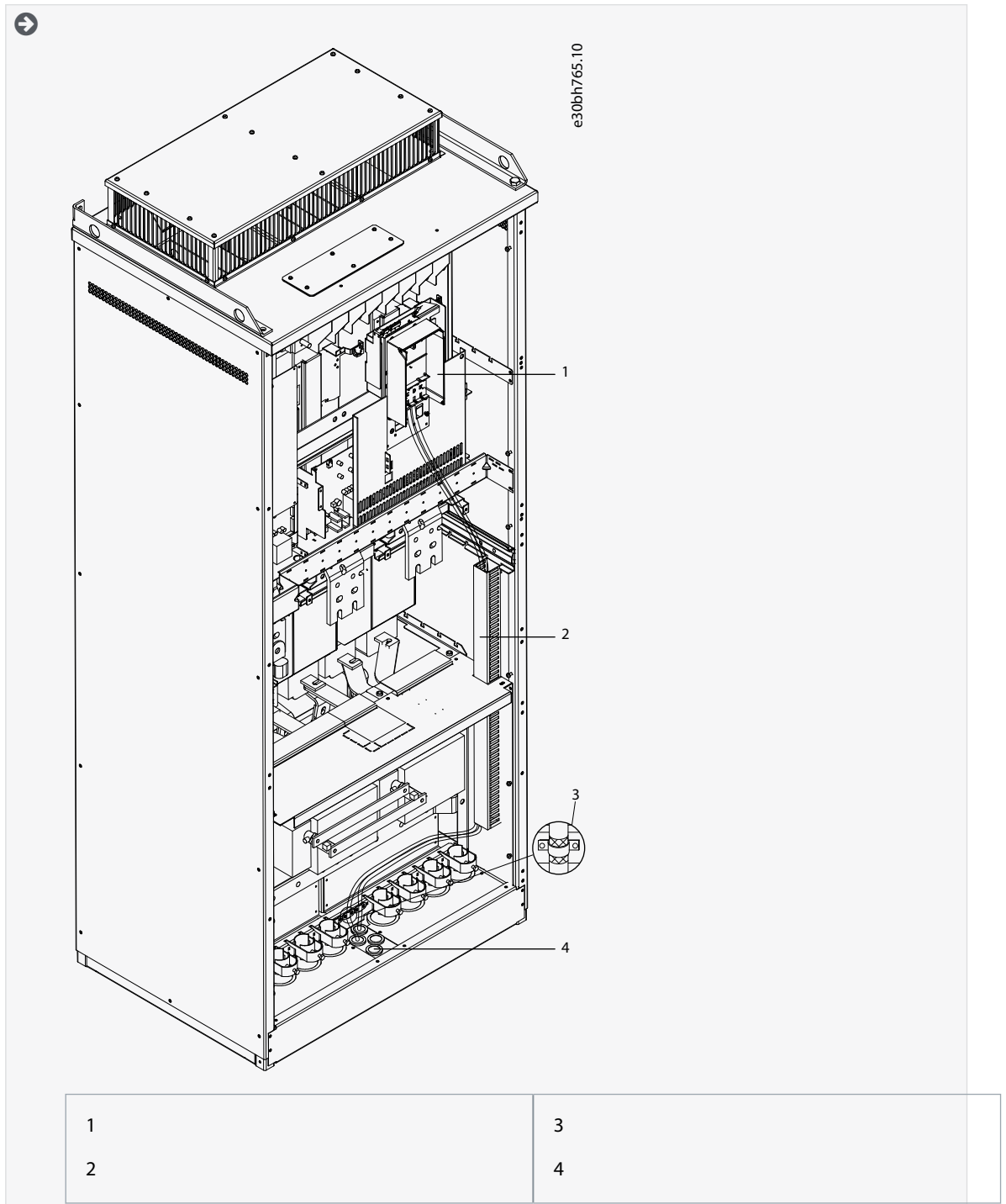
3. 360°



4. [12.6](#)  
a.

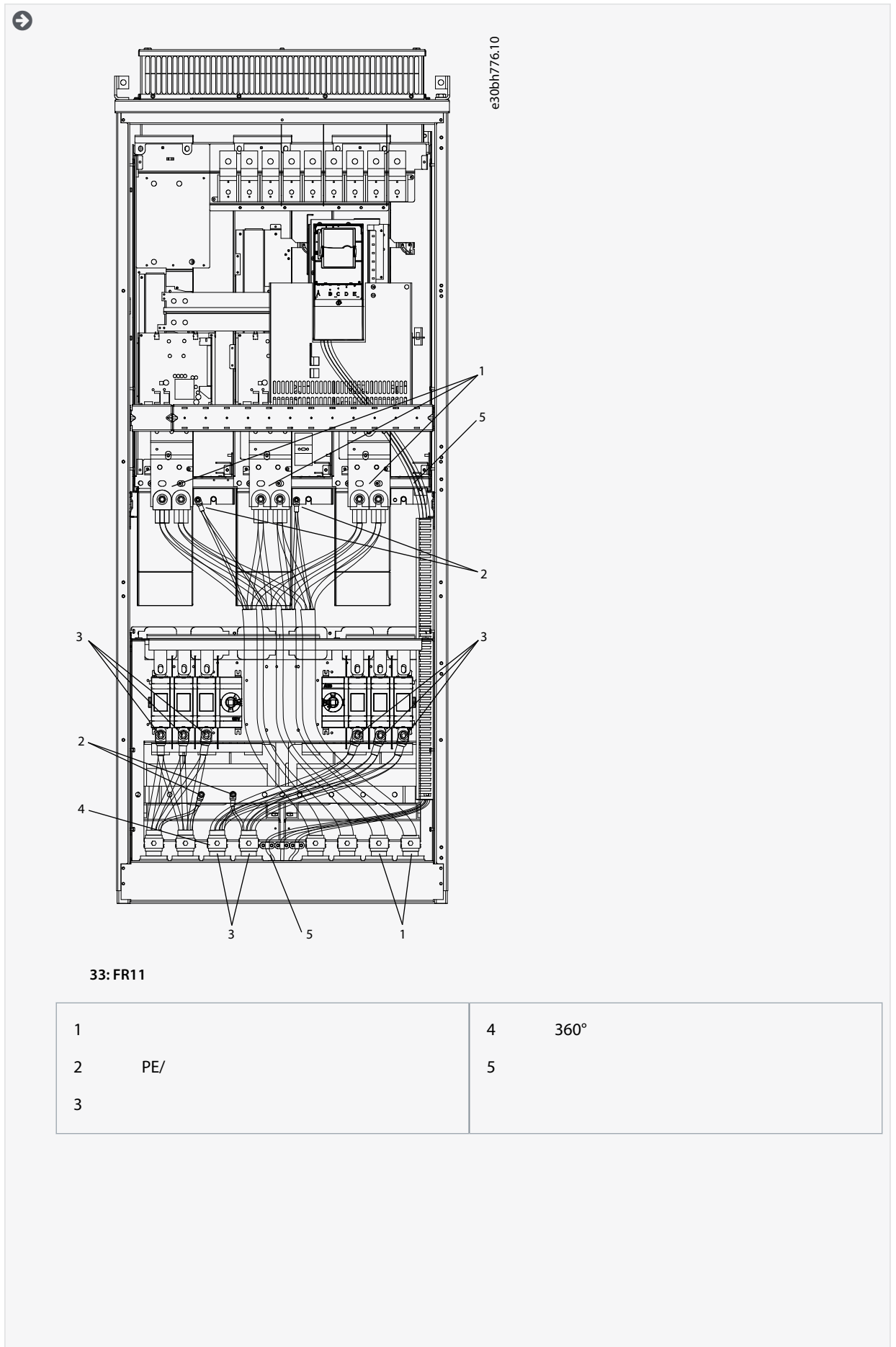


b.



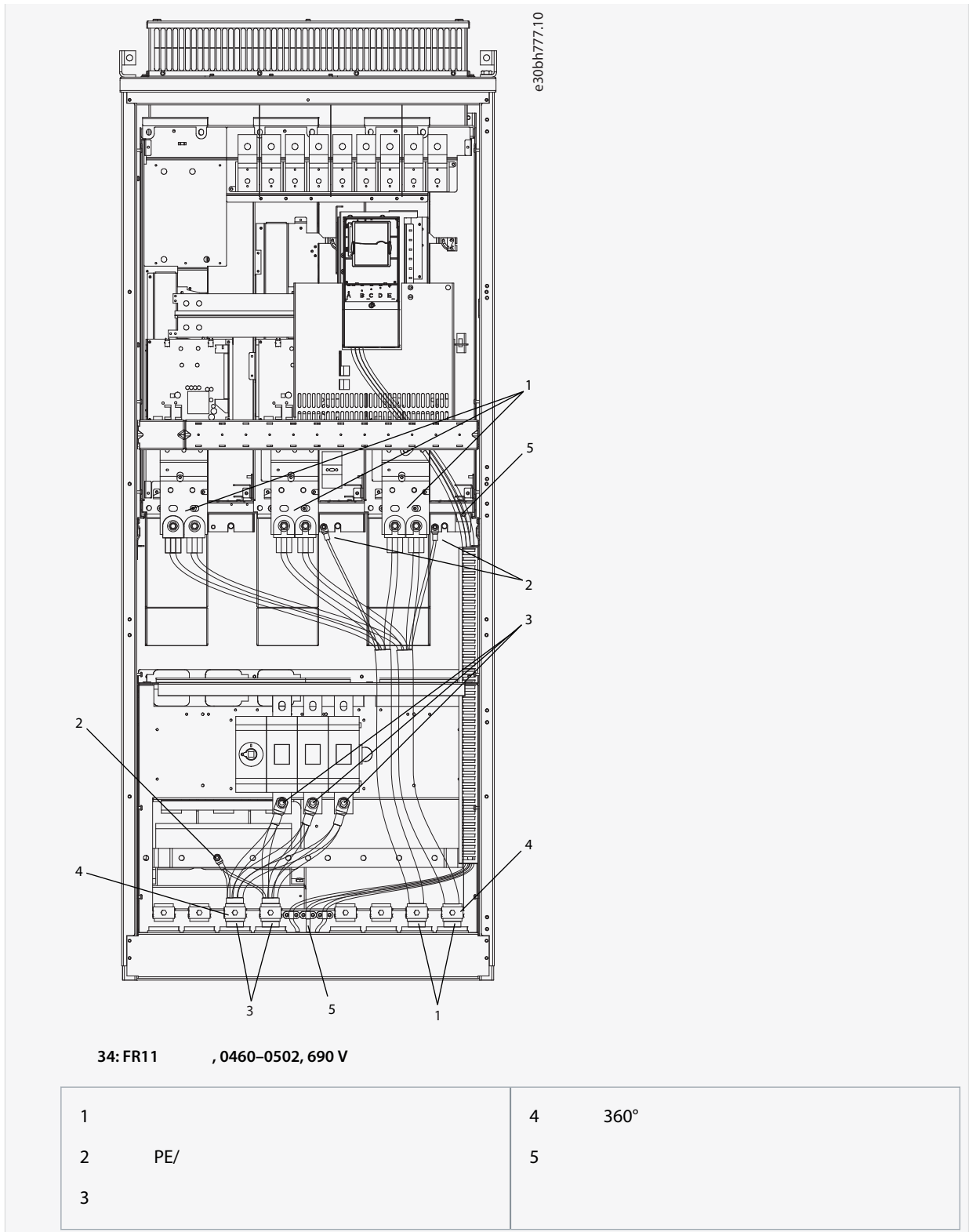
c.

가



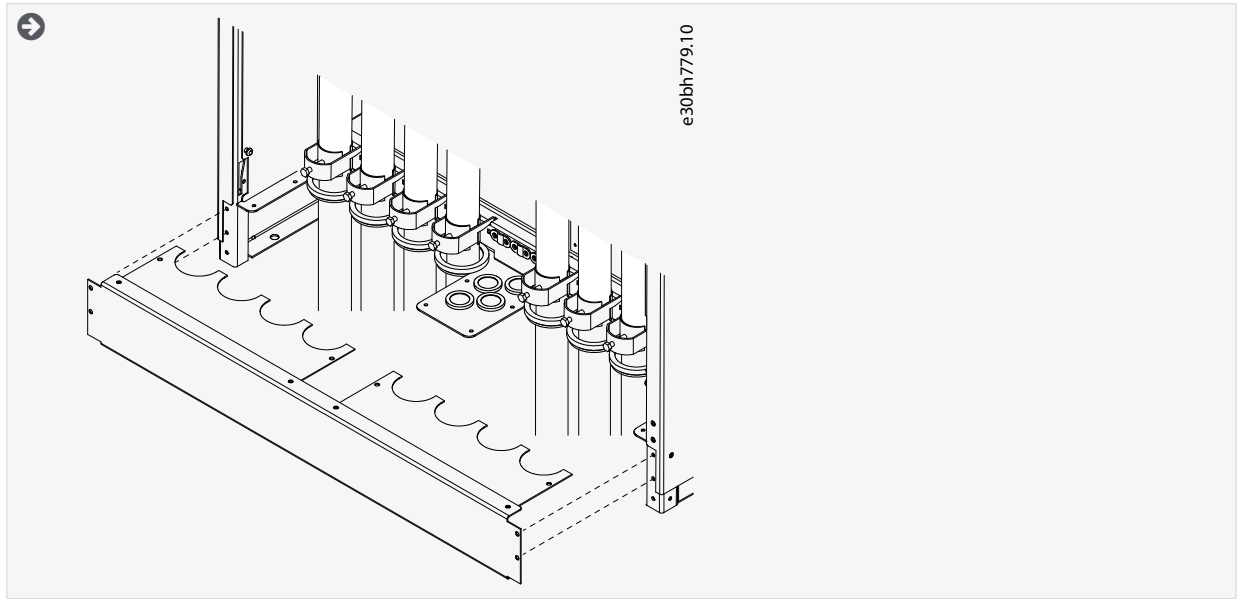
33: FR11

1		4	360°
2	PE/	5	
3			



5.





6. [12.5](#) . AC

7.

6.6 IT

- [6.6.1 IT AC, FR4-FR6](#)
- [6.6.2 IT AC, FR7](#)
- [6.6.3 IT AC, FR8-FR11](#)

VACON® AC EMC [3.4](#)

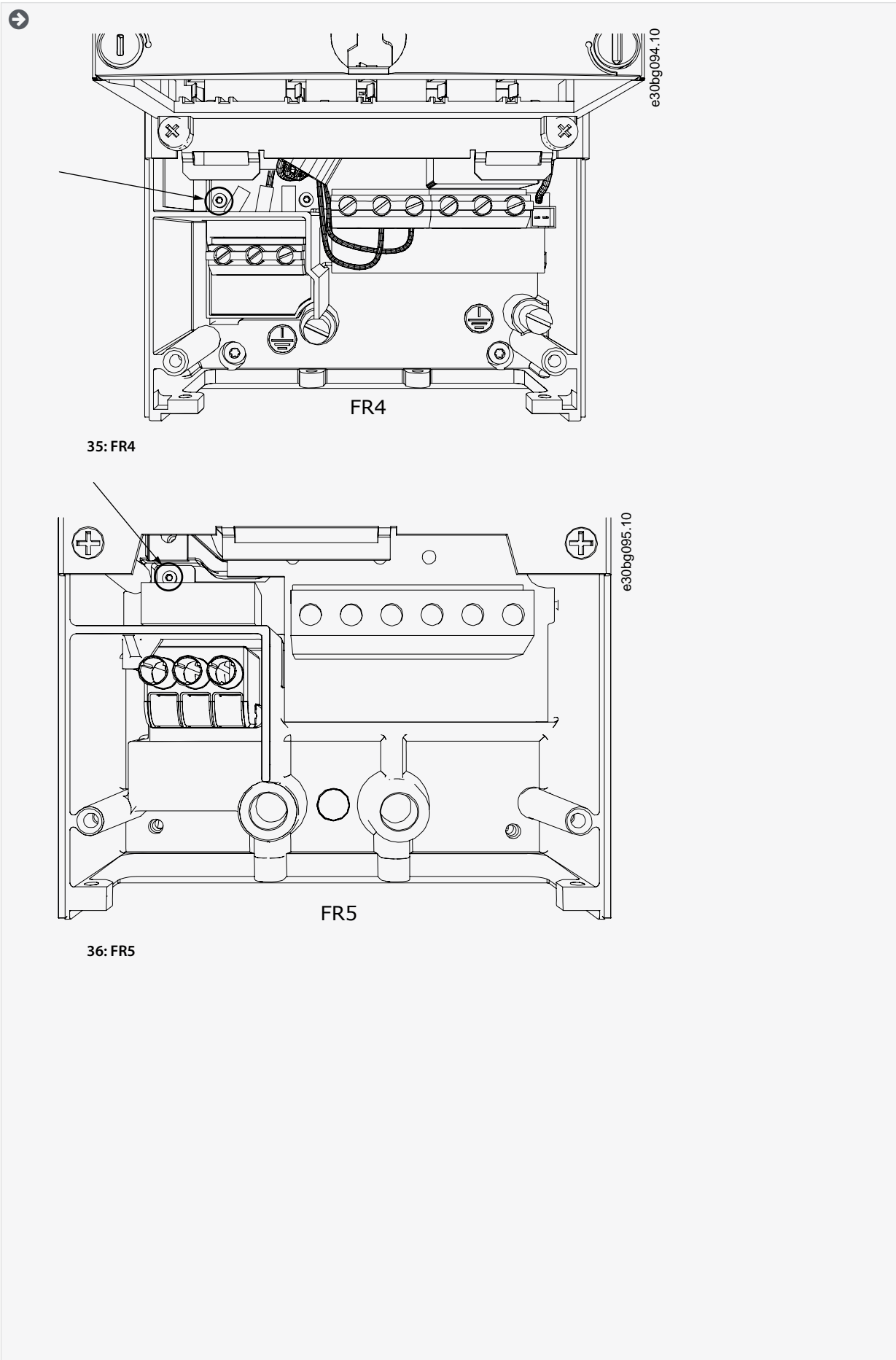
⚠ ⚠	
가	
-	AC

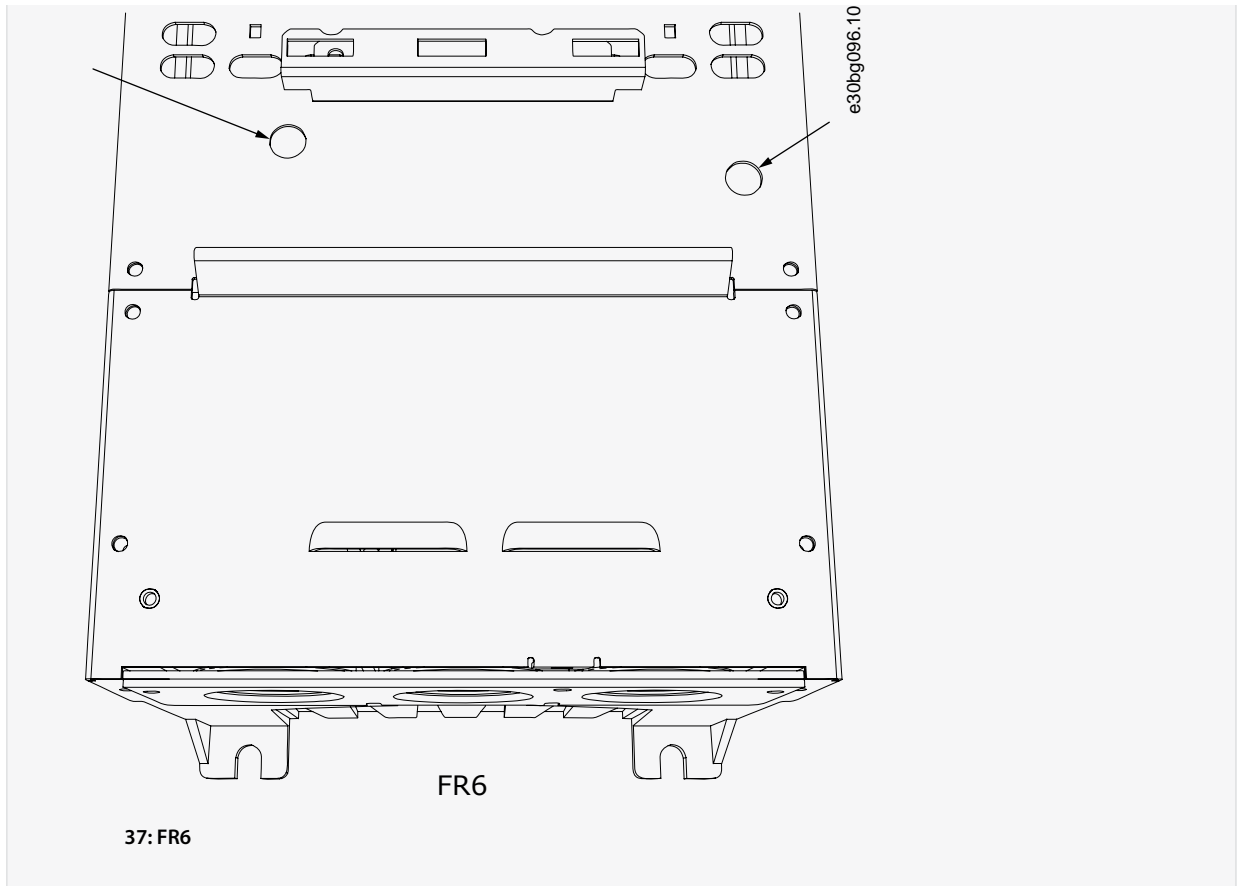
⚠ ⚠	
EMC AC	
AC EMC	EMC
- AC	AC EMC

6.6.1 IT AC, FR4-FR6

- [6.4.1 FR4/FI4](#), [6.4.2 FR5](#), [6.4.3 FR6/FI6](#) AC

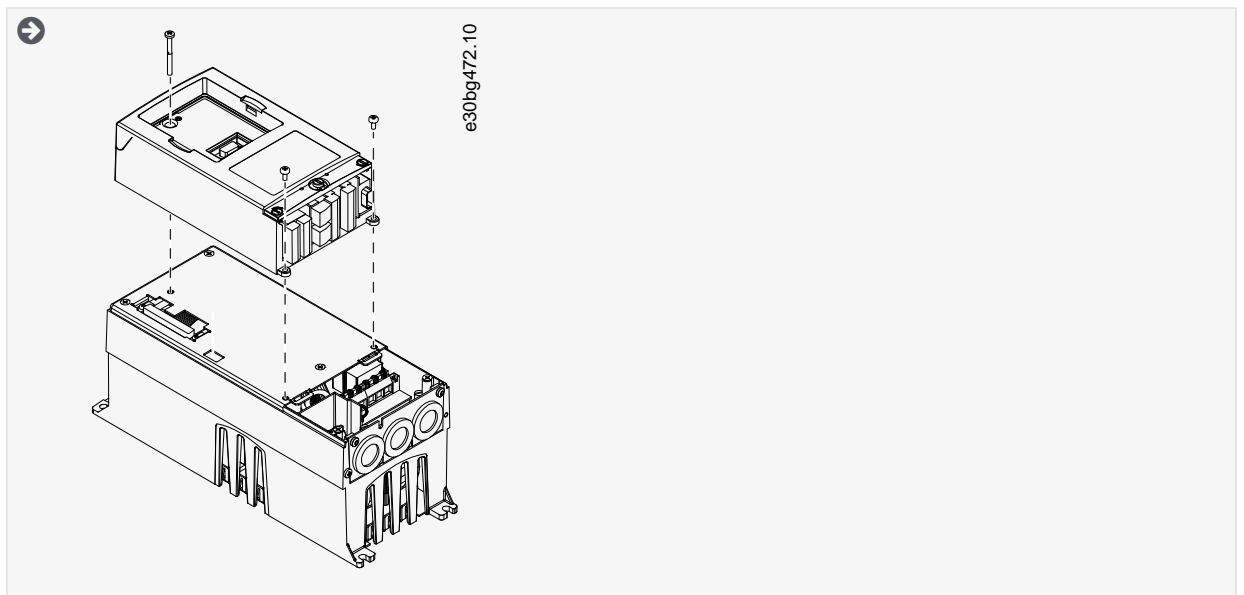
1. EMC



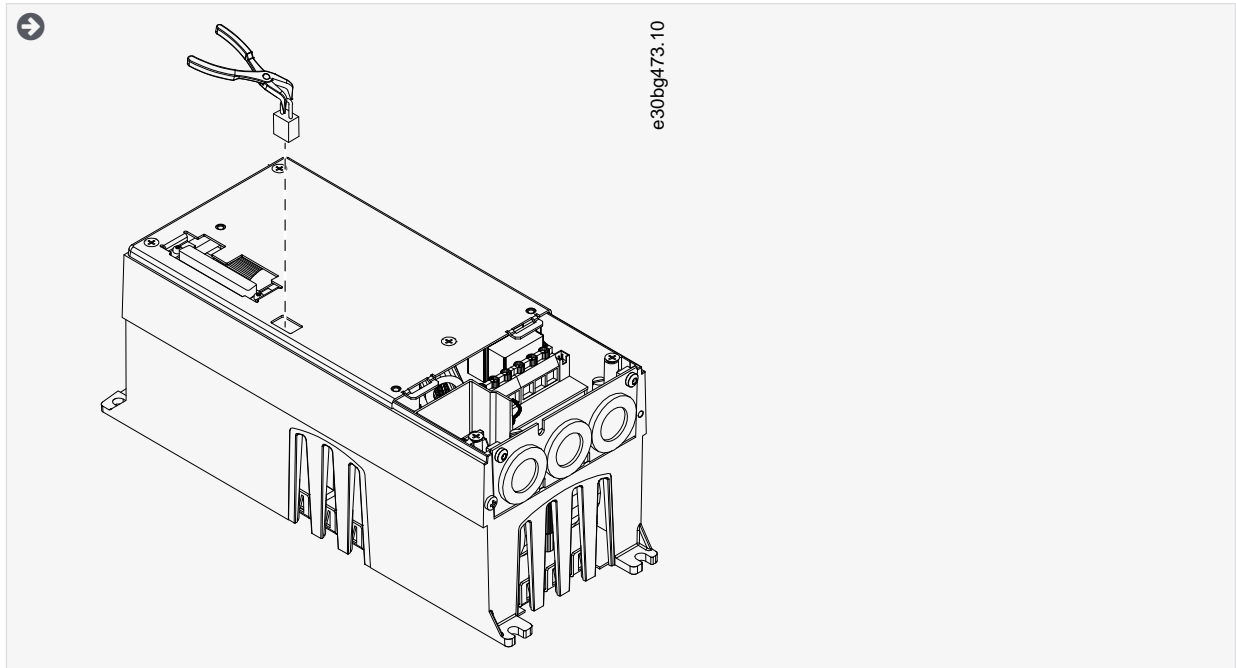


2. FR4

AC		X10-1	가	가
4				



3. X10-1

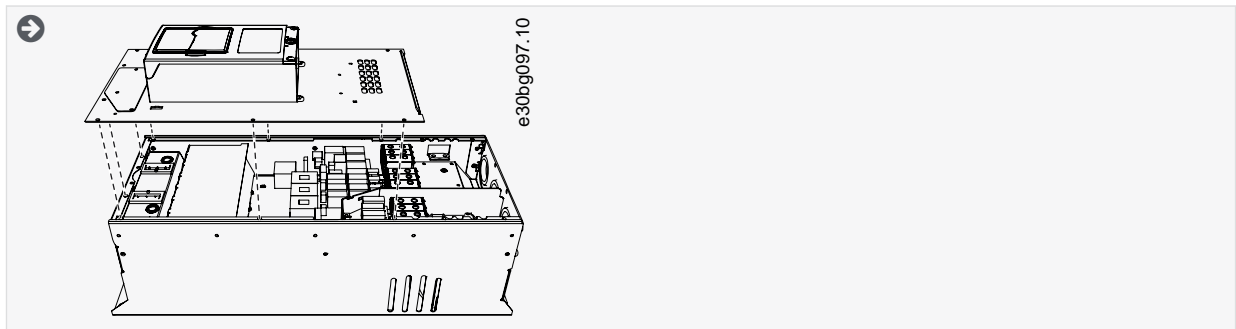


- 4. AC
- 5. "EMC Level modified(EMC )" 12.5 "product modified( )"
- (4.4 )

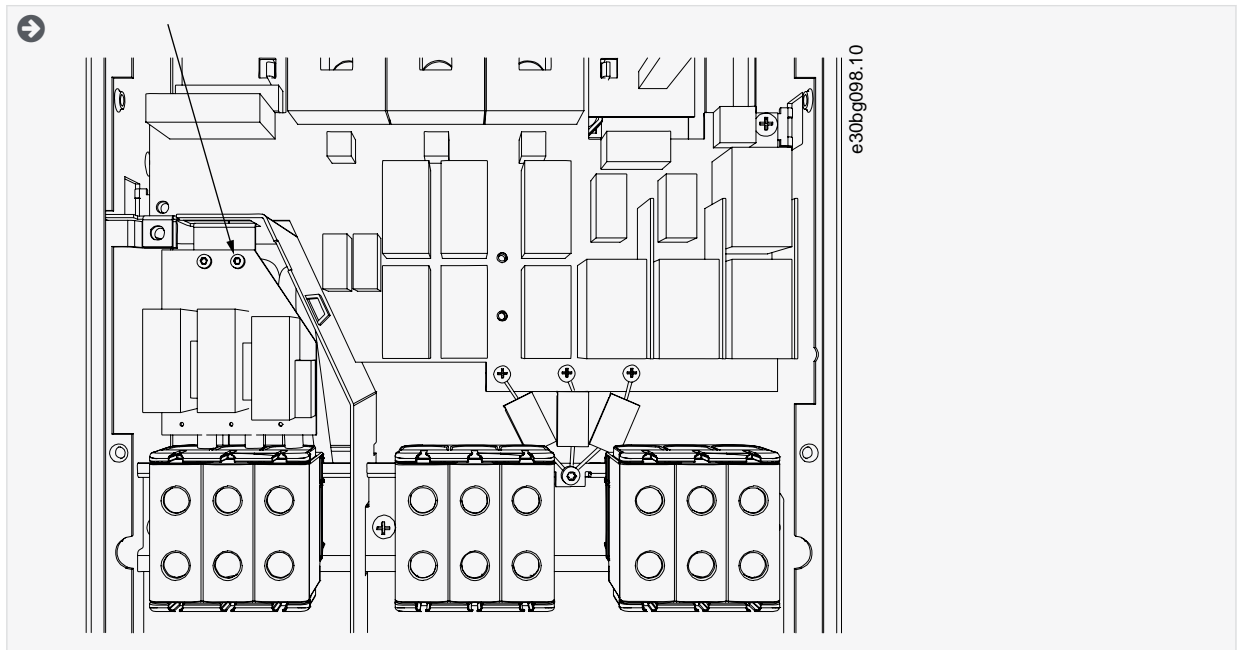
6.6.2 IT AC ,FR7  
AC EMC C4

6.4.4 FR7/FI7 AC

- 1. AC

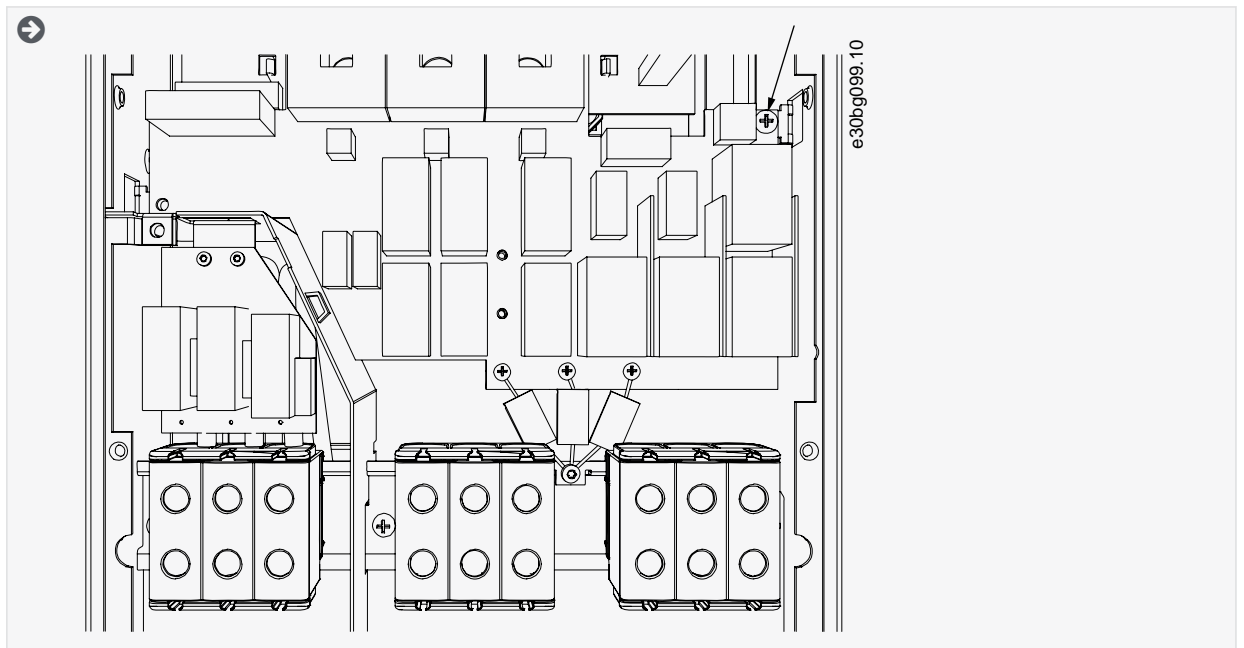


- 2. EMC



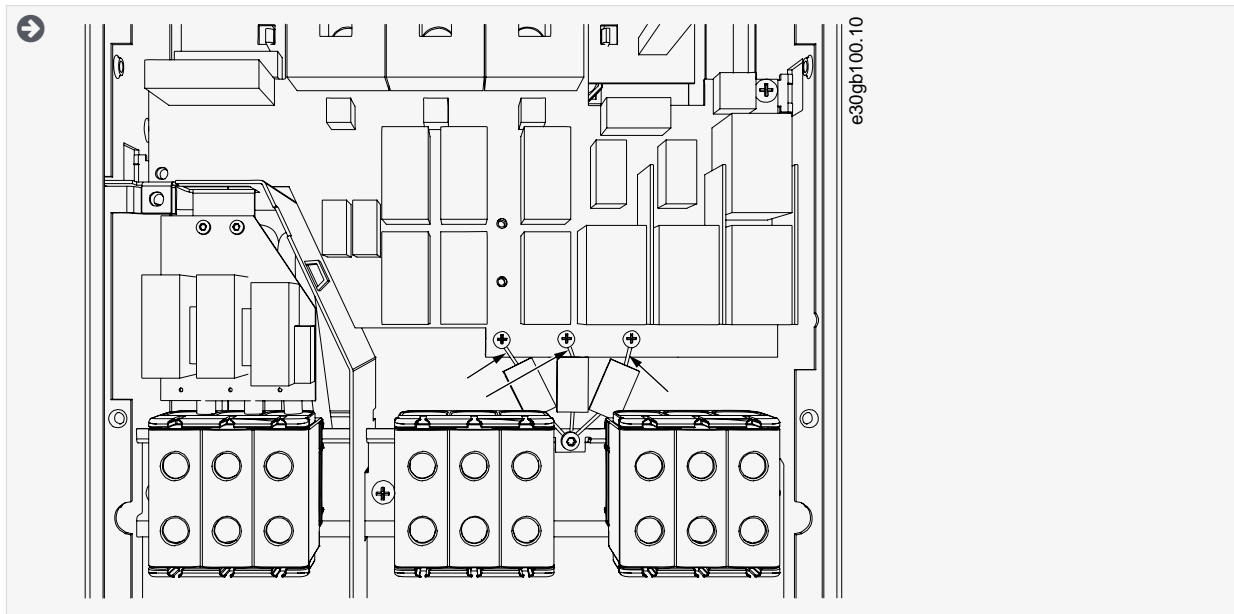
3.

M4

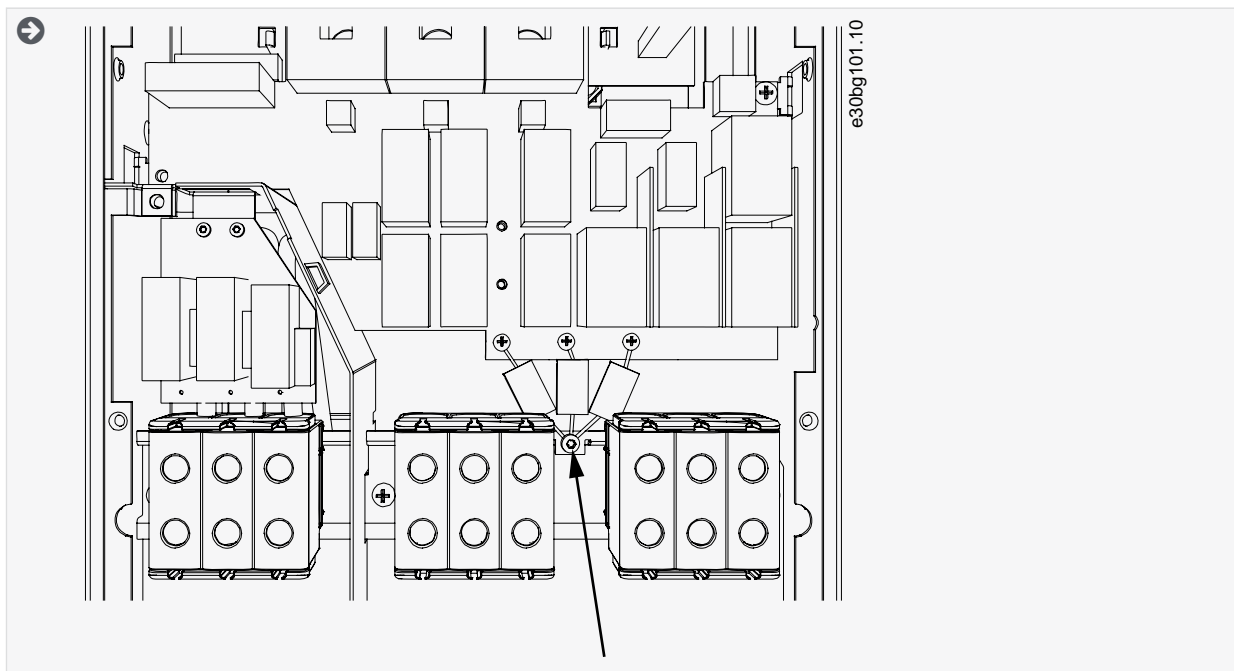


4.

3



5.



6. AC

12.5

7. "The EMC level was changed(EMC )" "product changed( )"  
 (4.4 ).

VACON®	FR7	EMC	C2
--------	-----	-----	----

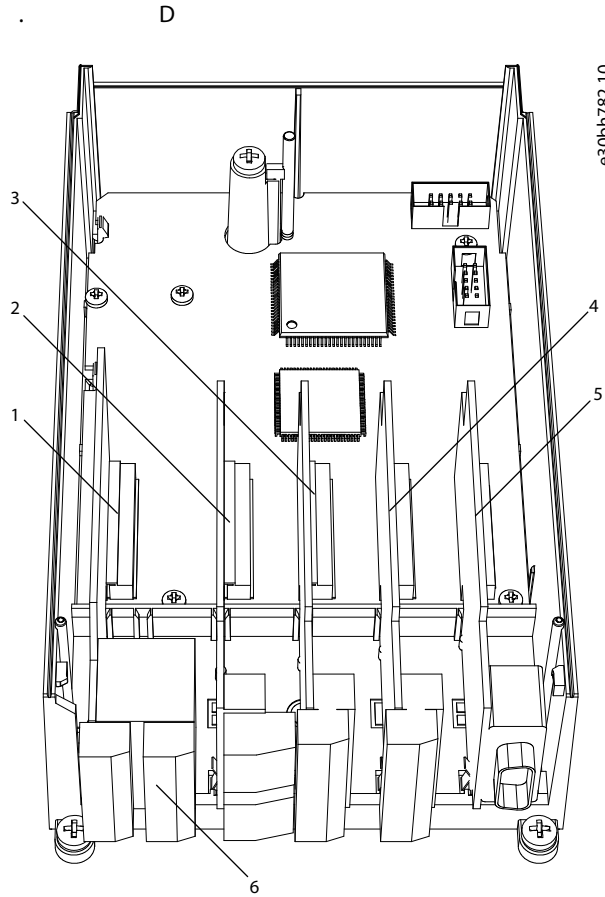
6.6.3 IT AC , FR8–FR11  
 VACON® VACON® NXS/NXP, FR8–FR11 EMC

# 7

## 7.1 NXP

AC

5 (A~E) 가 ( 38)가  
(FR9-FR11).



38:

1	A; OPTA1	4	D;
2	B; OPTA2	5	E;
3	C; OPTA3	6	

AC

가

가

, AC

I/O

VACON® NX I/O

OPTA1

20

가

6

7 가

[7.3.2 OPTA1](#)

VACON® NXP IP00

## 7.2

(+24 V/EXT +24 V)

가 . OPTA1

. +24 V DC ±10%, 1000 mA.

, +24 V

2

(#6 #12)

(

VACON® NX I/O

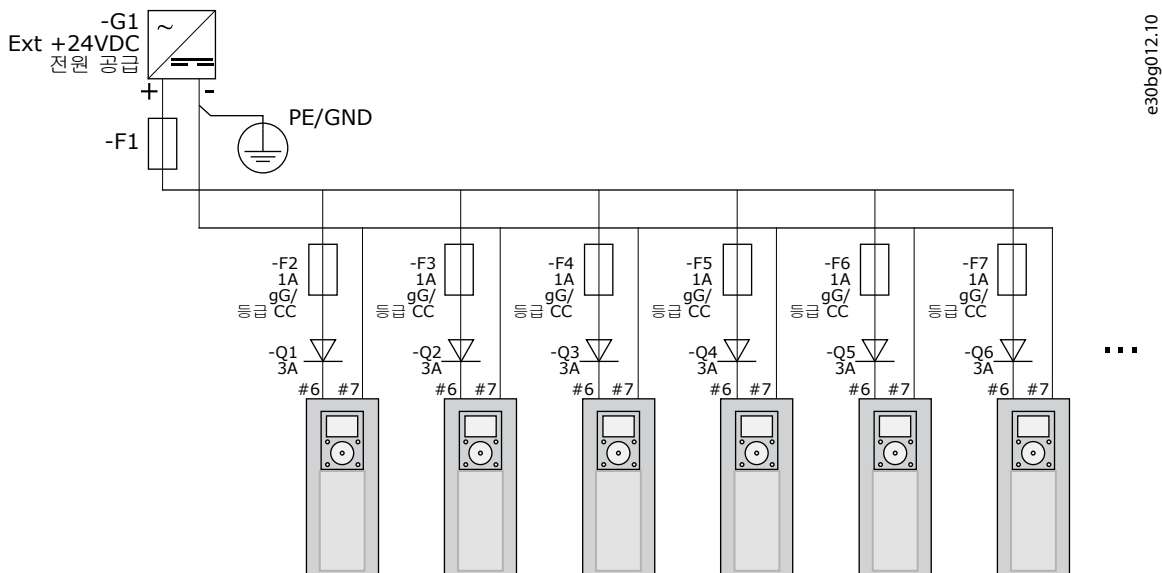
).

( , DC

)

가

AC	24 V DC	#6 ( #12)	가
1A	AC	24 V DC	1 A



39: AC 24 V

24 V	I/O	/	. I/O
------	-----	---	-------

### 7.3

#### 7.3.1

0.5 mm<sup>2</sup> (20 AWG) , 2.5 mm<sup>2</sup> (14 AWG) [10](#) , 1.5 mm<sup>2</sup> (16 AWG)

12:

		(Nm (lb-in.))
	M3	0.5 (4.5)
	M2.6	0.2 (1.8)

#### 7.3.2 OPTA1

I/O

VACON®

[7.3.2.2 OPTA1](#)



표준 I/O 보드

기본 전위차계, 1-10kΩ

단자	신호	설명
1	+10V <sub>기준</sub>	기준 전압
2	AI1+	아날로그 입력, 전압 또는 전류
3	GND/AI1-	아날로그 입력 공통
4	AI2+	아날로그 입력, 전압 또는 전류
5	GND/AI2-	아날로그 입력 공통
6	+24V	24V 보조 전압
7	GND	I/O 접지
8	DIN1	디지털 입력 1
9	DIN2	디지털 입력 2
10	DIN3	디지털 입력 3
11	CMA	DIN1-DIN3용 공통 A
12	+24V	제어 전압 출력
13	GND	I/O 접지
14	DIN4	디지털 입력 4
15	DIN5	디지털 입력 5
16	DIN6	디지털 입력 6
17	CMB	DIN4-DIN6용 공통 B
18	AO1+	아날로그 신호(+출력)
19	AO1-	아날로그 출력 공통
20	DO1	개방 컬렉터 출력

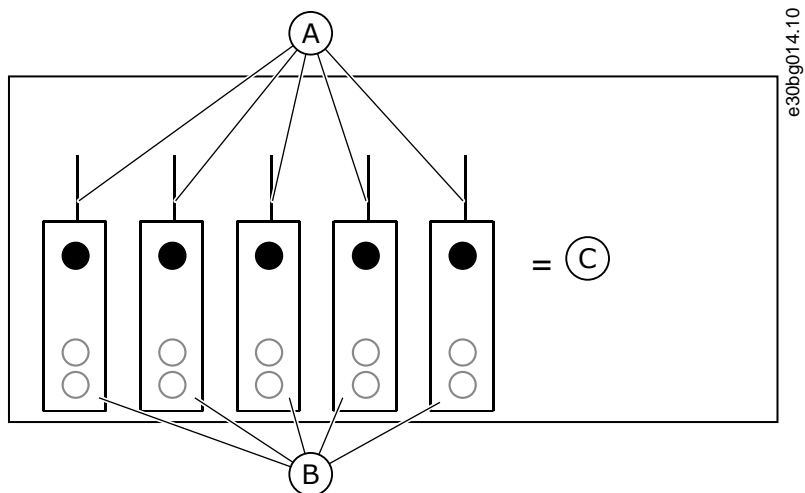
최대 전류 10mA  
 점퍼 블록 X1을 사용하여 V/mA 선택(\*)  
 0...+10V(Ri = 200kΩ)  
 (-10V...+10V 조이스틱 제어, 점퍼를 사용하여 선택)  
 0-20mA(Ri = 250Ω)  
 접지되지 않은 경우의 차동 입력  
 ± 20V 공통 모드 접지 전압 허용  
 점퍼 블록 X1을 사용하여 V/mA 선택(\*)  
 0...+10V(Ri = 200kΩ)  
 (-10V...+10V 조이스틱 제어, 점퍼를 사용하여 선택)  
 0-20mA(Ri = 250Ω)  
 접지되지 않은 경우의 차동 입력  
 ± 20V 공통 모드 접지 전압 허용  
 ±15%, 최대 250mA(모든 보드 합계)  
 150mA(단일 보드)  
 제어 유닛 (및 필드버스) 용도의 외부 전원 백업으로 사용 가능  
 기준 및 제어용 접지  
 Ri = 최소 5 kΩ  
 18-30V = 1  
 디지털 입력을 접지에서 분리할 수 있음(\*)  
 단자 #6과 동일  
 단자 #7과 동일  
 Ri = 최소 5 kΩ  
 18-30V = 1  
 접지나 I/O 단자의 24V 또는 ext.24V 또는 접지에 연결해야 함  
 점퍼 블록 X3을 사용하여 선택(\*)  
 출력 신호 범위: 전류 0(4)-20mA,  
 RL 최대 500 Ω 또는  
 전압 0-10V, RL > 1kΩ  
 점퍼 블록 X6를 사용하여 선택(\*)  
 최대 Uin = 48VDC  
 최대 전류 = 50mA

e30bg013.10

40: OPTA1

\*) [7.3.2.2 OPTA1](#)

NCDrive I/O . An.IN:A.1, An.IN:A.2, DigIN:A.1, DigIN:A.2, DigIN:A.3, Dig-  
 IN:A.4, DigIN:A.5, DigIN:A.6, AnOUT:A.1 DigOUT:A.1.  
 +24 V/EXT+24 V  
 +24 V  
 가 . 가  
 가 +24 V/EXT+24 V 가 250 mA  
 +24 V/EXT+24 V 150 mA +24 V/EXT+24 V  
 +24 V/EXT+24 V 가 , 가가

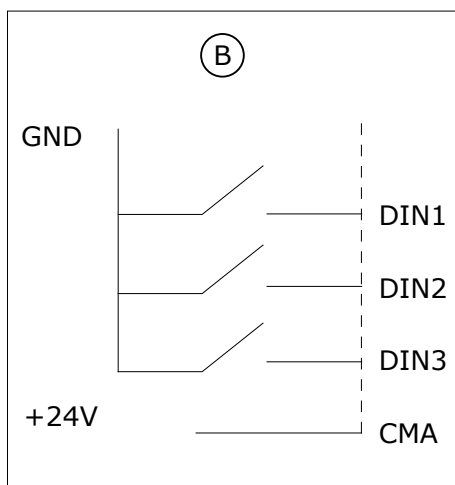
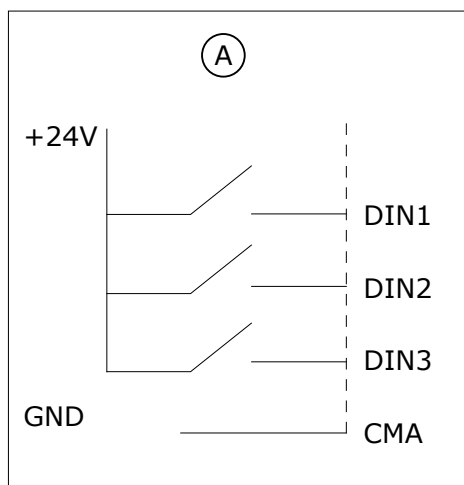


41: +24 V/EXT+24 V

A	150 mA	C	250 mA
B	+24 V		

7.3.2.1

CMA CMB( 11 17)가 +24 V (0V)  
(CMA, CMB) 24 V



42: +/- :

A	+	(+24 V가 )= 가	
B	-	(0V가 )= 가	X3 ' CMA/CMB'

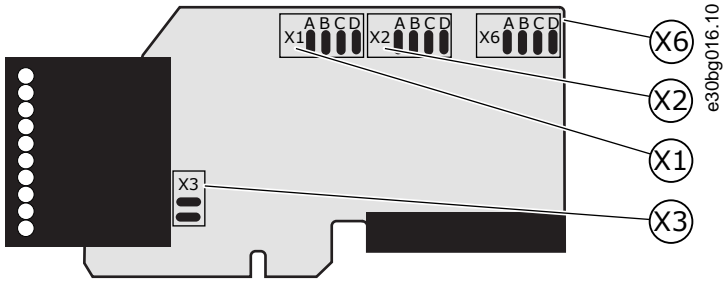
- OPTA1

### 7.3.2.2 OPTA1

AC

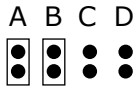
OPTA1

A1	M7	4	. X1, X2, X3	X6.	. AI/AO	8	2 가	..
<u>43</u>	가							



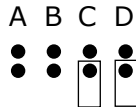
43: OPTA1

점퍼 블록 **X1:**  
**AI1** 모드

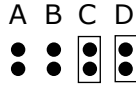


AI1 모드: 0...20mA; 전류 입력

AI1 모드: 전압 입력; 0...10V

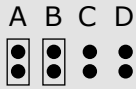


AI1 모드: 전압 입력; 0...10V  
차동

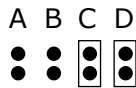


AI1 모드: 전압 입력; -0...10V

점퍼 블록 **X6:**  
**AO1** 모드



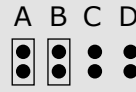
AO1 모드: 0...20mA; 전류 출력



AO1 모드: 전압 출력; 0...10V

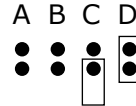
44: OPTA1

점퍼 블록 **X2:**  
**AI2** 모드

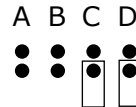


AI2 모드: 0...20mA; 전류 입력

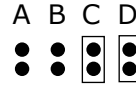
AI2 모드: 전압 입력; 0...10V



AI2 모드: 전압 입력; 0...10V

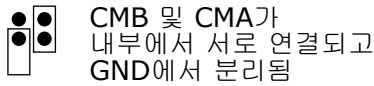
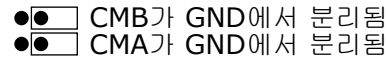
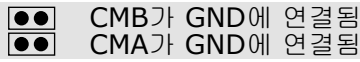


AI2 모드: 전압 입력; 0...10V  
차동



AI2 모드: 전압 입력; -10...10V

점퍼 블록 **X3:**  
**CMA** 및 **CMB** 접지



= 공장 기본값

e30bg017.10

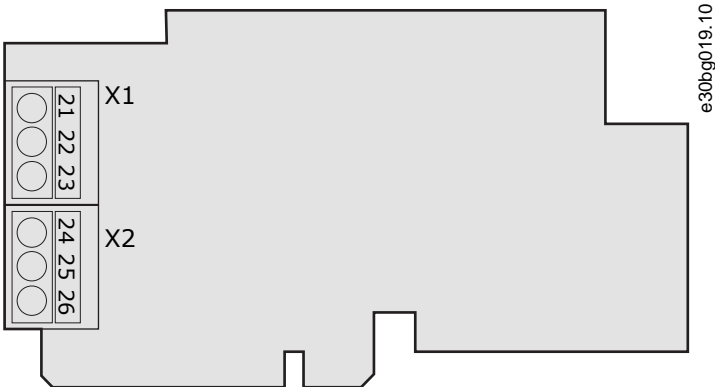
### 7.3.3 OPTA2 OPTA3

OPTA2			
21	RO1/1	릴레이 출력 1 Цифр.выход: B.1 *)	스위칭 용량 • 24VDC/8A • 250VAC/8A • 125VDC/0.4A 최소 스위칭 부하 • 5V/10mA
22	RO1/2		
23	RO1/3		
24	RO2/1	릴레이 출력 2 Цифр.выход: B.2 *)	스위칭 용량 • 24VDC/8A • 250VAC/8A • 125VDC/0.4A 최소 스위칭 부하 • 5V/10mA
25	RO2/2		
26	RO2/3		
OPTA3			
21	RO1/1	릴레이 출력 1 Цифр.выход: B.1 *)	스위칭 용량 • 24VDC/8A • 250VAC/8A • 125VDC/0.4A 최소 스위칭 부하 • 5V/10mA
22	RO1/2		
23	RO1/3		
25	RO2/1	릴레이 출력 2 Цифр.выход: B.2 *)	스위칭 용량 • 24VDC/8A • 250VAC/8A • 125VDC/0.4A 최소 스위칭 부하 • 5V/10mA
26	RO2/2		
28	TI1+	서미스터 입력 Цифр.вход: B.1 *)	
29	TI1-		

e30bg018.10

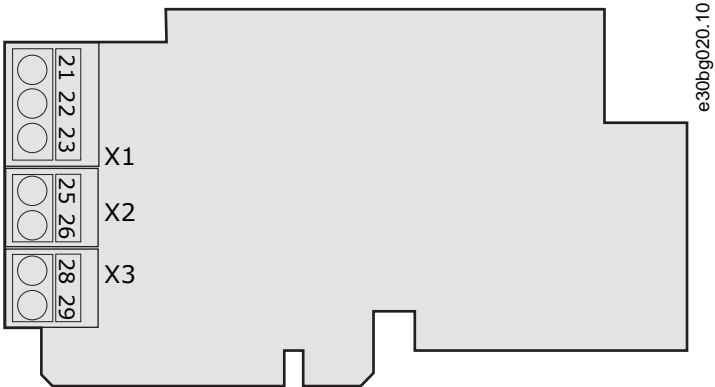
45: OPTA2 OPTA3

\*) NCDrive



e30bg019.10

46: OPTA2



e30bg020.10

47: OPTA3

## 7.4

7.5

. GND

I/O

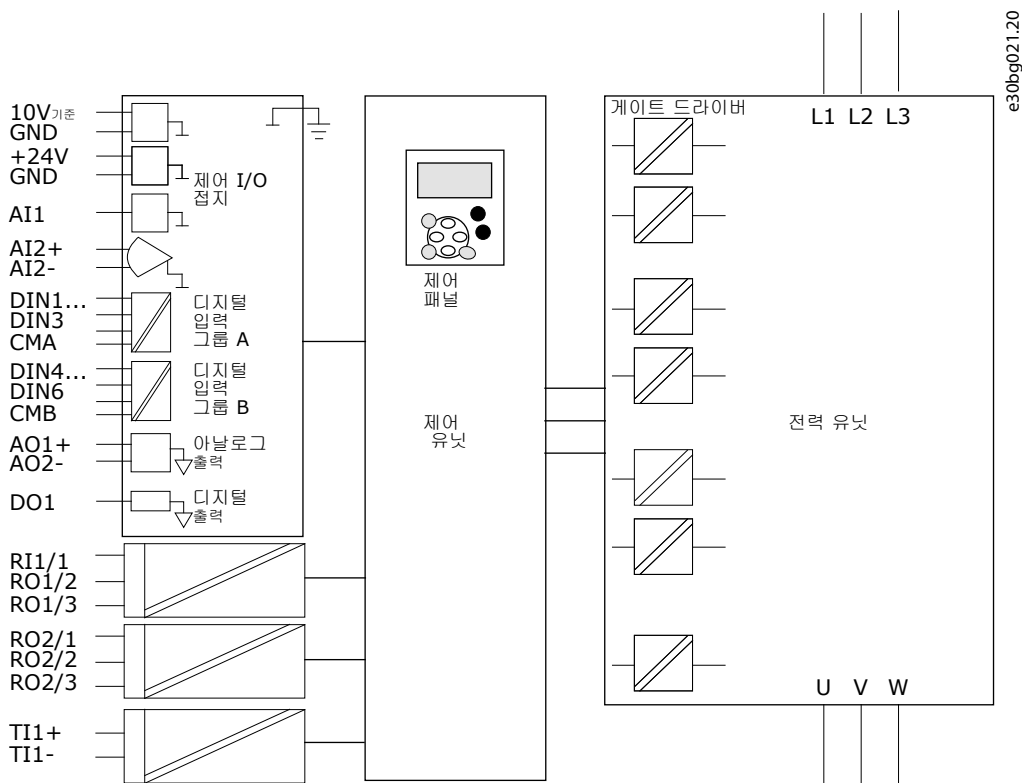
48

I/O

I/O

(PELV).

300 VAC (EN-50178)



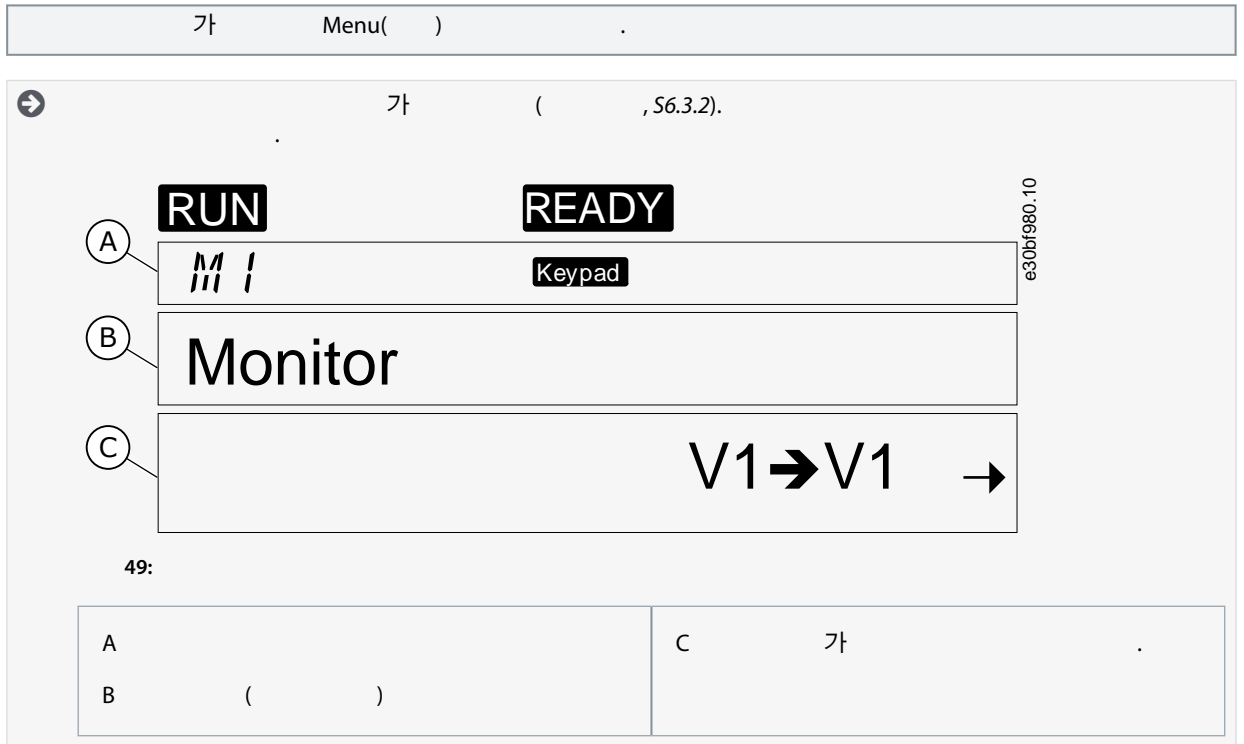
48:

## 8

### 8.1

AC

1. Browser( )
2. 가 Menu( )



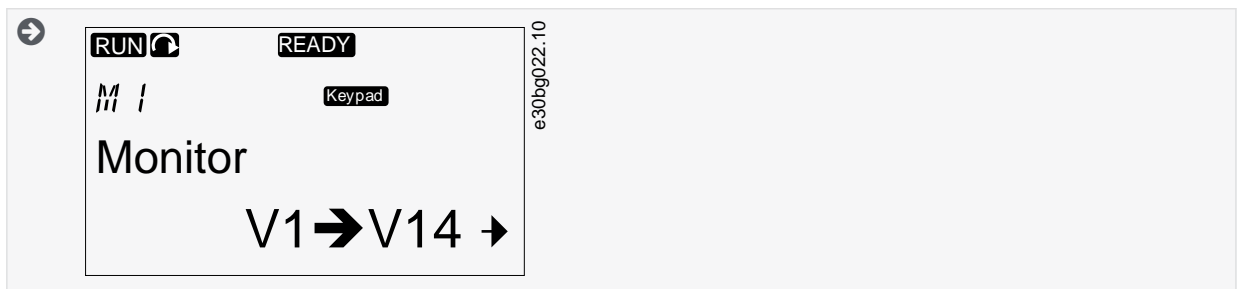
### 8.2 Monitoring( ) (M1)

Monitoring( )

[8.3.2](#)

[8.3.3](#)

1. Monitoring( ) M1



2. Monitoring( ) Menu( )
3. Browser( )

#### 8.2.1

V#.# 0.3

			ID	
V1.1		Hz	1	
V1.2		Hz	25	
V1.3		rpm	2	rpm
V1.4		A	3	
V1.5		%	4	
V1.6		%	5	
V1.7		V	6	
V1.8	DC	V	7	DC
V1.9		°C	8	
V1.10		%	9	. VACON®
V1.11	1	V/mA	13	AI1 <sup>(1)</sup>
V1.12	2	V/mA	14	AI2 <sup>(1)</sup>
V1.13	DIN 1, 2, 3	-	15	1-3
V1.14	DIN 4, 5, 6	-	16	4-6
V1.15	DO1, RO1, RO2	-	17	1-3
V1.16	I <sub>out</sub>	mA	26	AO1
V1.17	Multimonitoring items( )	-	-	3 / <a href="#">.8.7.6.9</a>

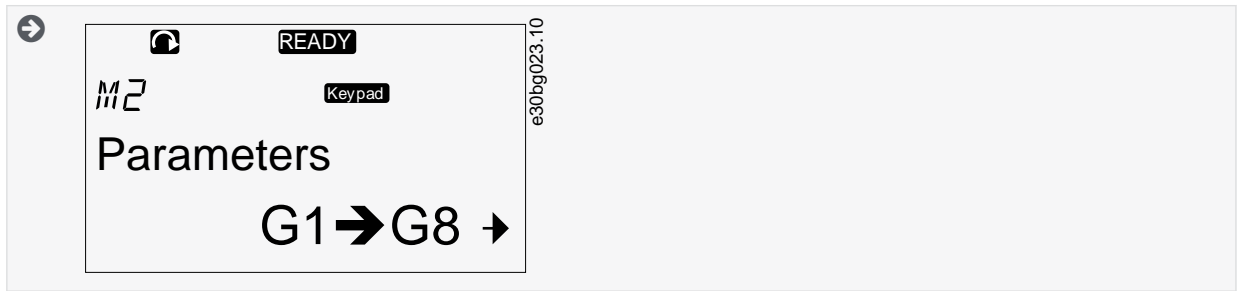
<sup>1</sup> AC +24V ( 가 ) ,  
VACON®

### 8.3 Parameter( ) (M2)

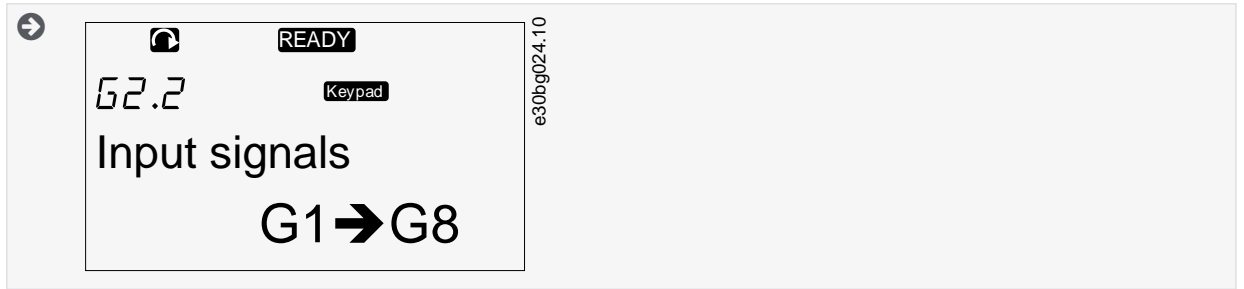
#### 8.3.1

1. Parameter( ) M2가

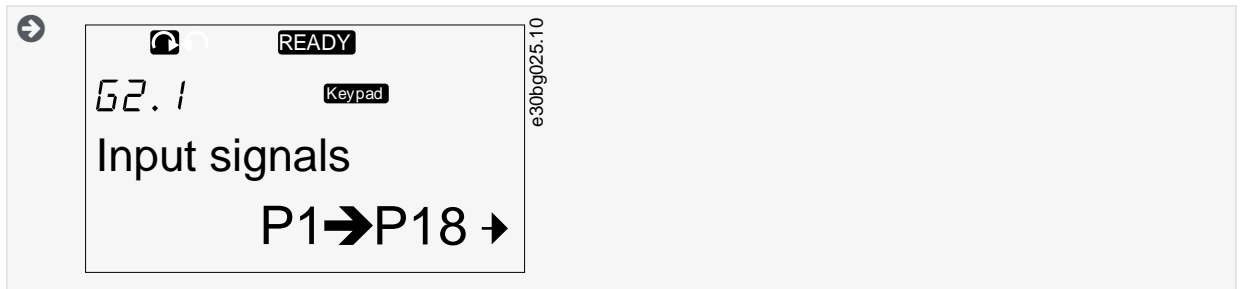




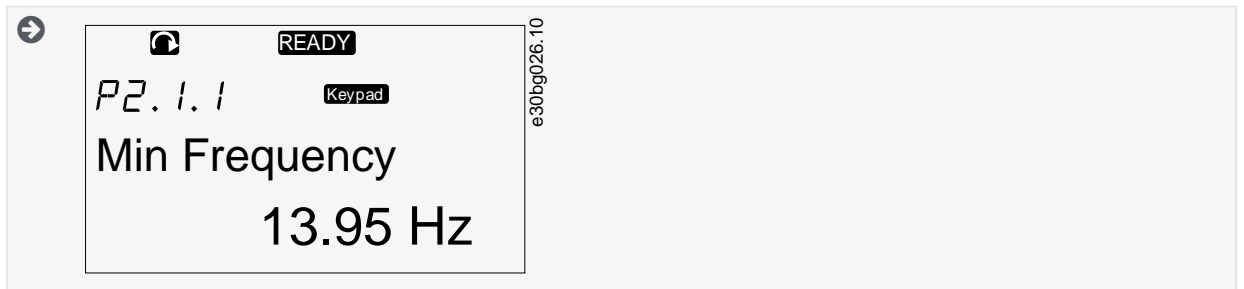
2. Menu( ) Parameter Group( ) (G#) .



3. Browser( ) .



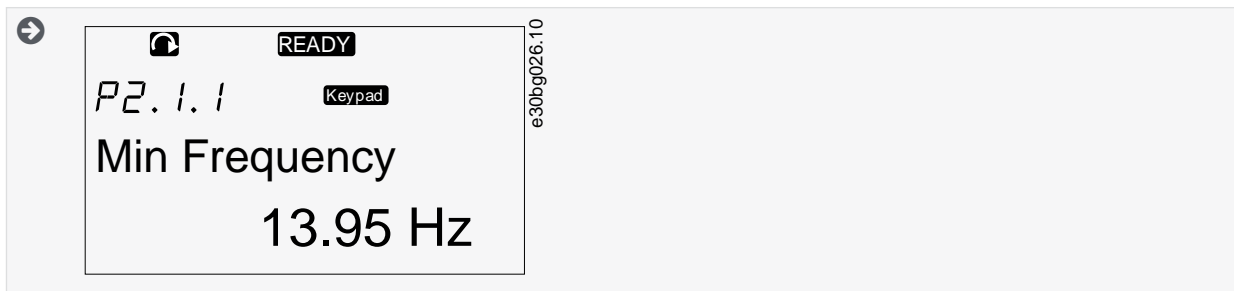
4. Browser( ) (P#) Browser( ) .



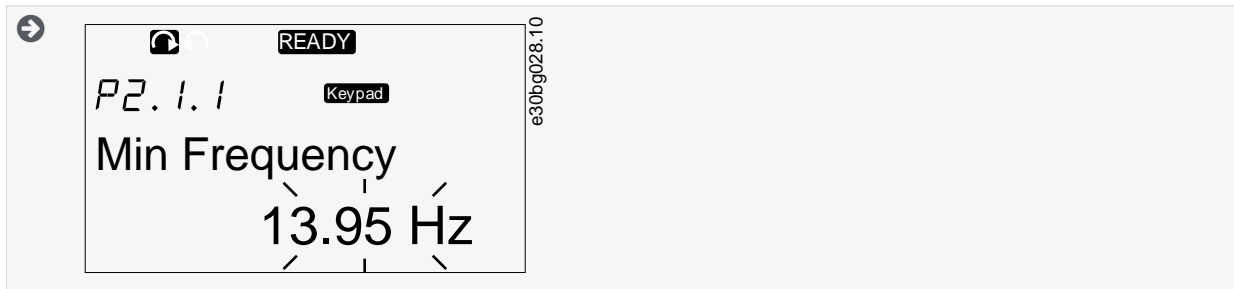
8.3.2

"All in One+( )" 7  
 VACON®  
 가 RUN(가 ) 가 Locked( )  
 AC

1. Browser( ) (P#) Browser( ) .

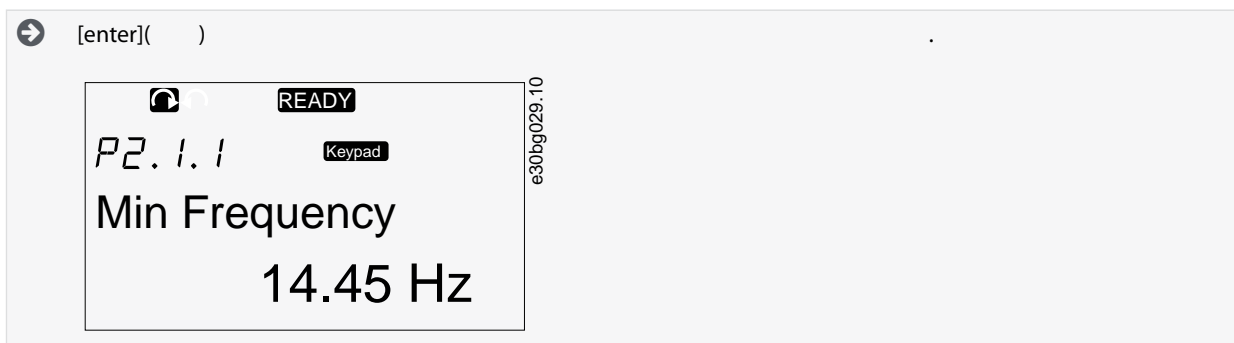


2. Menu( )



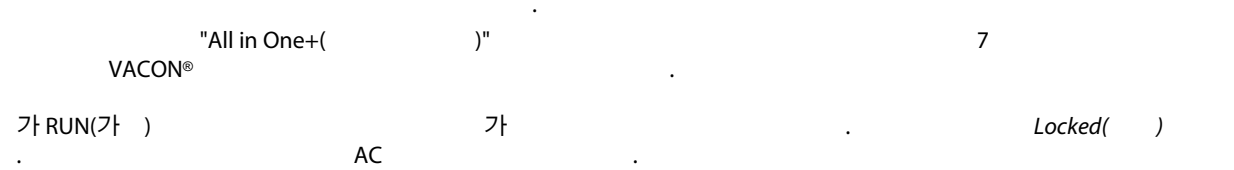
3. Browser( )

4. [enter]( ) Menu( )



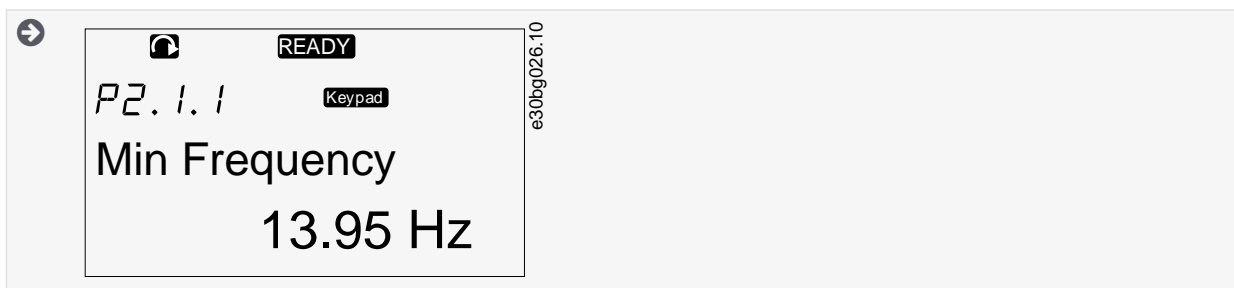
5. M6 Parameter Lock( ) [\(8.7.6.6\)](#)

### 8.3.3

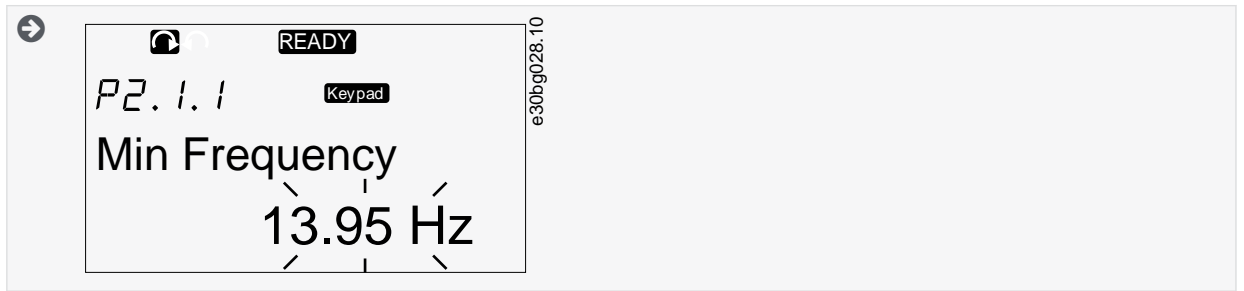


가 RUN(가 ) 가 Locked( )

1. Browser( ) Menu( )

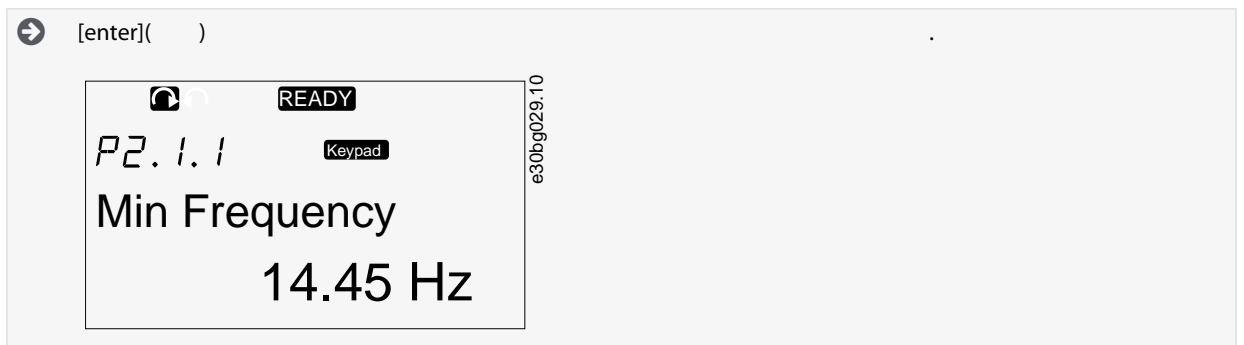


2. Menu( )



3. Menu( )

4. [enter]( )



5. M6 Parameter Lock( )

[\(8.7.6.6\)](#)

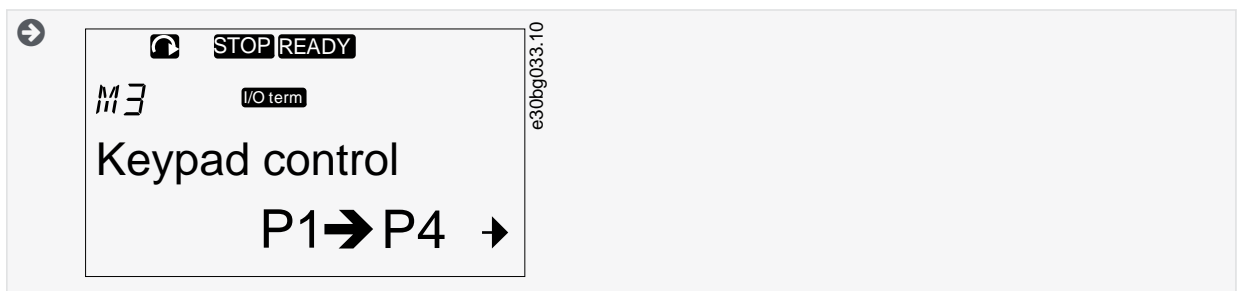
## 8.4 Keypad Control( )

### 8.4.1 Keypad Control( )

Keypad control( )

1. Keypad control( )

M3



2. Keypad control( )

Menu( )

### 8.4.2 Keypad Control( ) M3

							ID	
P3.1	Control place( )	1	3	-	1	125	1 = I/O terminal(I/O )	

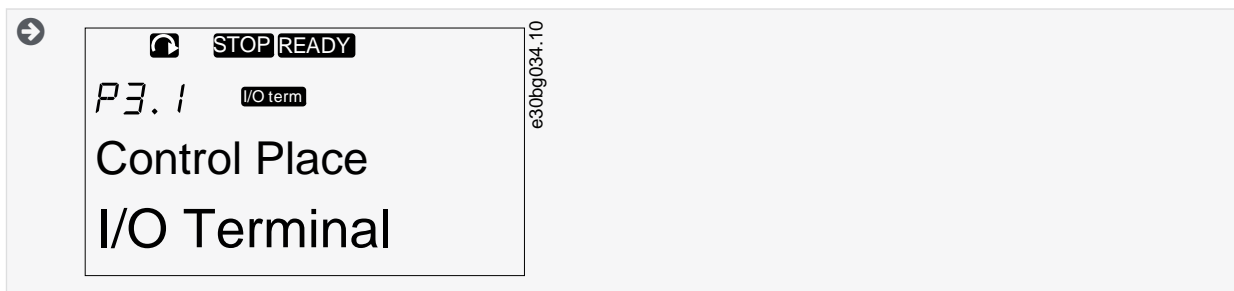
							ID	
								2 = Keypad (control panel)( ) 3 = Fieldbus( )
R3.2	Keypad reference( )	P2.1.1	P2.1.2	Hz	0.00		123	0 = Forward( ) 1 = Reverse( )
P3.3	Direction (on keypad)(( ) )	0	1	-	0		-	-
P3.4	Stop button( )	0	1	-	1		114	0 = Limited function of Stop button( ) 1 = Stop button always enabled( )

### 8.4.3

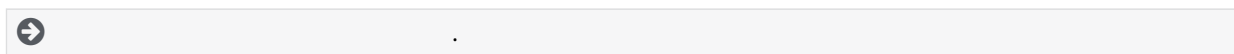
AC 3가 가

I/O	I/O term
( )	Keypad
	Bus/Comm

1. Keypad control( ) (M3) Menu( ) (Control Place( ))



2. Menu( )



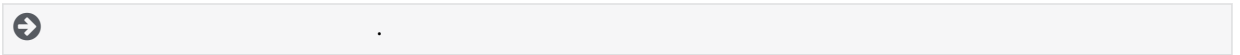
3. Browser( )
4. [enter]( )

### 8.4.4 Keypad Reference( )

Keypad reference( ) (P3.2)

### 8.4.4.1

1. Keypad control( ) (M3) Menu( ) Keypad reference( )
2. Menu( )
3. Browser( )

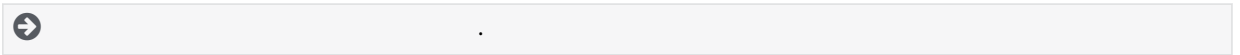


4. (8.4.3 ).

### 8.4.5

[3.8.2](#) [9.2 AC](#)

1. Keypad control( ) (M3) Menu( ) Keypad direction( )
2. Menu( )
3. Menu( )

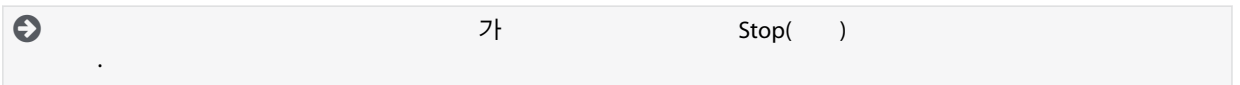


4. (8.4.3 ).

### 8.4.6

Stop( ) 가

1. Keypad control( ) (M3) Browser( ) 3.4. Stop( )
2. Menu( )
3. Yes( ) No( ) Browser( )
4. [enter]( )



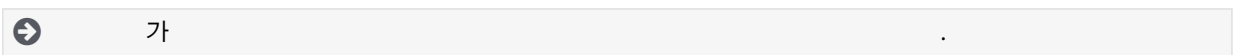
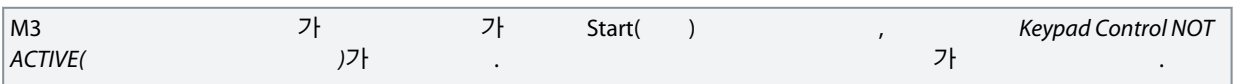
### 8.4.7 Keypad Control( )

#### 8.4.7.1

M3

M3 가

1.
  - 가 RUN(가 ) Start( ) 3
  - 가 Stop( ) 3



### 8.4.7.2

M3

I/O

M3

가

1. [enter]( ) 3



### 8.5 Active Faults( ) (M4)

#### 8.5.1 Active Faults( )

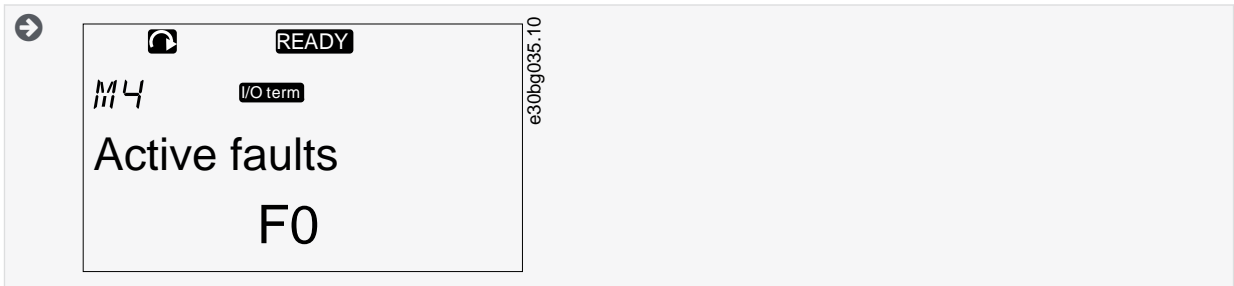
Active Faults( )

가

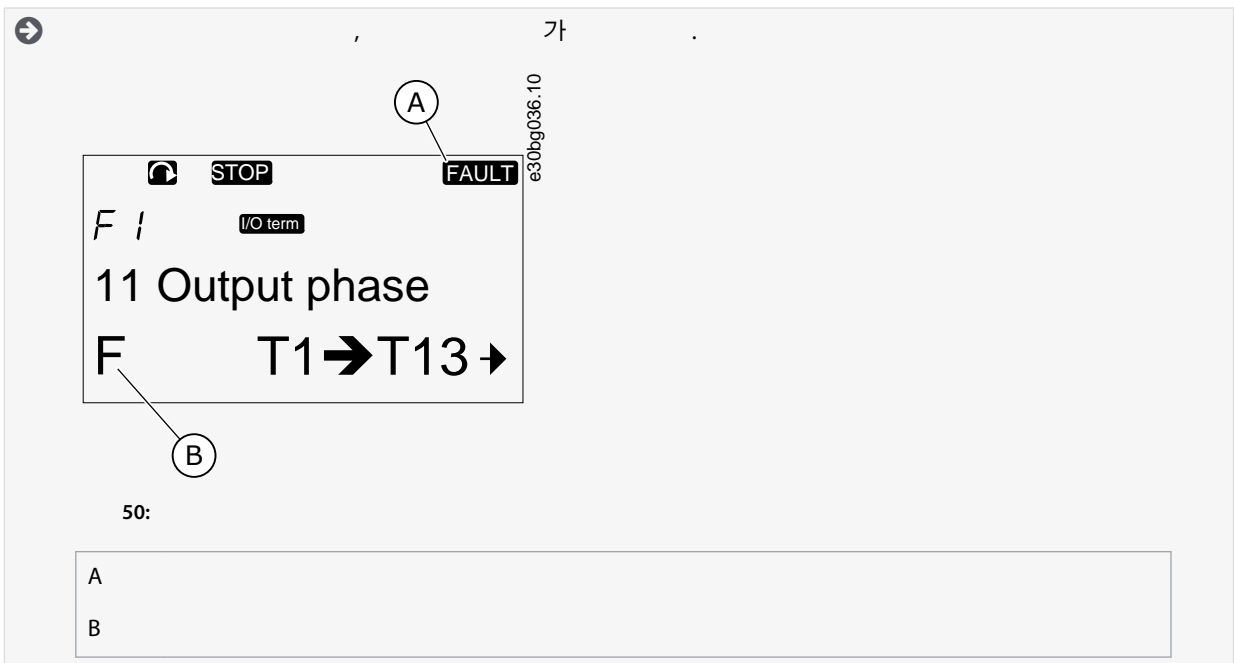
[11.1](#)

[11.2](#)

1. Active faults( ) M4가



2. Active faults( ) Menu( )



### 8.5.2

1. Active faults( ) Fault history( )
2. Menu ( )
3. Browser( ) T.1-T.16

### 8.5.3

AC , T1 T2가

가 .가 가

T.1		d	yyyy-mm-dd
T.2		hh:mm:ss (d)	hh:mm:ss,sss
T.3		Hz (hh:mm:ss)	-
T.4		A	-
T.5		V	-
T.6		%	-
T.7		%	-
T.8	DC	V	-
T.9		°C	-
T.10	가	-	-
T.11		-	-
T.12		-	-
T.13	0- <sup>(1)</sup>	-	-
T.14		-	-
T.15		-	-
T.16		-	-

<sup>1</sup> 가0 (< 0.01 Hz)

## 8.6 Fault History( ) (M5)

### 8.6.1 Fault History( ) (M5)

30

[\(8.5.3\)](#)

(H1->H#)  
H5.1가

(H5.30)

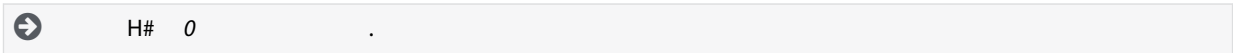
H5.2가

30 .가

### 8.6.2 Fault History( )

Fault History( ) 30

1. Fault history( ) M5가
2. Fault history( ) Menu( )
3. Fault history( ) [enter]( ) 3



### 8.7 System( ) (M6)

#### 8.7.1 System( )

System( ) AC 가 S# ( P#)

1. System( ) M6
2. System( ) Menu( )



#### 8.7.2 System Menu( )

13: System Menu( )

S6.1	Language selection( )	-	-	-	English( )		
S6.2	Application selection( )	-	-	-	Basic appli- cation( )	Basic application( ) Standard application( ) Local/Remote control appl.( / )	



						Multi-Step application( ) PID Control application(PID ) Multi-Purpose Control appl.( ) Pump and Fan Control appl.( )
S6.3	Copy parameters( )	-	-	-	-	-
S6.3.1	Parameter sets( )	-	-	-	-	Store set 1( 1 ) Load set 1( 1 ) Store set 2( 2 ) Load set 2( 2 ) Load factory defaults( )
S6.3.2	Load up to keypad( )	-	-	-	-	All parameters( )
S6.3.3	Load down from keypad( )	-	-	-	-	All parameters( ) All but motor parameters( ) Application parameters( )
P6.3.4	Parameter back-up( )	-	-	-	Yes( )	Yes( ) No( )
S6.4	Compare parameters( )	-	-	-	-	-
S6.4.1	Set1( 1)	-	-	-	Not used( )	-
S6.4.2	Set 2( 2)	-	-	-	Not used( )	-
S6.4.3	Factory settings( )	-	-	-	-	-

S6.4.4	Keypad set( )	-	-	-	-		-
S6.5	Security( )	-	-	-	-		-
S6.5.1	Password( )	-	-	-	Not used( )		0 = Not used( )
P6.5.2	Parameter lock( )	-	-	-	Change Enabled( )		Change Enabled( ) Change Disabled( )
S6.5.3	Start-up wizard( )	-	-	-	-		No( ) Yes( )
S6.5.4	Multimonitoring items( )	-	-	-	-		Change Enabled( ) Change Disabled( )
S6.6	Keypad settings( )	-	-	-	-		-
P6.6.1	Default page( )	-	-	-	-		-
P6.6.2	Default page( )/ Operating menu( )	-	-	-	-		-
P6.6.3	Timeout time( )	0	65535	s	30		-
P6.6.4	Contrast( )	0	31	-	18		-
P6.6.5	Backlight time( )	Always( )	65535	min	10		-
S6.7	Hardware settings( )	-	-	-	-		-
P6.7.1	Internal brake resistor( )	-	-	-	Connected( )		Not connected( ) Connected( )
P6.7.2	Fan control( )	-	-	-	Continuous( )		Continuous( ) Temperature( ) First start( ) Calc temp( )
P6.7.3	HMI acknowledg. timeout(HMI )	200	5000	ms	200		-

P6.7.4	HMI number of retries(HMI )	1	10	-	5		-
P6.7.5	Sine filter( )	-	-	-	Connected( )		Not connected( ) Connected( )
S6.8	System information( )	-	-	-	-		-
S6.8.1	Total counters( )	-	-	-	-		-
C6.8.1.1	MWh counter(MWh )	-	-	kWh	-		-
C6.8.1.2	Power On day counter( 가 )	-	-	-	-		-
C6.8.1.3	Power On hours counter( 가 )	-	-	hh:mm:ss	-		-
S6.8.2	Trip counters( )	-	-	-	-		-
T6.8.2.1	MWh counter(MWh )	-	-	kWh	-		-
T6.8.2.2	Clear MWh trip counter(MWh )	-	-	-	-		-
T6.8.2.3	Operating days trip counter( )	-	-	-	-		-
T6.8.2.4	Operating hours trip counter( )	-	-	hh:mm:ss	-		-
T6.8.2.5	Clear operating time counter( )	-	-	-	-		-
S6.8.3	Software info( )	-	-	-	-		-
S6.8.3.1	Software package( )	-	-	-	-		-
S6.8.3.2	System software version( )	-	-	-	-		-
S6.8.3.4	System load( )	-	-	-	-		-
S6.8.4	Applications( )	-	-	-	-		-
S6.8.4.#	Name of application( )	-	-	-	-		-

D6.8.4.#. 1	Application ID( ID)	-	-	-	-	-
D6.8.4.#. 2	Applications( ): Version( )	-	-	-	-	-
D6.8.4.#. 3	Applications( ): Firmware interface( )	-	-	-	-	-
S6.8.5	Hardware( )	-	-	-	-	-
I6.8.5.1	Info( ): Power unit type code( )	-	-	-	-	-
I6.8.5.2	Info( ): Unit voltage( )	-	-	-	-	-
I6.8.5.3	Info( ): Brake chopper( )	-	-	-	-	-
I6.8.5.4	Info( ): Brake resistor( )	-	-	-	-	-
S6.8.6	Expander boards( )	-	-	-	-	-
S6.8.7	Debug menu( )	-	-	-	-	-

### 8.7.3

가

1. System( ) (M6) Browser( ) Language( ) (S6.1)
2. Menu( )

→

- 3.
4. [enter]( )

→ 가

### 8.7.4

가 Application selection( ) (S6.2)  
 VACON® NX

1. System( ) (M6) Browser( ) Application selection( ) (S6.2, Application( ))
2. Menu( )
3. Menu( )

↩

4. Browser( )
5. [enter]( )

↩ AC 가

6. Copy parameters?( )가 2가

P6.3.4 Parameter back-up( ) Yes( )

- - Browser( ) Yes( )
- - Browser( )
- No( )

8.7.5 (S6.3)  
 AC AC AC  
 AC

8.7.5.1 (Parameter Sets( ) S6.3.1)  
 1-2  
 가

1. Copy parameters( )(S6.3) Browser( ) Parameter sets( ) (S6.3.1)
2. Menu( )
3. Menu( )

↩ LoadFactDef( )가

4. 5가 . Browser( )
- - LoadFactDef( )
- - Store set 1( 1 ) 1
- - Load set 1( 1 ) 1
- - Store set 2( 2 ) 2
- - Load set 2( 2 ) 2

5. [enter]( )
6. OK( )가

8.7.5.2 (Up To Keypad( ), S6.3.2)  
 AC 가

1. Copy parameters( )(S6.3) Up to keypad( ) (S6.3.2)
2. Menu( )
3. Menu( )

↩ All param.( )

4. [enter]( )
5. OK( )가

### 8.7.5.3 (Down From Keypad( ), S6.3.3)

1. Copy parameters( ) (S6.3) Down from keypad( ) (S6.3.3)
2. Menu( )
3. Menu( )
4. Browser( ) 3
  - - (All param.( ))
  - - (All. no motor( ))
  - - Application parameters( )
5. [enter]( )
6. OK( )가

### 8.7.5.4 Activating or Deactivating the Automatic Parameter Back-up( ) (P6.3.4)

S6.3.1 가

1. Copy parameters( ) (S6.3) Automatic parameter back-up( ) (S6.3.4)
  2. Menu( )
  3. 2가
    - - Browser( ) Yes( )
    - - Browser( ) No( )
- 가

### 8.7.5.5 (S6.4, Param.Comparison( ))

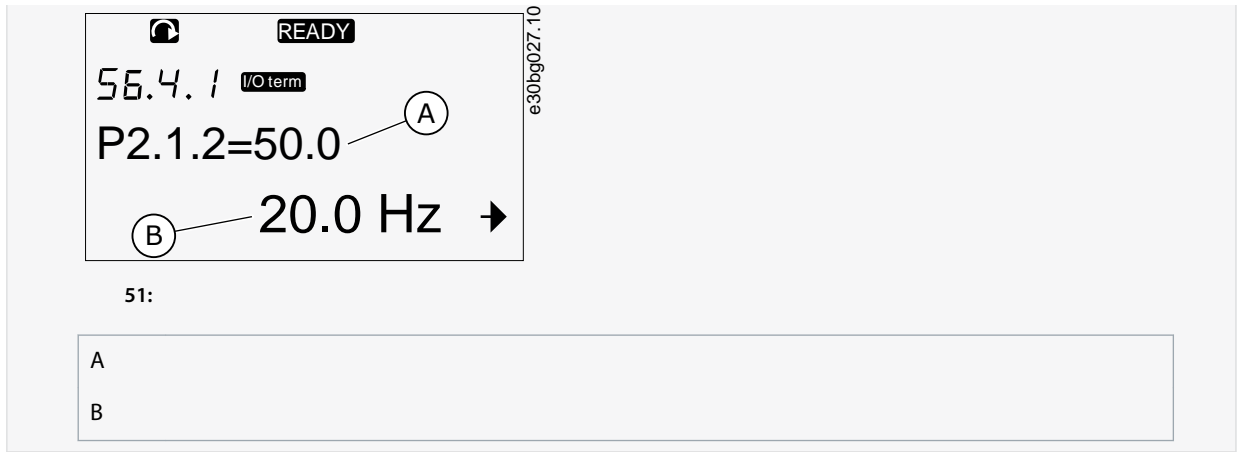
Key pad Set( ) Set 1( 1), Set 2( 2), Factory Settings( )

1. Copy parameters( ) (S6.3) Browser( ) Comparing parameters( )
2. Menu( )

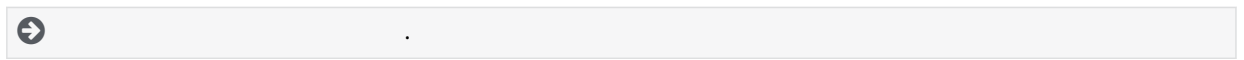
0 가 Set 1( 1) 가 ( , P1->P5 =

가 5 ).

3. Browser( )
4. Menu( )



5. Menu( )



6. Browser( ) Menu( )

### 8.7.6

#### 8.7.6.1 Security( )

Security( )

1. Security( ) S6.5가 System( )

2. System( ) Security( ) Menu( )

#### 8.7.6.2 Password( )

Password( ) (S6.5.1)

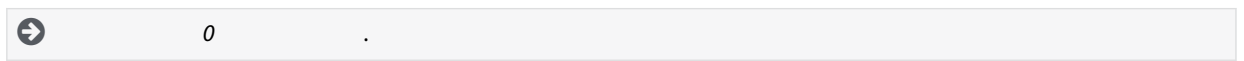


#### 8.7.6.3



1. Security( ) Menu( )

2. Menu( )



3. 2가 . Browser( )

1 65535

- - Browser( ) : Browser( )

- - : Menu( ) 0

Browser( )

Menu( )

가

Menu( )  
Browser( )

. Menu( ) Browser( )

5

4.

[enter]( )

Timeout time( )(P6.6.3) ([8.7.7.4](#) ).

### 8.7.6.4

Password?( )가

1.

Password?( )가 Browser( )

### 8.7.6.5

1. Security( ) Browser( ) Password( )(S6.5.1)

2. Menu( )

3. 0

### 8.7.6.6

Parameter lock( ) 가 Parameter lock( )  
locked( )가



1. Security( ) (M6) Browser( ) Parameter lock( )(P6.5.2)

2. Menu( )

3. Parameter lock( ) Browser( )

4. [enter]( )

### 8.7.6.7 Start-up Wizard( )(P6.5.3)

AC

가

- 
- 
- 
- 

	[enter]( )
	Browser( )
	Browser( )



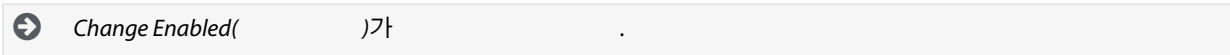
8.7.6.8

1. System( ) (M6) P6.5.3
2. Menu( )
3.
  - - Browser( ) Yes( )
  - - Browser( ) No( )
4. [enter]( )

8.7.6.9

Multimonitoring( ) 3 (8.2 Monitoring( ) (M1)).

1. Security( ) Browser( ) Multimonitoring items( ) (P6.5.4, Multimon. items( ))
2. Menu( )



3. Browser( ) Change Enabled( ) Change Disabled( )
4. [enter]( )

8.7.7

8.7.7.1 Keypad Settings( )

System( ) Keypad settings( ) 5 (P#)가

- Default page( ) (P6.6.1)
- Default page( )/Operating menu( ) (P6.6.2)
- Timeout time( ) (P6.6.3)
- Contrast adjustment( ) (P6.6.4)
- Backlight time( ) (P6.6.5)

1. System( ) (M6) Browser( ) Keypad settings( ) (S6.6)

8.7.7.2

ON ( )

[8.7.7.4](#)

0 가

1. Keypad settings( ) Browser( ) Default page( ) (P6.6.1)
2. Menu( )
3. Browser( )

4. / Menu( ) . Browser( ) /

5. Menu( ) . Browser( )

6. [enter]( )

### 8.7.7.3 Operating Menu( ) Default Page( ) (P6.6.2)

Operating Menu( ) ON [\(8.7.7.4\)](#)  
[8.7.7.2](#)

Operating( ) 가

### 8.7.7.4

Timeout time( ) Default page( ) (P6.6.1)

[\(8.7.7.2\)](#) .

Default page( ) 0 Timeout time( )

1. Keypad settings( ) Browser( ) Timeout time( ) (P6.6.3)

2. Menu( )

3. Browser( )

4. [enter]( )

### 8.7.7.5 Contrast adjustment( ) (P6.6.4)

[\(8.7.7.4\)](#) .

### 8.7.7.6 Backlight Time( ) (P6.6.5)

1 65535 Forever( )  
[8.7.7.4](#)

### 8.7.8

#### 8.7.8.1 Hardware Setting( )

System( ) (S6.7, HW settings( )) AC

- , InternBrakeRes
- Fan control( )
- HMI , HMI ACK timeout
- HMI retry(HMI )
- Sine filter( )
- Pre-charge mode( ) .

Hardware settings( ) [\(8.7.6.2 Password\( \)\)](#) .

1. Hardware settings( ) S6.7  
 System( )

2. System( ) Hardware settings( ) Menu( )

#### 8.7.8.2

AC

AC Connected( )  
 Not conn.( )

- 가
  - 가 FR4 ~ FR6
1. Hardware settings( ) Browser( ) (6.7.1)
  2. Menu( )
  3. Browser( )
  4. [enter]( )

### 8.7.8.3 Fan Control( )

- AC 47가
  - Continuous( )( ). 가
  - Temperature( ). 가 60 °C (140 °F) AC 가
    - 가 55 °C (131 °F)
    - AC 가
    - Continuous( ) Temperature( )
  - First start( ). 가 .AC 가
  - Calc temp( ). IGBT
    - IGBT 가 40 °C (104 °F)
    - IGBT 가 30 °C (86 °F)
    - 가 가 25 °C (77 °F)
- [8.7.8.4 Fan Control\( \)](#)

### 8.7.8.4 Fan Control( )

- Fan Control( )
1. Hardware settings( ) Browser( ) Fan control( ) (6.7.2)
  2. Menu( )
- 
3. Browser( )
  4. [enter]( )

### 8.7.8.5 HMI Acknowledge Timeout(HMI )(P6.7.3)

- HMI .RS232 , ,
  - AC 가 PC , 6.7.3 6.7.4 (200 5)
  - AC 가 PC , 6.7.3
- [8.7.8.6 HMI](#)

- ,AC PC 600 ms
- 6.7.3 1200 ms(2 x 600, + )
- NCDrive.ini [Misc]( )

- Retries( ) = 5
- AckTimeOut( ) = 1200
- TimeOut( ) = 6000

NC-Drive AckTimeOut( )

### 8.7.8.6 HMI

HMI

1. Hardware settings ( ) Browser( ) HMI (HMI ACK timeout(HMI ))
2. Menu( )
3. Browser( )
4. [enter]( )

### 8.7.8.7 HMI

(P6.7.4)

(P6.7.3)

AC

가

1. Hardware settings ( ) Browser( ) HMI (P6.7.4)
2. Menu( )
3. Browser( )
4. [enter]( )

### 8.7.8.8 Sine Filter( )(P6.7.5)

AC

dU/dt

가 AC

Connected( )

### 8.7.8.9 Pre-charge Mode( )(P6.7.6)

FI9 , Ext.ChSwitch( )

## 8.7.9

### 8.7.9.1 System Info( )

System info( ) (S6.8) AC 가

1. System info( ) S6.8 System( )
2. System( ) System info( ) Menu( )

### 8.7.9.2 Total Counters( )(S6.8.1)

Total counters( ) (S6.8.1) AC 가 MWh, Total counters( )

Power On time counter( 가 )( 가 +24 V 가

14: Total Counters( )

C6.8.1.1.	MWh counter(MWh )	

C6.8.1.2.	Power On day counter( 가 )	1.013 . 가1 13 .
C6.8.1.3	Power On hour counter( 가 )	7:05:16 . 가7 5 16 .

8.7.9.3 Trip Counters( )(S6.8.2)

Trip counters( ) (S6.8.2) 가 , , 0  
가 가

15:

T6.8.2.1	MWh	-
T6.8.2.3		1.013 . 가1 13 .
T6.8.2.4		7:05:16 . 가7 5 16 .

8.7.9.4 Trip Counters( )

1. System info( ) Browser( ) Trip counters( ) (6.8.2)
2. Clear MWh counter(MWh ) (6.8.2.2, Clr MWh cntr(MWh )) Clear Operation time  
counter( ) (6.8.2.5, Clr Optime cntr( ))  
Menu( )
3. Menu( )
4. Reset( ) Browser( )
5. [enter]( )
6. Not reset( )

8.7.9.5 Software( )(S6.8.3)

Software( ) AC 가

6.8.3.1	Software package( )
6.8.3.2	System software version( )
6.8.3.3	Firmware interface( )
6.8.3.4	System load( )

8.7.9.6 Applications( )(S6.8.4)

Applications( ) (S6.8.4) AC 가

6.8.4.#	Name of application( )
---------	------------------------

6.8.4.#.1	Application ID(                    ID)
6.8.4.#.2	Version(                    )
6.8.4.#.3	Firmware interface(                    )

### 8.7.9.7 Application(                    )

Applications(                    )

1. System info(                    )                    Browser(                    )                    Applications(                    )
2. Applications(                    )                    Menu(                    )
3.                    Browser(                    )                    .AC                    가
4. Information(                    )                    Menu(                    )
5.                    Browser(                    )

### 8.7.9.8 Hardware(                    )(S6.8.5)

Hardware(                    )                    AC                    가

6.8.5.1	Power unit type code(                    )
6.8.5.2	Nominal voltage of the unit(                    )
6.8.5.3	Brake chopper(                    )
6.8.5.4	Brake resistor(                    )
6.8.5.5	Serial number(                    )

### 8.7.9.9

Expander boards(                    )

[7.1](#)

[8.8.1 Expander Board\(                    \)](#)

1. System info(                    )                    Browser(                    )                    Expander boards(                    )                    (6.8.6)
2. Expander boards(                    )                    Menu(                    )
3.                    Browser(                    )

➔                    가                    no board(                    )가                    .                    가                    no conn.(                    )                    .

4.                    Menu(                    )
5.                    Browser(                    )

### 8.7.9.10 Debug(                    ) (S6.8.7)

Debug(                    )

## 8.8 Expander Board( )

### 8.8.1 Expander Board( )

Expander board( ) , , .

- 
- 

16: ( OPTA1)

P7.1.1.1	AI1 mode(AI1 )	1	5	3		1 = 0–20 mA 2 = 4–20 mA 3 = 0–10 V 4 = 2–10 V 5 = –10...+10 V
P7.1.1.2	AI2 mode(AI2 )	1	5	1		P7.1.1.1
P7.1.1.3	AO1 mode(AO1 )	1	4	1		1 = 0–20 mA 2 = 4–20 mA 3 = 0–10 V 4 = 2–10 V

### 8.8.2

1. Expander board( ) M7
2. Expander board( ) Menu( )
3. Browser( )
4. Menu( )

### 8.8.3

1. Expander Board( ) Browser( ) Menu( )
  2. Menu( )
  3. [8.8.2](#) Browser( )
  4. Menu( )
  5. Browser( )
  6. Menu( ) [8.3.2](#)
- [8.3.3](#)

## 8.9 가

VACON® NX

VACON NX

# 9

## 9.1

⚠ ⚠

가  
- 가 가

⚠ ⚠

U, V, W, 가 가  
- 가 U, V, W, 가

⚠ ⚠

DC 가 가 5  
- :  
가  
AC ( / ) 가  
5

⚠ ⚠

가

⚠ ⚠

AC FR8  
- AC FR8

⚠ ⚠

AC FR6 가 가  
- AC FR6



## 9.2 AC

AC

[2.1](#) [9.1](#)

1. 가
2. 가
3. AC 가
4. ,

- [6.1.3](#)
- [6.1](#)
- [6.2 EMC](#)

5. [6.5.1](#) 가
6. 가
- 7.
8. 가
- 9.
10. +24 V가
- 11.

- 가
- [5.2.1](#)
  - [5.2.2 FR4 ~ FR9](#)
  - [5.2.3 AC \(FR10 ~ FR11\)](#)
  - [12.8 VACON® NXP](#)

12. AC
13. 가
14. ([12.3.1](#) )

## 9.3

!AC

- ([9.3.1](#) )
- ([9.3.2](#) )
- ([9.3.3](#) )

### 9.3.1

1. U, V W
2. 1 2, 1 3, 2 3
- 3.
4. 20 °C (68 °F) >1 MΩ

### 9.3.2

1. L1, L2 L3
2. 1 2, 1 3, 2 3
- 3.
4. 20 °C (68 °F) >1 MΩ

### 9.3.3



- 1.
- 2.
3. 1000 V
4. 20 °C (68 °F) >1 MΩ
- 5.
- 6.
- 7.

## 9.4

### 9.4.1 AC

- 
- 가

1. START( ) STOP( ) 가 STOP( )
- 2.
3. 1 (VACON® )

4. ( , )
5.
  - a. 가 (9.4.2 가 )
  - b. (9.4.3 )
  - c. ID (9.4.4 ID )

### 9.4.2 가

A B

- A:
- B:

9.4.2.1 A:

가 I/O RUN(가 )

1. Start/Stop( / ) ON( )
2. (가 )
3. Monitoring( ) M1
4. Start/Stop( / ) OFF( )

9.4.2.2 B:

가 RUN(가 )

1. [8.4.3](#)
2. Start( )
3. Keypad control( ) (M3) Keypad Reference( ) [\(8.4.4 Keypad Reference\( \)\)](#) Browser( )
4. Monitoring( ) M1
5. Stop( )

9.4.3

가 가 가

1. Start/Stop( / ) 가 Stop( )
- 2.
- 3.
4. 가
5. 가 A B [\(9.4.2 가 \)](#).
6. 가 가
7. 가가 ID 가 가가 ID [.9.4.4 ID](#)

9.4.4 ID

ID ID ID 가 ID VACON® ID631

# 10

## 10.1

VACON® NX AC 가

17:

12 <sup>(1)</sup>	AC 12 (10.2 ).
6-24 <sup>(2)</sup>	<ul style="list-style-type: none"> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>•</li> <li>• FR10 (IP54)</li> </ul>
5-7	<ul style="list-style-type: none"> <li>•</li> <li>• IP54 (UL 12)</li> <li>• /</li> </ul>
8-15 <sup>(3)</sup>	DC

<sup>1</sup> (AC )

<sup>2</sup> ( )

<sup>3</sup> DC 15 8-15 가 80% 가 25 °C (77 °F) ,

## 10.2

DC ( ) ,DC DC

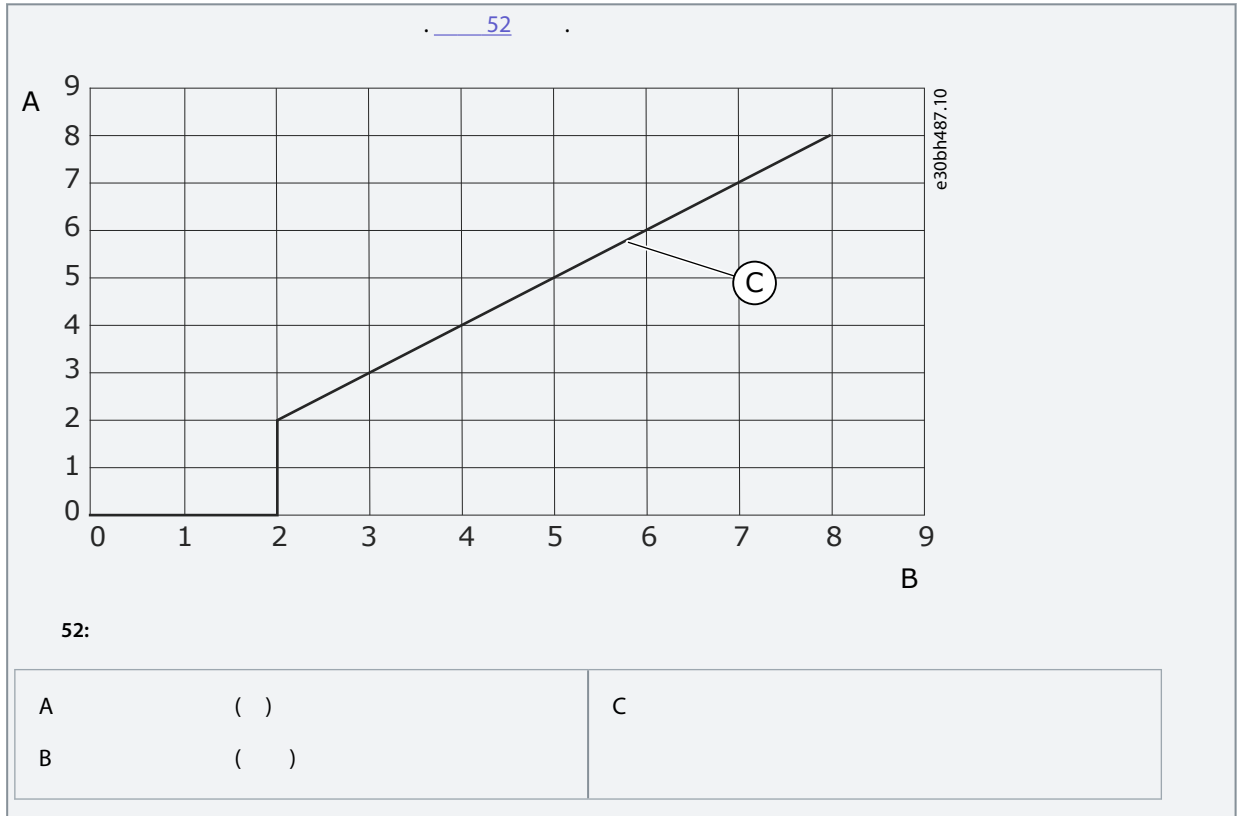
가

- AC ,가 Danfoss Drives®

**1:2**

1. DC DC L1 L2 B+/B (DC+ B+ ,DC- B- )  
 . B+/B- 가 NX AC (FR8-FR9/FI8-FI9) 2 (L1 L2) DC
2. 800 mA
3. DC AC (1.35\*U<sub>n</sub> AC)

4.



5.

2:2

1. DC            DC+/DC-
2.                    800 mA
3. DC
- 4.



5.

# 11

## 11.1

AC

- (8.5.1 Active Faults( ) )
- F1
- ( )
- 
- ( 18 )
- FAULT( ) ALARM( )
- LED가 ( )
- , Browser( )

VACON® NX AC

4가

18:

A (Alarm( ))	A fault (Alarm)(A ( )) 'A fault(A )' 30
F (Fault( ))	'F fault(F )'
AR (Fault Autore-set( ))	'AR fault(AR )' (FT, Fault Trip( ) )
FT (Fault Trip( ))	AR 가 FT 'FT fault(FT )' AC

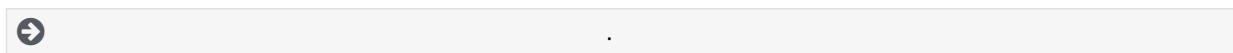
(11.2 )

10

[reset]( ) PC Fault history( )  
, Active Faults( ) Fault History( )

## 11.2

1. 가
2. 2가
- [reset]( ) 2
- -I/O



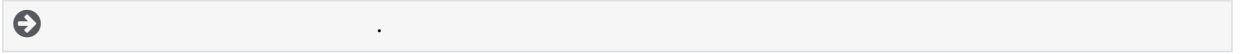
## 11.3

VACON® NCDrive PC

---

VACON® NCDrive PC 가 <http://drives.danfoss.com/downloads/portal/>

1. VACON® NCDrive
2. File( ) Service Info...( ...)



- 3.

## 12

### 12.1 AC

	, IP21/IP54 [kg]	, UL 1/ 12 [lb.]
FR4	5.0	11.0
FR5	8.1	17.9
FR6	18.5	40.8
FR7	35.0	77.2
FR8	58.0	128
FR9	146	322
FR10	340	750
FR11 <sup>(1)</sup>	470	1036
FR11 <sup>(1)</sup> , 0460–0502, 690 V	400	882

<sup>1</sup> IP21

## 12.2

### 12.2.1

NXS/NXP AC

AC

:

- [12.2.2.1 FR4–FR6](#)
- [12.2.2.2 FR7](#)
- [12.2.2.3 FR8](#)
- [12.2.2.4 FR9](#)

AC

:

- [12.2.3.1](#), FR4–FR6
- [12.2.3.2](#), FR7–FR8
- [12.2.3.3](#), FR9

AC

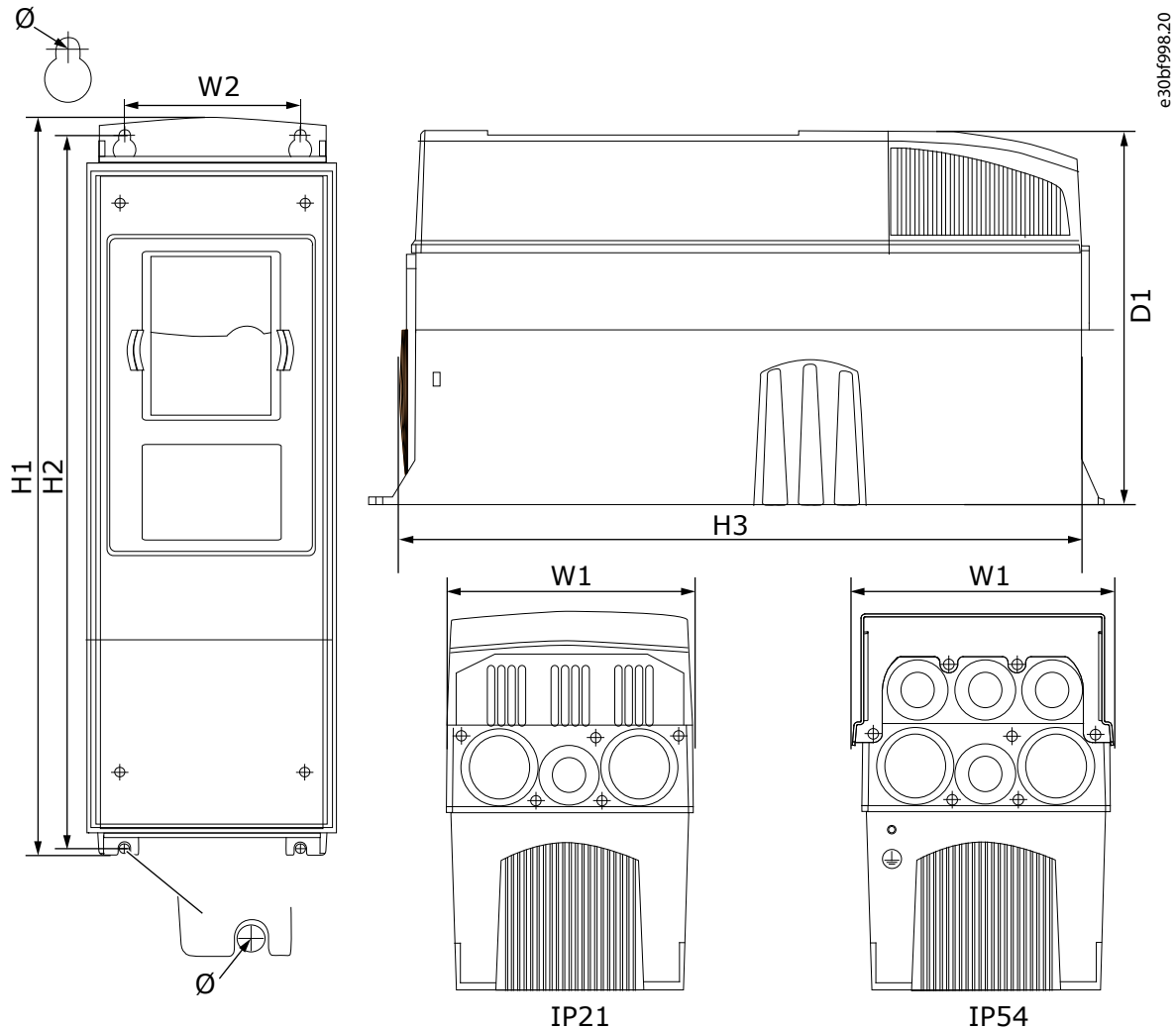
:

- [12.2.4.1 FR10–FR11](#)



12.2.2

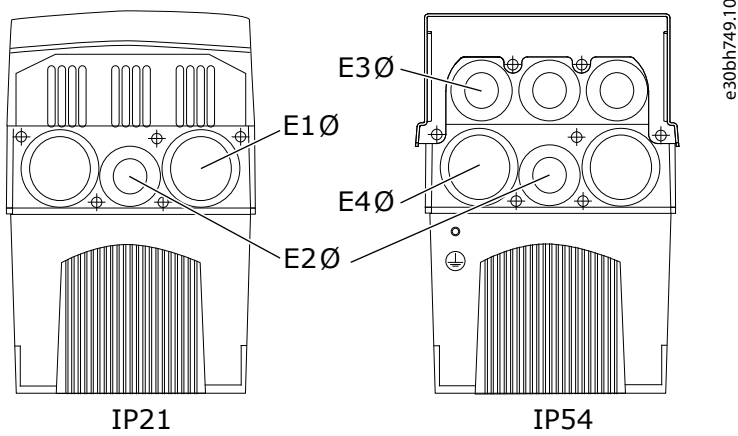
12.2.2.1 FR4–FR6



53: VACON® NXS/NXP AC , FR4–FR6

19: VACON® NXS/NXP AC , FR4–FR6 (mm (inch))

	W1	W2	H1	H2	H3	D1	Ø
• 0003 2–0012 2	128	100	327	313	292	190	7
• 0003 5–0012 5	(5.04)	(3.94)	(12.87)	(12.32)	(11.5)	(7.48)	(0.27)
• 0017 2–0031 2	144	100	419	406	391	214	7
• 0016 5–0031 5	(5.67)	(3.94)	(16.5)	(15.98)	(15.39)	(8.43)	(0.27)
• 0048 2–0061 2	195	148	558	541	519	237	9
• 0038 5–0061 5	(7.68)	(5.83)	(21.97)	(21.3)	(20.43)	(9.33)	(0.35)
• 0004 6–0034 6							



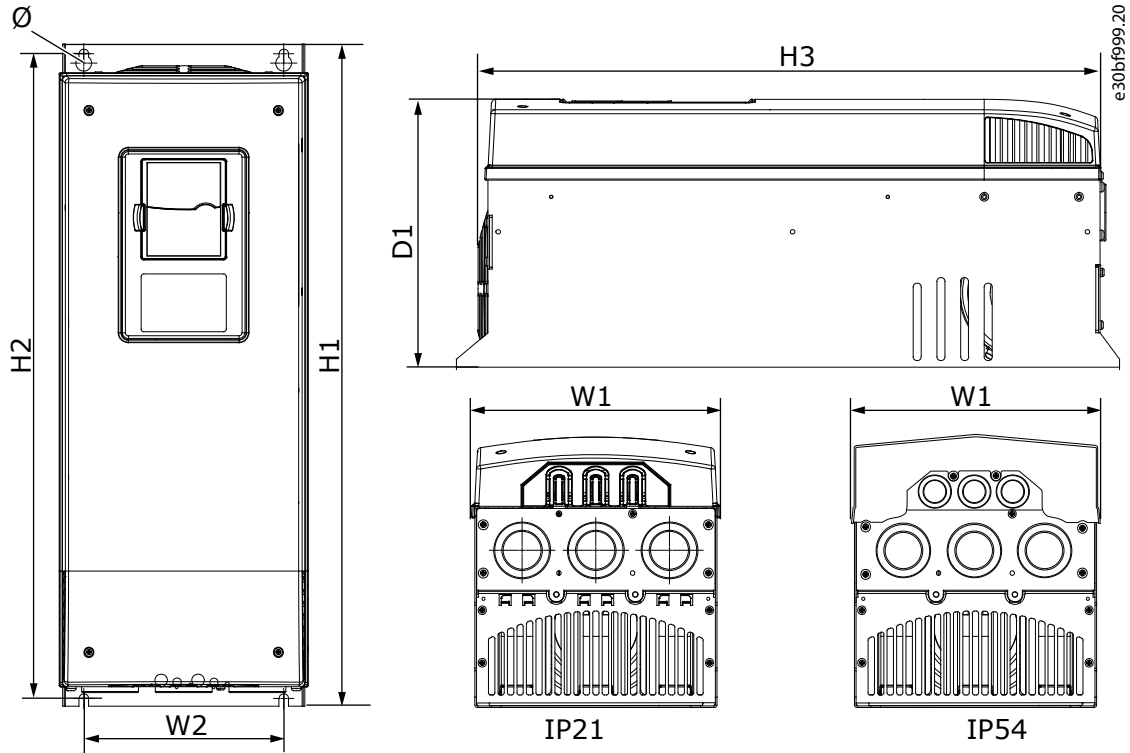
54: VACON® NXS/NXP AC , FR4-FR6

20: VACON® NXS/NXP AC , FR4-FR6 (mm (inch))

	E1Ø, (1)	E1Ø, (1)	E2Ø, (1)	E2Ø, (1)	E3Ø, (1)	E3Ø, (1)	E4Ø, (1)	E4Ø, (1)
<ul style="list-style-type: none"> <li>• 0003 2-0012 2</li> <li>• 0003 5-0012 5</li> </ul>	13.5 (0.53)	20.3 (0.80)	13.5 (0.53)	20.3 (0.80)	<ul style="list-style-type: none"> <li>• +QGLM: 13.5 (0.53)</li> <li>• +QGLC: 21 (0.83)</li> </ul>	<ul style="list-style-type: none"> <li>• +QGLM: 20.3 (0.80)</li> <li>• +QGLC: 28 (1.1)</li> </ul>	<ul style="list-style-type: none"> <li>• +QGLM: 16 (0.63)</li> <li>• +QGLC: 21 (0.83)</li> </ul>	<ul style="list-style-type: none"> <li>• +QGLM: 25.3 (3 x 1.0)</li> <li>• +QGLC: 28 (1.1)</li> </ul>
<ul style="list-style-type: none"> <li>• 0017 2-0025 2</li> <li>• 0016 5-0022 5</li> </ul>	16 (0.63)	3 x 25.3 (3 x 1.0)	16 (0.63)	3 x 25.3 (3 x 1.0)	16 (0.63)	6 x 25.3 (6 x 1.0)	16 (0.63)	6 x 25.3 (6 x 1.0)
<ul style="list-style-type: none"> <li>• 0031 2</li> <li>• 0031 5</li> </ul>	21 (0.83)	33 (1.30)	16 (0.63)	25.3 (1.0)	21 (0.83)	25.3 (1.0)	16 (0.63)	33 (1.30)
<ul style="list-style-type: none"> <li>• 0048 2-0061 2</li> <li>• 0038 5-0061 5</li> <li>• 0004 6-0034 6</li> </ul>	21 (0.83)	3 x 33 (3 x 1.30)	21 (0.83)	3 x 33 (3 x 1.30)	16 (0.63)	<ul style="list-style-type: none"> <li>• +QGLM: 3 x 25.3 (3 x 1.0)</li> <li>• +QGLC: 3 x 28.3 (3 x 1.11)</li> </ul>	<ul style="list-style-type: none"> <li>• +QGLM: 21 (0.83)</li> <li>• +QGLC: 29 (1.14)</li> </ul>	<ul style="list-style-type: none"> <li>• +QGLM: 3 x 33 (3 x 1.30)</li> <li>• +QGLC: 3 x 37 (3 x 1.46)</li> </ul>

1

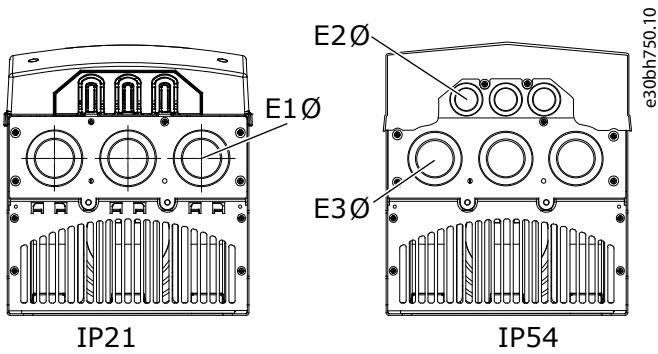
12.2.2.2 FR7



55: VACON® NXS/NXP AC , FR7

21: VACON® NXS/NXP AC , FR7 (mm (inch))

	W1	W2	H1	H2	H3	D1	$\varnothing$
• 0075 2-0114 2	237	190	630	614	591	257	9
• 0072 5-0105 5	(9.33)	(7.48)	(24.80)	(24.17)	(23.27)	(10.12)	(0.35)
• 0041 6-0052 6							



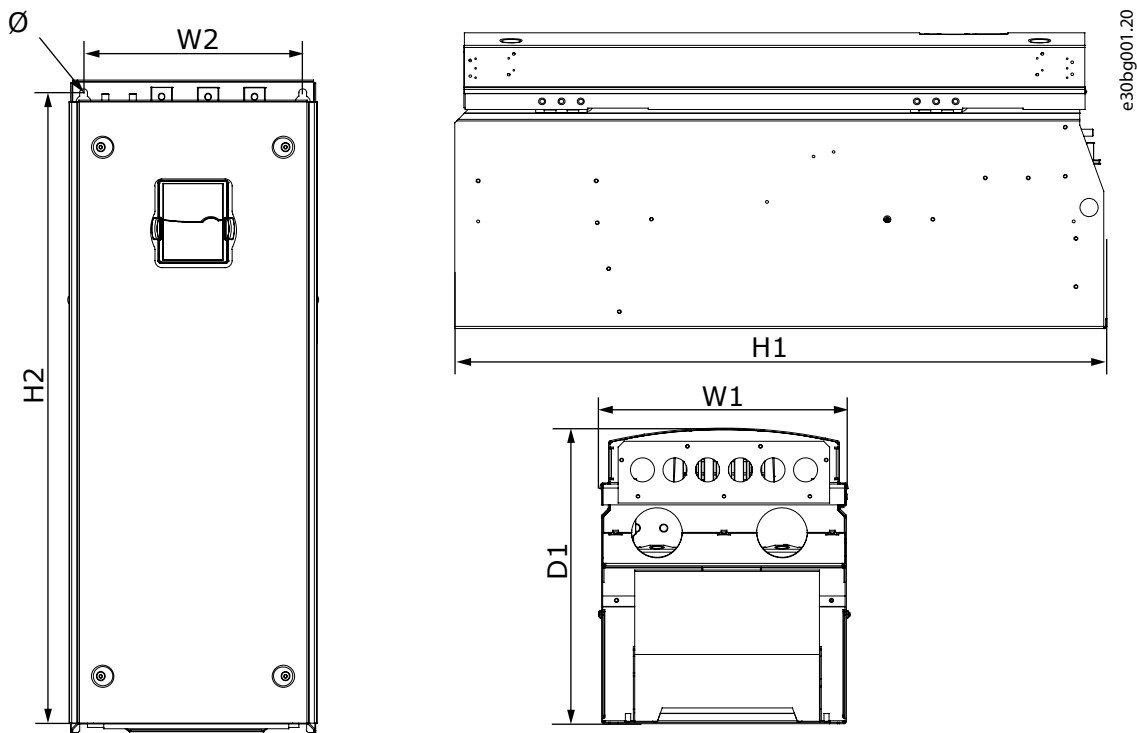
56: VACON® NXS/NXP AC , FR7

22: VACON® NXS/NXP AC , FR7 (mm (inch))

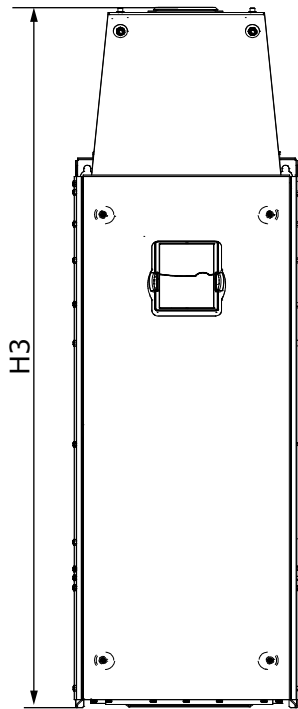
	E1Ø, (1)	E1Ø,	E2Ø, (1)	E2Ø,	E3Ø, (1)	E3Ø,
<ul style="list-style-type: none"> <li>• 0075 2-0114 2</li> <li>• 0072 5-0105 5</li> <li>• 0041 6-0052 6</li> </ul>	36 (1.42)	3 x 50.3 (3 x 1.98)	21 (0.83)	3 x 28.3 (3 x 1.11)	36 (1.42)	3 x 50.3 (3 x 1.98)

1

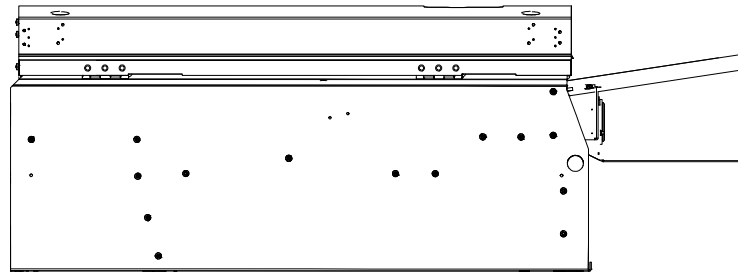
12.2.2.3 FR8



57: VACON® NXS/NXP AC , FR8



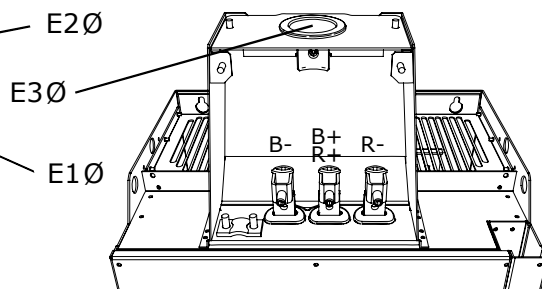
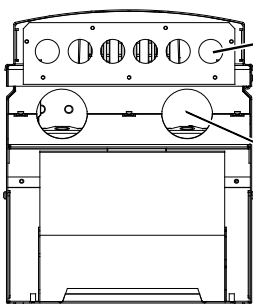
e30bh835.10



58: 가 VACON® NXS/NXP AC ,FR8

23: VACON® NXS/NXP AC ,FR8 (mm (inch))

	W1	W2	H1	H2	H3	D1	Ø
• 0140 2-0205 2	291	255	758	732	1008	344	9
• 0140 5-0205 5	(11.47)	(10.04)	(29.88)	(28.81)	(39.69)	(13.54)	(0.35)
• 0062 6-0100 6							



e30bh751.10

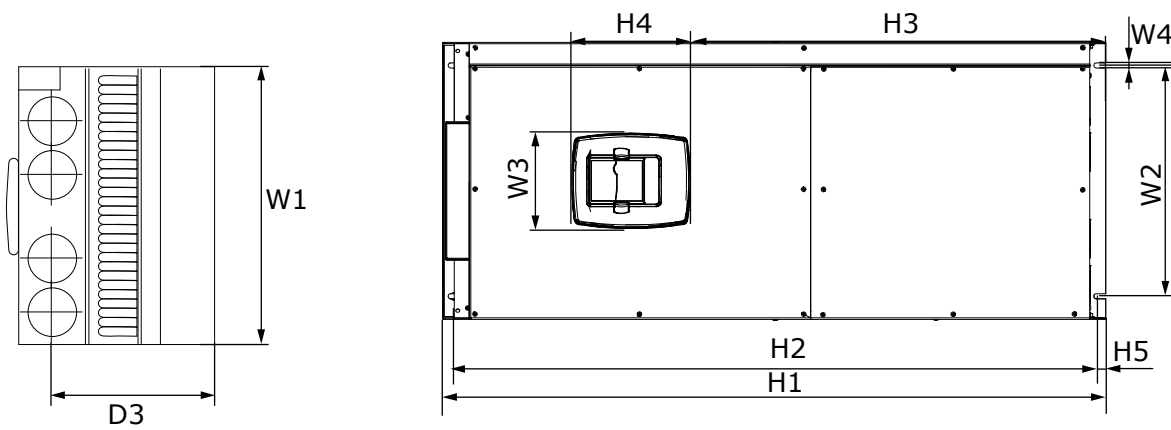
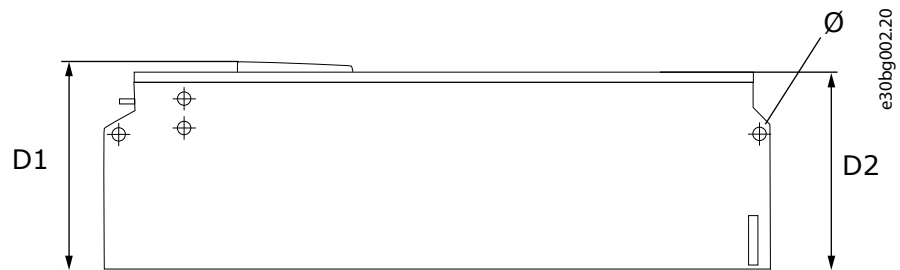
59: VACON® NXS/NXP AC ,FR8

24: VACON® NXS/NXP AC , FR8 (mm (inch))

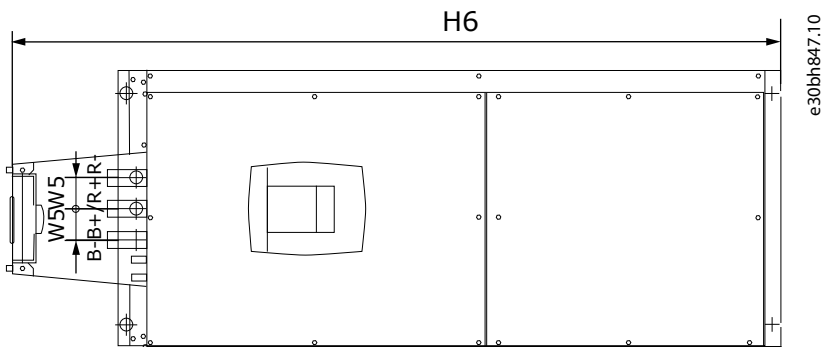
	E1Ø, <sup>(1)</sup>	E1Ø,	E2Ø, <sup>(1)</sup>	E2Ø,	E3Ø, <sup>(1)</sup>	E3Ø,
<ul style="list-style-type: none"> <li>• 0140 2-0205 2</li> <li>• 0140 5-0205 5</li> <li>• 0062 6-0100 6</li> </ul>	<ul style="list-style-type: none"> <li>• IP21: 2 x GD48, 48 (1.89)</li> <li>• IP54: 2 x MC07115, 56 (2.20)</li> </ul>	2 x 59 (2 x 2.32)	-	6 x 28 (6 x 1.10)	60 (2.36)	75 (2.95)

! 40 mm 360  
3x185+95 mm<sup>2</sup> MCCMK

12.2.2.4 FR9



60: VACON® NXS/NXP AC , FR9



61: 가 VACON® NXS/NXP AC , FR9

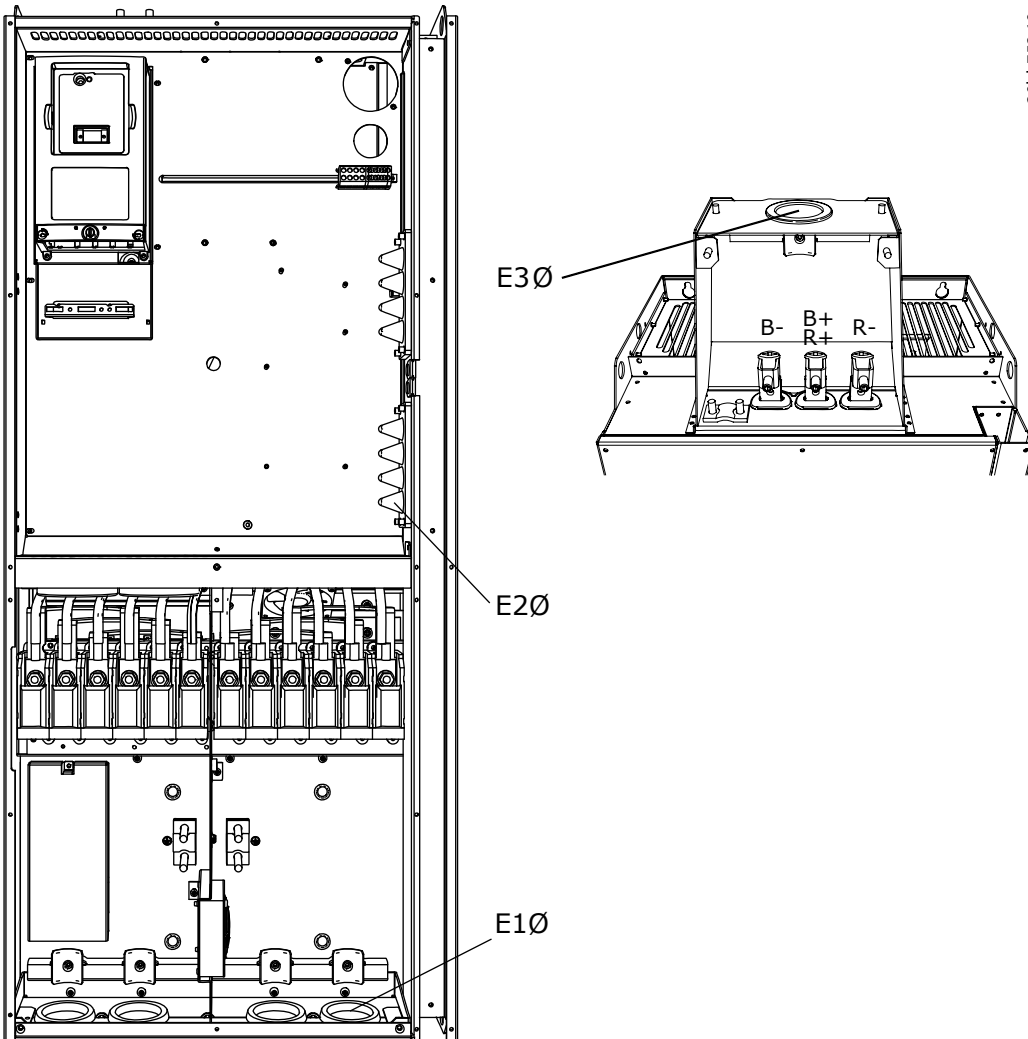
25: VACON® NXS/NXP AC , FR9, 1 (mm (inch))

	W1	W2	W3	W4	W5	D1	D2	D3
• 0261 2-0300 2	480	400	165	9	54	362	340	285
• 0261 5-0300 5	(18.9)	(15.75)	(15.74)	(0.35)	(2.13)	(14.25)	(13.39)	(11.22)
• 0125 6-0208 6								

26: VACON® NXS/NXP AC , FR9, 2 (mm (inch))

	H1	H2	H3	H4	H5	H6	Ø
• 0261 2-0300 2	1150	1120	721	205	16	1338	21
• 0261 5-0300 5	(45.28)	(44.09)	(28.39)	(8.07)	(0.63)	(52.68)	(0.83)
• 0125 6-0208 6	(1)						

1 (H6) 가 203 mm (7.99 inch) 가 . FR8 FR9 , 가 DC AC



62: VACON® NXS/NXP AC , FR9

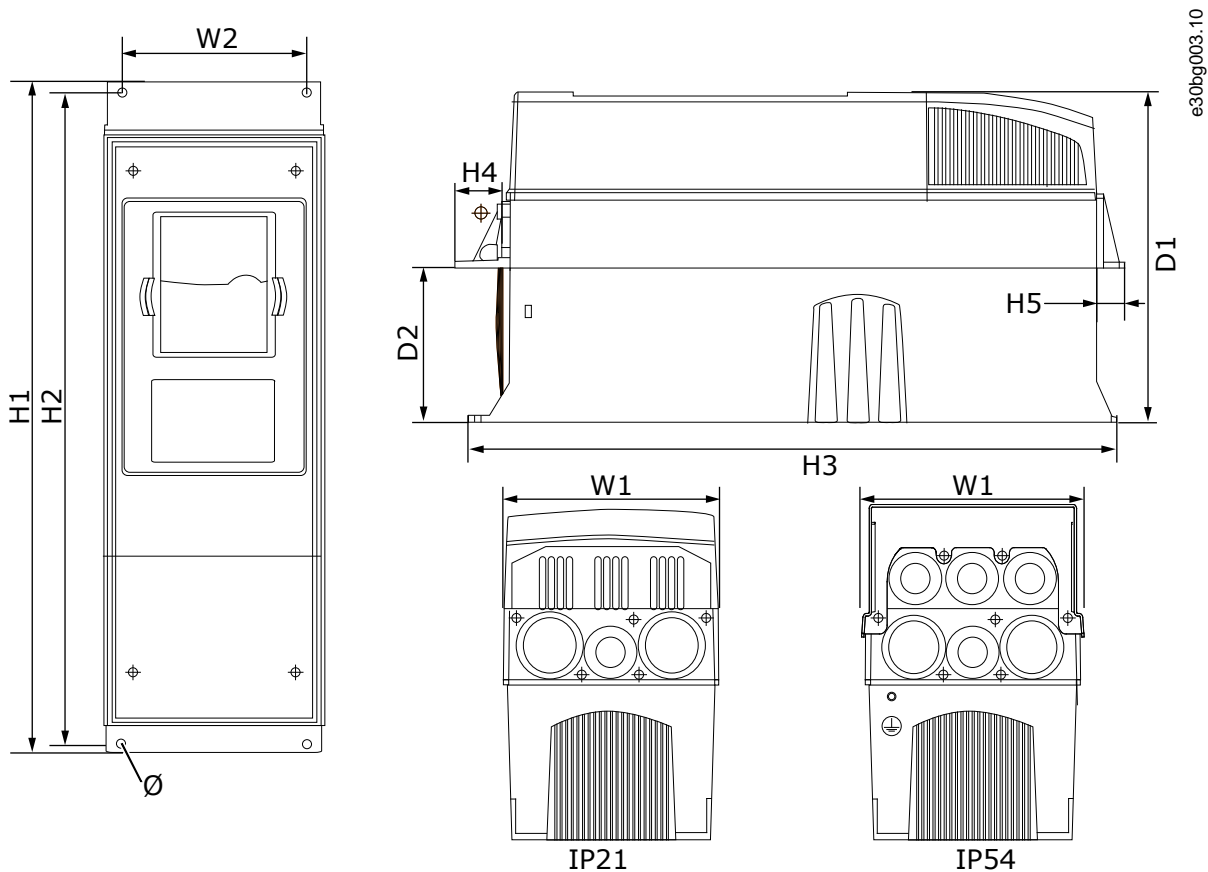
27: VACON® NXS/NXP AC , FR9 (mm (inch))

	E1Ø, <sup>(1)</sup>	E1Ø,	E2Ø, <sup>(1)</sup>	E2Ø,	E2Ø, <sup>(1)</sup>	E3Ø,
<ul style="list-style-type: none"> <li>• 0261 2–0300 2</li> <li>• 0261 5–0300 5</li> <li>• 0125 6–0208 6</li> </ul>	<ul style="list-style-type: none"> <li>• IP21: 4 x GD48, 48 (1.89)</li> <li>• IP54:                             <ul style="list-style-type: none"> <li>- 2 x GD48, 48 (1.89)</li> <li>- 2 x MC07115, 56 (2.20)</li> </ul> </li> </ul>	4 x 59 (4 x 2.32)	25 (0.98)	25 (0.98)	60 (2.36)	75 (2.95)

<sup>1</sup> ! 40 mm 360  
3x185+95 mm<sup>2</sup> MCCMK

12.2.3

12.2.3.1 , FR4–FR6



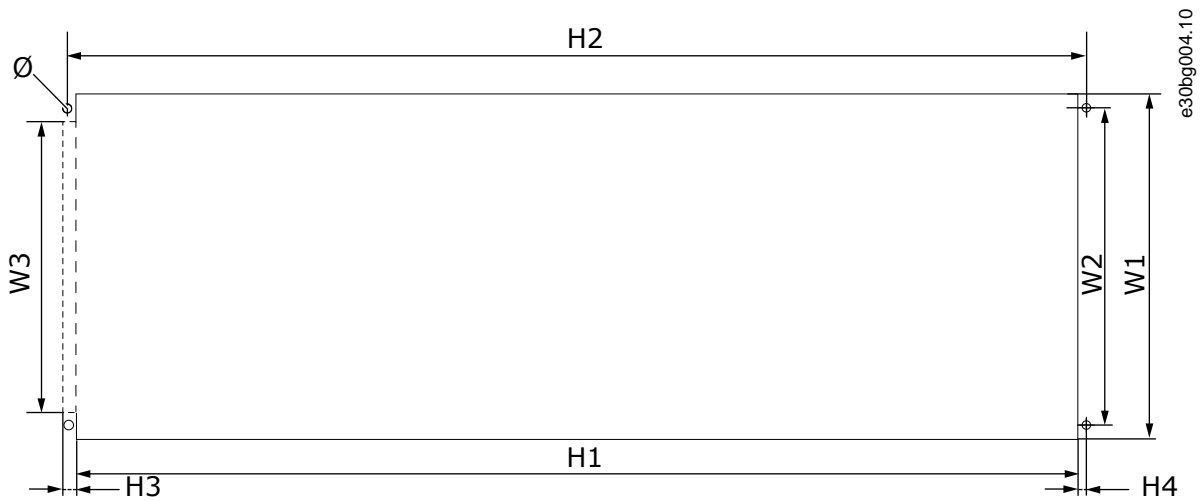
63: VACON® NXS/NXP AC , FR4–FR6

28: VACON® NXS/NXP AC , FR4–FR6 (mm (inch))

	W1	W2	H1	H2	H3	H4	H5	D1	D2	Ø
0004 2–0012 2 0003 5–0012 5	128 (5.03)	113 (4.45)	337 (13.27)	325 (12.8)	327 (12.9)	30 (1.18)	22 (0.87)	190 (7.48)	77 (3.03)	7 (0.27)
0017 2–0031 2	144 (5.67)	120 (4.72)	434 (17.09)	420 (16.54)	419 (16.5)	36 (1.42)	18 (0.71)	214 (8.43)	100 (3.94)	7 (0.27)



	W1	W2	H1	H2	H3	H4	H5	D1	D2	Ø
0016 5-0031 5										
0048 2-0061 2 0038 5-0061 5 0004 6-0034 6	195 (7.68)	170 (6.69)	560 (22.05)	549 (21.61)	558 (22)	30 (1.18)	20 (0.79)	237 (9.33)	106 (4.17)	6.5 (0.26)

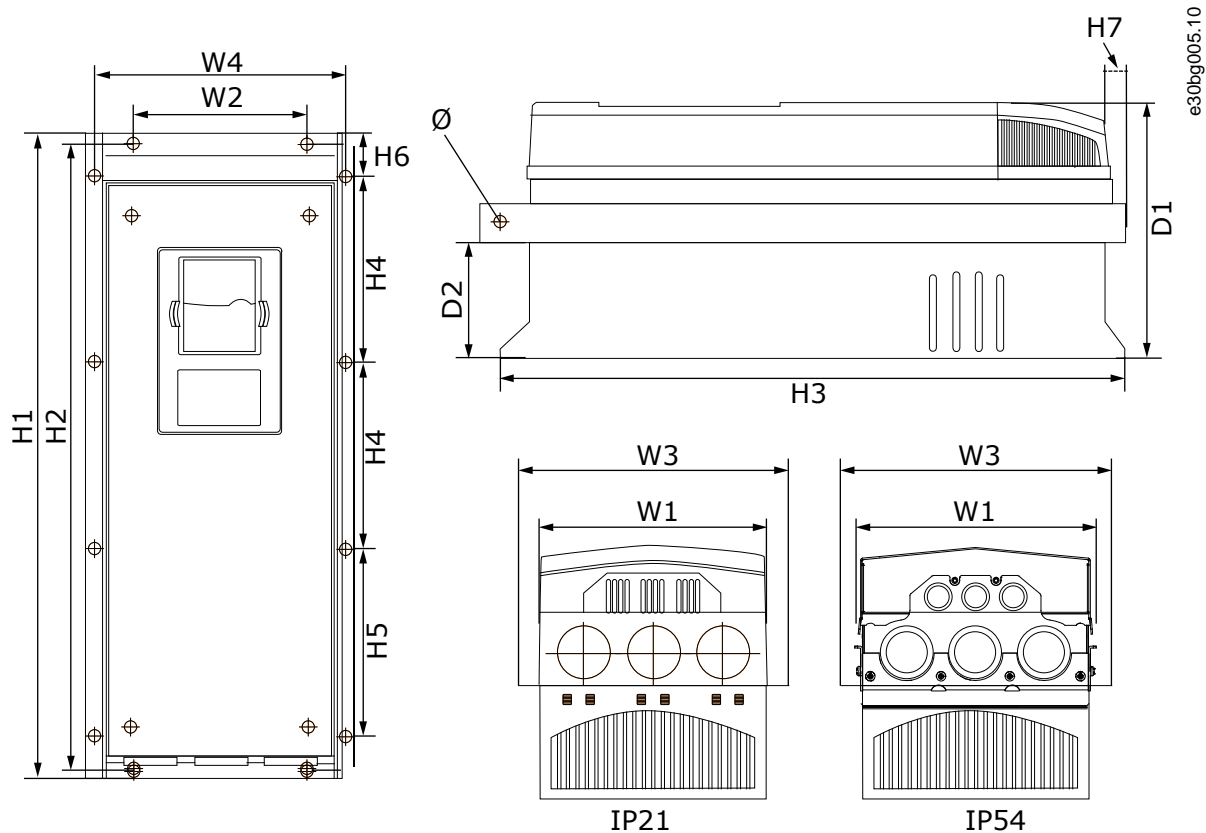


64: ( , FR4-FR6)

29: ( , FR4-FR6) (mm (inch))

	W1	W2	W3	H1	H2	H3	H4	Ø
0004 2-0012 2 0003 5-0012 5	123 (4.84)	113 (4.45)	- (-)	315 (12.40)	325 (12.8)	- (-)	5 (0.20)	6.5 (0.26)
0017 2-0031 2 0016 5-0031 5	135 (5.31)	120 (4.72)	- (-)	410 (16.14)	420 (16.54)	- (-)	5 (0.20)	6.5 (0.26)
0048 2-0061 2 0038 5-0061 5 0004 6-0034 6	185 (7.28)	170 (6.69)	157 (6.18)	539 (21.22)	549 (21.61)	7 (0.27)	5 (0.20)	6.5 (0.26)

12.2.3.2 , FR7-FR8



65: VACON® NXS/NXP AC , FR7-FR8

30: VACON® NXS/NXP AC , FR7-FR8, 1 (mm (inch))

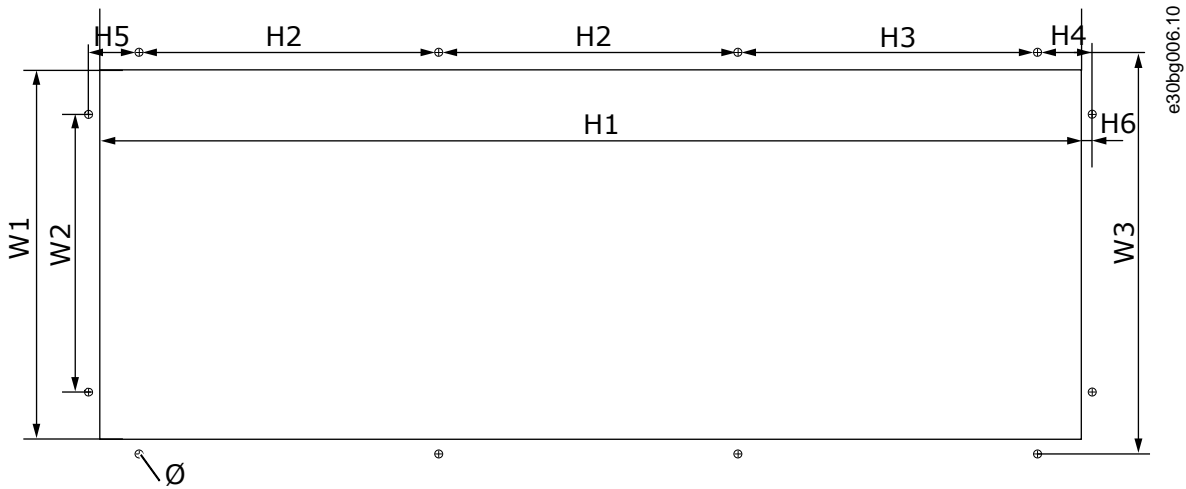
	W1	W2	W3	W4	D1	D2	Ø
0075 2-0114 2 0072 5-0105 5 0041 6-0052 6	237 (9.33)	175 (6.89)	270 (10.63)	253 (9.96)	257 (10.12)	109 (4.29)	6.5 (0.26)
0140 2-0205 2 0140 5-0205 5 0062 6-0100 6	289 (11.38)	- (-)	355 (13.98)	330 (12.99)	344 (13.54)	110 (4.33)	9 (0.35)

31: VACON® NXS/NXP AC , FR7-FR8, 2 (mm (inch))

	H1	H2	H3	H4	H5	H6	H7
0075 2-0114 2 0072 5-0105 5 0041 6-0052 6	652 (25.67)	632 (24.88)	630 (24.80)	188.5 (7.42)	188.5 (7.42)	23 (0.91)	20 (0.79)
0140 2-0205 2 0140 5-0205 5 0062 6-0100 6	832 (32.76) <sup>(1)</sup>	- (-)	759 (29.88)	258 (10.16)	265 (10.43)	43 (1.69)	57 (2.24)

<sup>1</sup> (202.5 mm (7.97 in))

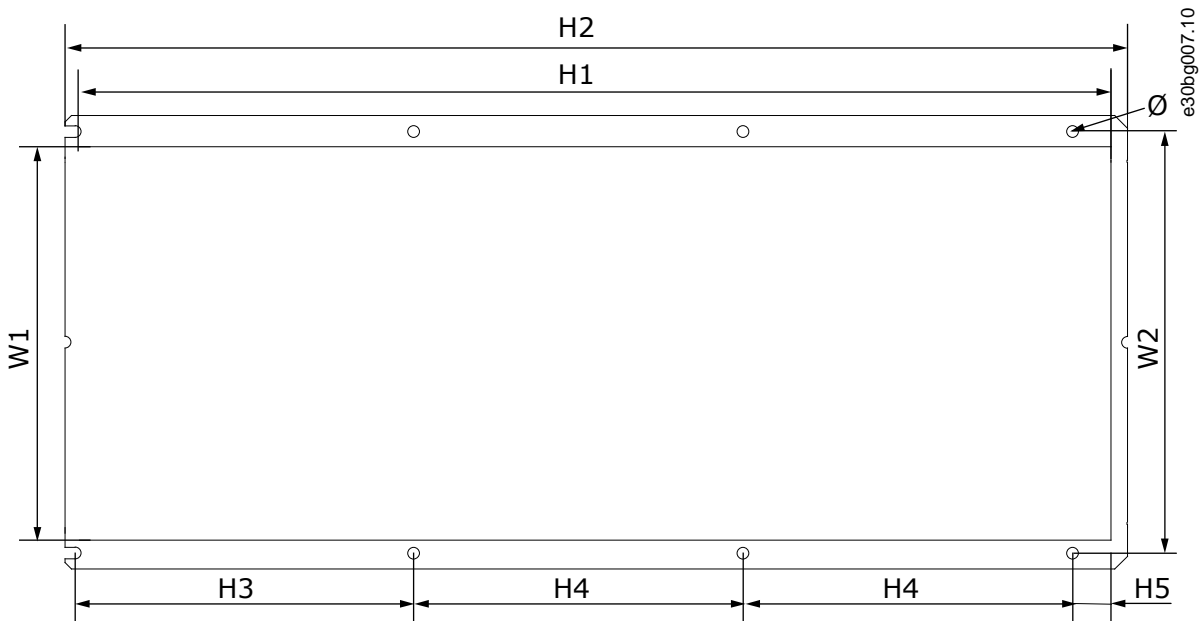
(68 mm (2.68 in))



66: ( ,FR7)

32: ( ,FR7) (mm (inch))

	W1	W2	W3	H1	H2	H3	H4	H5	H6	Ø
0075 2-0114 2	233	175	253	619	188.5	188.5	34.5	32	7	7
0072 5-0105 5	(9.17)	(6.89)	(9.96)	(24.4)	(7.42)	(7.42)	(1.36)	(1.26)	(0.28)	(0.28)
0041 6-0052 6										

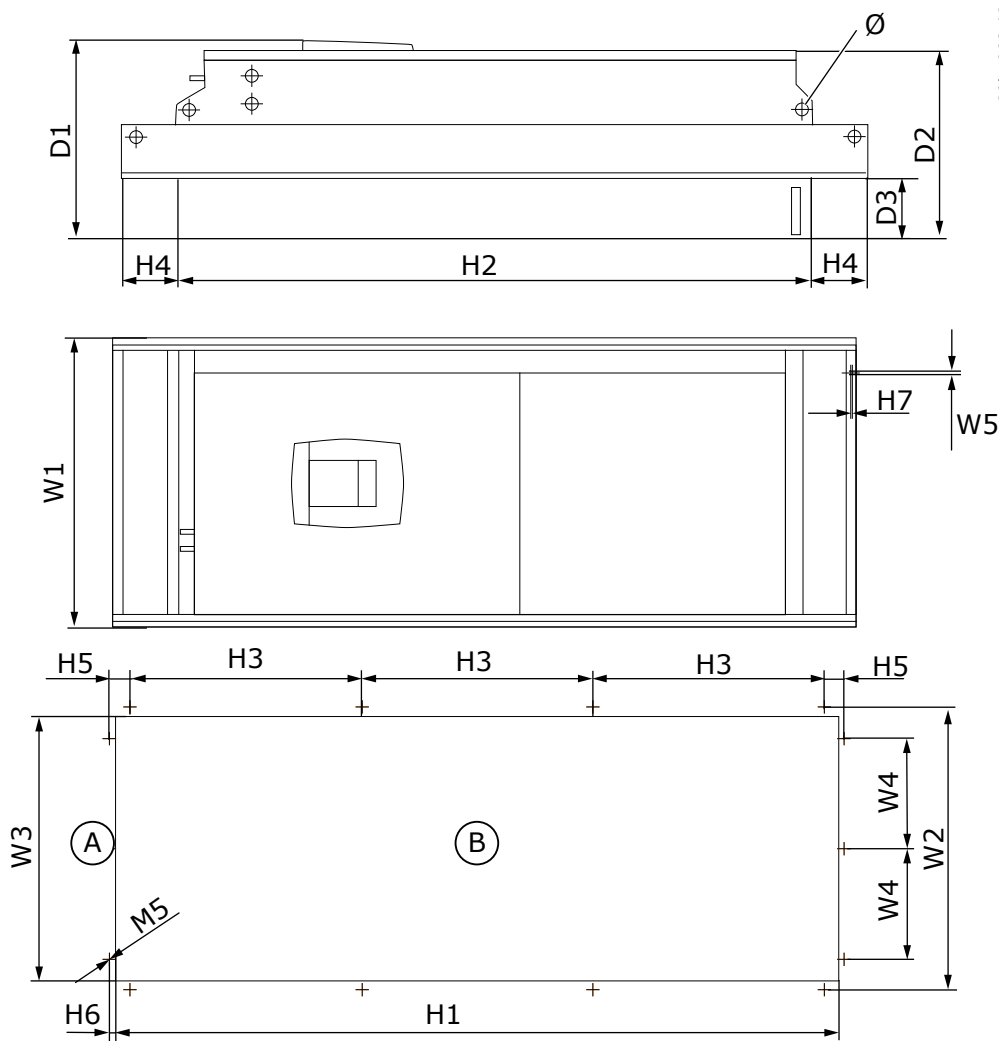


67: ( ,FR8)

33: ( ,FR8) (mm (inch))

	W1	W2	H1	H2	H3	H4	H5	Ø
0140 2-0205 2	301	330	810	832	265	258	33	9
0140 5-0205 5	(11.85)	(12.99)	(31.89)	(32.76)	(10.43)	(10.16)	(1.30)	(0.35)
0062 6-0100 6								

12.2.3.3 , FR9



e30bg008.10

68: VACON® NXS/NXP AC , FR9

A
B

34: VACON® NXS/NXP AC , FR9, 1 (mm (inch))

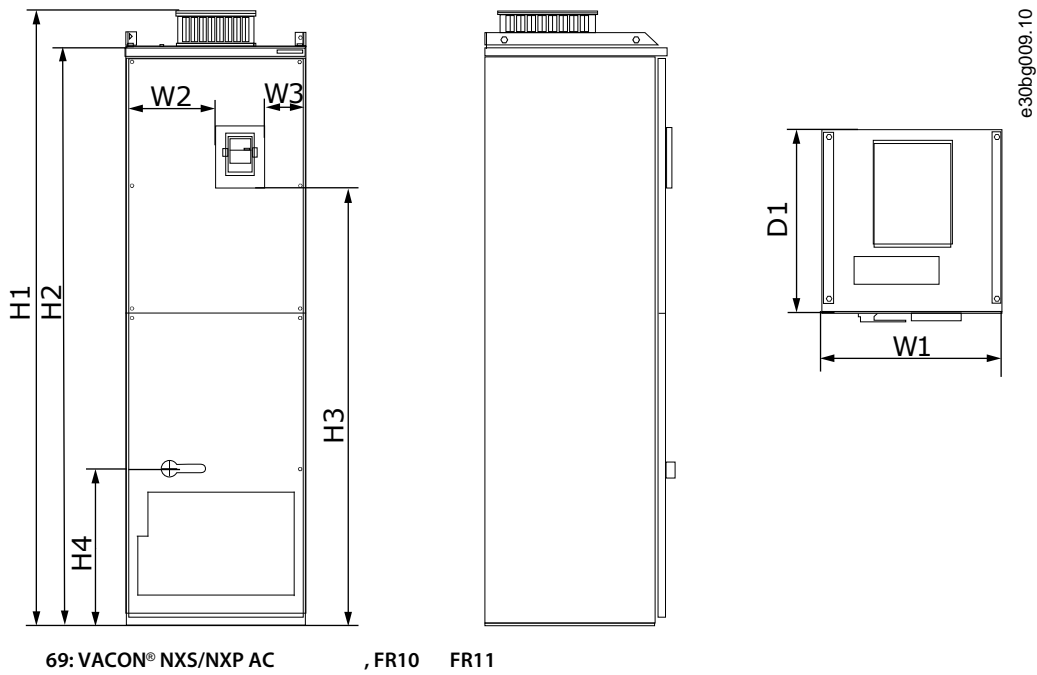
	W1	W2	W3	W4	W5	D1	D2	D3	Ø
0261 2-0300 2	530	510	485	200	5.5	362	340	109	21
0261 5-0300 5	(20.87)	(20.08)	(19.09)	(7.87)	(0.22)	(14.25)	(13.39)	(4.29)	(0.83)
0125 6-0208 6									

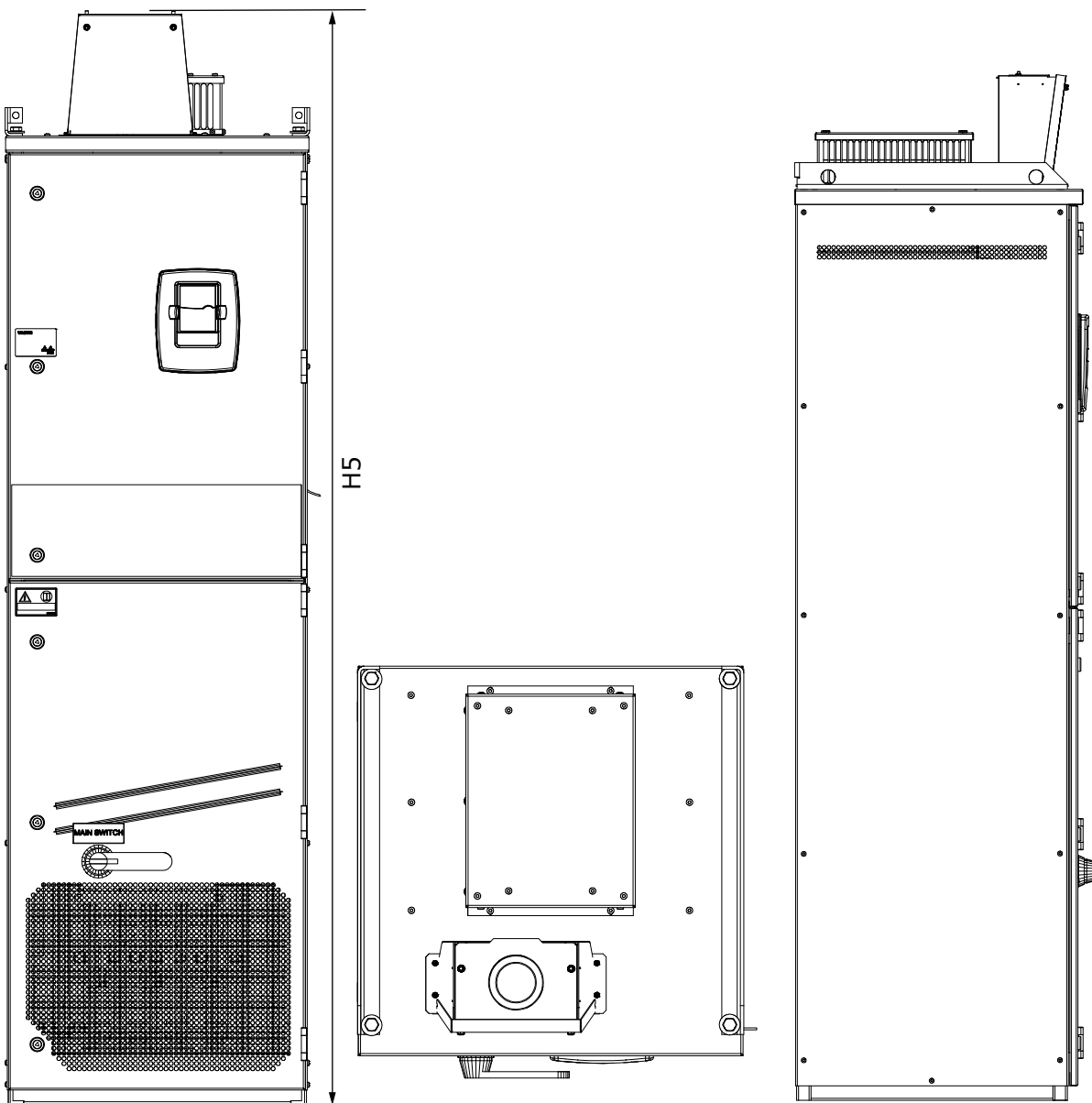
35: VACON® NXS/NXP AC , FR9, 2 (mm (inch))

	H1	H2	H3	H4	H5	H6	H7
0261 2-0300 2	1312	1150	420	100	35	9	2
0261 5-0300 5	(51.65)	(45.28)	(16.54)	(3.94)	(1.38)	(0.35)	(0.08)
0125 6-0208 6							

12.2.4

12.2.4.1 FR10–FR11



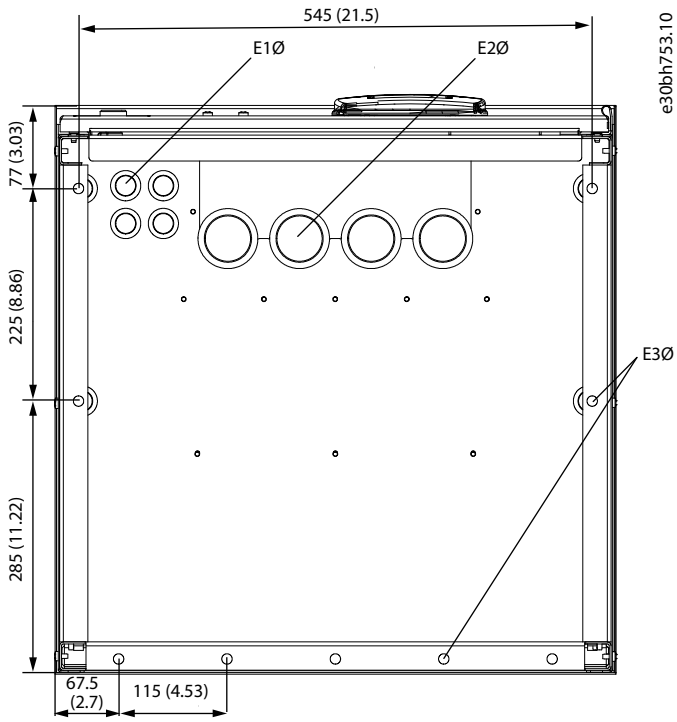


e30bh836.10

70: 가 VACON® NXS/NXP AC , FR10 FR11

36: VACON® NXS/NXP AC , FR10 FR11 (mm (inch))

	W1	W2	W3	H1	H2	H3	H4	H5	D1
• 0385 5-0520 5	595	291	131	2018	1900	1435	512	2139	602
• 0261 6-0416 6	(23.43)	(11.46)	(5.16)	(79.45)	(74.8)	(56.5)	(20.16)	(84.21)	(23.70)
• 0590 5-0730 5	794	390	230	2018	1900	1435	512	2139	602
• 0460 6-0590 6	(31.26)	(15.35)	(9.06)	(79.45)	(74.80)	(56.5)	(20.16)	(84.21)	(23.70)

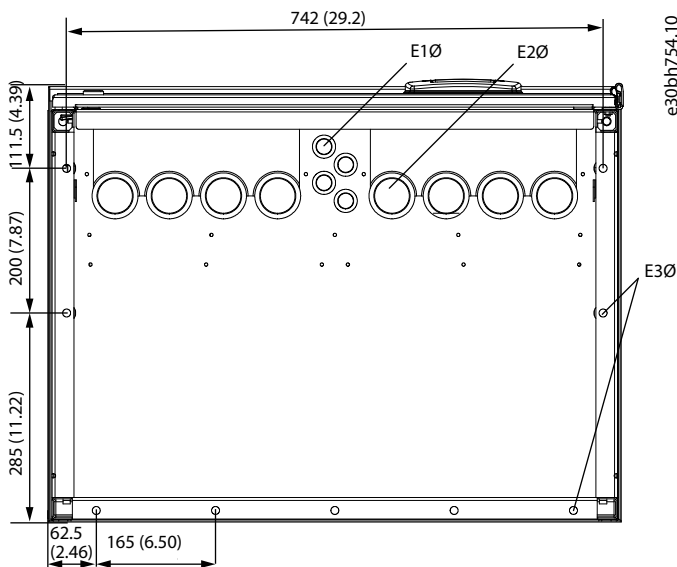


71: VACON® NXS/NXP AC , FR10

37: VACON® NXS/NXP AC , FR10 (mm (inch))

	E1Ø, (1)	E1Ø,	E2Ø, (1)	E2Ø,	E3Ø,
<ul style="list-style-type: none"> <li>• 0385 5-0520 5</li> <li>• 0261 6-0416 6</li> </ul>	4 x 21 (4 x 0.83)	4 x 28 (4 x 1.10)	4 x 48 (4 x 1.89)	4 x 60 (4 x 2.36)	9 x 11 (9 x 0.43)

1 ! 40 mm 360  
3x185+95 mm<sup>2</sup> MCCMK



72: VACON® NXS/NXP AC , FR11

38: VACON® NXS/NXP AC, FR11 (mm (inch))

	E1Ø, (1)	E1Ø,	E2Ø, (1)	E2Ø,	E3Ø,
<ul style="list-style-type: none"> <li>0590 5–0730 5</li> <li>0460 6–0590 6</li> </ul>	4 x 21 (4 x 0.83)	4 x 28 (4 x 1.10)	8 x 48 (8 x 1.89)	8 x 60 (8 x 2.36)	9 x 11 (9 x 0.43)

40 mm 360  
3x185+95 mm<sup>2</sup> MCCMK

12.3

12.3.1

VACON™ NXS NXP Air Cooled AC

gG/gL T/J

- [12.3.2 208–240 V 380–500 V, FR4 ~ FR9](#)
- [12.3.4 525–690 V, FR6 ~ FR9](#)
- [12.3.6 380–500 V, FR10 ~ FR11](#)
- [12.3.8 525–690 V, FR10 ~ FR11](#)

AC

- [12.3.3 208–240 V 380–500 V, FR4 ~ FR9,](#)
- [12.3.5 525–690 V \(UL 600 V\), FR6 ~ FR9,](#)
- [12.3.7 380–500 V, FR10 ~ FR11,](#)
- [12.3.9 525–690 V \(UL 600 V\), FR10 ~ FR11,](#)

12.3.2 208–240 V 380–500 V, FR4 ~ FR9

39: VACON® NXS/NXP

		I <sub>L</sub> [A]	(gG/gL) [A]	Cu <sup>(1)</sup> [mm <sup>2</sup> ]	[mm <sup>2</sup> ]	[mm <sup>2</sup> ]
FR4	0003 2–0008 2 0003 5–0009 5	3–8 3–9	10	3*1.5+1.5	1–4	1–4
	0011 2–0012 2 0012 5	11–12 12	16	3*2.5+2.5	1–4	1–4
FR5	0017 2 0016 5	17 16	20	3*4+4	1–10	1–10
	0025 2 0022 5	25 22	25	3*6+6	1–10	1–10
	0031 2 0031 5	31 31	35	3*10+10	1–10	1–10
FR6	0048 2 0038 5–0045 5	48 38–45	50	3*10+10	2.5–50 Cu 6–50 Al	2.5–35
	0061 2	61	63	3*16+16	2.5–50 Cu 6–50 Al	2.5–35



		$I_L$ [A]	(gG/gL) [A]	$'Cu^{(1)}$ [mm <sup>2</sup> ]	[mm <sup>2</sup> ]	[mm <sup>2</sup> ]
	0061 5					
FR7	0075 2 0072 5	75 72	80	3*25+16	2.5-50 Cu 6-50 Al	6-70
	0088 2 0087 5	88 87	100	3*35+16	2.5-50 Cu 6-50 Al	6-70
	0114 2 0105 5	114 105	125	3*50+25	2.5-50 Cu 6-50 Al	6-70
FR8	0140 2 0140 5	140	160	3*70+35	25-95 Cu/Al	6-95
	0170 2 0168 5	168	200	3*95+50	95-185 Cu/Al	6-95
	0205 2 0205 5	205	250	3*150+70	95-185 Cu/Al	6-95
FR9	0261 2 0261 5	261	315	3*185+95    2*(3*120+70)	95-185 Cu/Al	6-95
	0300 2 0300 5	300	315	2*(3*120+70)	95-185 Cu/Al	6-95

<sup>1</sup> 0.7

12.3.3 208-240 V 380-500 V, FR4 ~ FR9,  
40: VACON® NXS/NXP,

		(T/J) [A]	$'Cu$ [AWG] <sup>(1)(2)</sup>	[AWG]	[AWG]
FR4	0003 2-0008 2 0003 5-0007 5	10	3*16 AWG + 16 AWG	18 AWG - 4 AWG	18 AWG - 4 AWG
	0009 5	15	3*16 AWG + 16 AWG	18 AWG - 4 AWG	18 AWG - 4 AWG
	0011 2-0012 2 0012 5	15	3*14 AWG + 14 AWG	18 AWG - 4 AWG	18 AWG - 4 AWG
FR5	0017 2 0016 5	20	3*12 AWG + 12 AWG	18 AWG - 8 AWG	18 AWG - 8 AWG
	0025 2 0022 5	30	3*10 AWG + 10 AWG	18 AWG - 8 AWG	18 AWG - 8 AWG
	0031 2 0031 5	40	3*8 AWG + 8 AWG	18 AWG - 8 AWG	18 AWG - 8 AWG

		(T/J) [A]	Cu [AWG] <sup>(1)(2)</sup>	[AWG]	[AWG]
FR6	0038 5	50	3*8 AWG + 8 AWG	14 AWG - 1 AWG Cu 10 AWG - 1 AWG Al	14 AWG - 2 AWG
	0048 2 0045 5	60	3*8 AWG + 8 AWG	14 AWG - 1 AWG Cu 10 AWG - 1 AWG Al	14 AWG - 2 AWG
	0061 2 0061 5	90	3*6 AWG + 6 AWG	14 AWG - 1 AWG Cu 10 AWG - 1 AWG Al	14 AWG - 2 AWG
FR7	0075 2 0072 5	90	3*4 AWG + 6 AWG	14 AWG - 1 AWG Cu 10 AWG - 1 AWG Al	10 AWG - 2/0 AWG
	0088 2 0087 5	110	3*2 AWG + 6 AWG	14 AWG - 1 AWG Cu 10 AWG - 1 AWG Al	10 AWG - 2/0 AWG
	0114 2 0105 5	150	3*2 AWG + 4 AWG	14 AWG - 1 AWG Cu 10 AWG - 1 AWG Al	10 AWG - 2/0 AWG
FR8	0140 2 0140 5	175	3*2/0 AWG + 2 AWG	4 AWG - 3/0 AWG Cu/Al	10 AWG - 3/0 AWG
	0170 2 0168 5	250	3*3/0 AWG + 1/0 AWG	3/0 AWG - 350 kcmil Cu/Al	10 AWG - 3/0 AWG
	0205 2 0205 5	250	3*300 kcmil + 2/0 AWG	3/0 AWG - 350 kcmil Cu/Al	10 AWG - 3/0 AWG
FR9	0261 2 0261 5	350	3*350 kcmil + 3/0 AWG 2*(3*250 kcmil + 2/0 AWG)	3/0 AWG - 350 kcmil Cu/Al	10 AWG - 3/0 AWG
	0300 2 0300 5	400	2*(3*250 kcmil + 2/0 AWG)	3/0 AWG - 350 kcmil Cu/Al	10 AWG - 3/0 AWG

<sup>1</sup> 0.7

<sup>2</sup> UL +90 °C (194 °F)

### 12.3.4 525–690 V, FR6 ~ FR9

41: VACON® NXS/NXP

		I <sub>L</sub> [A]	(gG/gL) [A]	Cu <sup>(1)</sup> [mm <sup>2</sup> ]	[mm <sup>2</sup> ]	[mm <sup>2</sup> ]
FR6	0004 6–0007 6	3–7	10	3*2.5+2.5	2.5–50 Cu 6–50 Al	2.5–35
	0010 6–0013 6	10–13	16	3*2.5+2.5	2.5–50 Cu 6–50 Al	2.5–35
	0018 6	18	20	3*4+4	2.5–50 Cu	2.5–35

		$I_L$ [A]	(gG/gL) [A]	$Cu^{(1)}$ [mm <sup>2</sup> ]	[mm <sup>2</sup> ]	[mm <sup>2</sup> ]
					6-50 Al	
	0022 6	22	25	3*6+6	2.5-50 Cu 6-50 Al	2.5-35
	0027 6-0034 6	27-34	35	3*10+10	2.5-50 Cu 6-50 Al	2.5-35
FR7	0041 6	41	50	3*10+10	2.5-50 Cu 6-50 Al	6-50
	0052 6	52	63	3*16+16	2.5-50 Cu 6-50 Al	6-50
FR8	0062 6-0080 6	62-80	80	3*25+16	25-95 Cu/Al	6-95
	0100 6	100	100	3*35+16		
FR9	0125 6-0144 6	125-144	160	3*95+50	95-185 Cu/Al	6-95
	0170 6	170	200			
	0208 6	208	250	3*150+70		

<sup>1</sup> 0.7

12.3.5 525-690 V (UL 600 V), FR6 ~ FR9,  
42: VACON® NXS/NXP, UL 525-600 V

		(T/J) [A]	$Cu$ [AWG] <sup>(1)(2)</sup>	[AWG]	[AWG]
FR6	0004 6-0007 6	10	3*14 AWG + 14 AWG	14 AWG - 1 AWG Cu 10 AWG - 1 AWG Al	14 AWG - 2 AWG
	0010 6	15	3*14 AWG + 14 AWG	14 AWG - 1 AWG Cu 10 AWG - 1 AWG Al	14 AWG - 2 AWG
	0013 6	20	3*14 AWG + 14 AWG	14 AWG - 1 AWG Cu 10 AWG - 1 AWG Al	14 AWG - 2 AWG
	0018 6	25	3*12 AWG + 12 AWG	14 AWG - 1 AWG Cu 10 AWG - 1 AWG Al	14 AWG - 2 AWG
	0022 6	30	3*10 AWG + 10 AWG	14 AWG - 1 AWG Cu 10 AWG - 1 AWG Al	14 AWG - 2 AWG
	0027 6	40	3*8 AWG + 8 AWG	14 AWG - 1 AWG Cu 10 AWG - 1 AWG Al	14 AWG - 2 AWG
	0034 6	50	3*8 AWG + 8 AWG	14 AWG - 1 AWG Cu 10 AWG - 1 AWG Al	14 AWG - 2 AWG

		(T/J) [A]	Cu [AWG] <sup>(1)(2)</sup>	[AWG]	[AWG]
FR7	0041 6	50	3*8 AWG + 8 AWG	14 AWG - 1 AWG Cu 10 AWG - 1 AWG Al	10 AWG - 1 AWG
	0052 6	70	3*6 AWG + 6 AWG	14 AWG - 1 AWG Cu 10 AWG - 1 AWG Al	10 AWG - 1 AWG
FR8	0062 6	80	3*4 AWG + 6 AWG	4 AWG - 3/0 AWG Cu/Al	10 AWG - 3/0 AWG
	0080 6	100	3*4 AWG + 6 AWG	4 AWG - 3/0 AWG Cu/Al	10 AWG - 3/0 AWG
	0100 6	125	3*2 AWG + 6 AWG	4 AWG - 3/0 AWG Cu/Al	10 AWG - 3/0 AWG
FR9	0125 6-0144 6	200	3*3/0 AWG + 1/0 AWG	3/0 AWG - 350 kcmil Cu/Al	10 AWG - 3/0 AWG
	0170 6	250	3*3/0 AWG + 1/0 AWG	3/0 AWG - 350 kcmil Cu/Al	10 AWG - 3/0 AWG
	0208 6	300	3*300 kcmil + 2/0 AWG	3/0 AWG - 350 kcmil Cu/Al	10 AWG - 3/0 AWG

<sup>1</sup> 0.7

<sup>2</sup> UL +90 °C (194 °F)

### 12.3.6 380–500 V, FR10 ~ FR11

!FR10 FR11 aR 가  
FR10 FR11 gG T/J

#### 43: VACON® NXS/NXP

		I <sub>L</sub> [A]	(gG/gL) [A]	<sup>(1)</sup> [mm <sup>2</sup> ]		
FR10	0385 5	385	400 (3 )	Cu: 2*(3*120+70) Al: 2*(3*185Al+57Cu)	/	/
	0460 5	460	500 (3 )	Cu: 2*(3*150+70)	/	/
	0520 5	520	630 (3 )	Cu: 2*(3*185+95)	/	/
FR11	0590 5	590	315 (6 )	Cu: 2*(3*95+50) Al: 4*(3*120Al+41Cu)		/
	0650 5	650	400 (6 )	Cu: 4*(3*95+50) Al: 4*(3*150Al+41Cu)		/
	0730 5	730	400 (6 )	Cu: 4*(3*120+70) Al: 4*(3*185Al+57Cu)		/

<sup>1</sup> 0.7

### 12.3.7 380–500 V, FR10 ~ FR11,

!FR10 FR11 aR 가  
FR10 FR11 gG T/J

44: VACON® NXS/NXP,

		(T/J) [A]	(1)(2)	Cu [AWG]		
FR10	0385 5	500 (3 )		Cu: 2*(3*250 kcmil + 2/0 AWG) Al: 2*(3*350 kcmil Al + 1/0 AWG Cu)	/	/
	0460 5	600 (3 )		Cu: 2*(3*300 kcmil + 2/0 AWG)	/	/
	0520 5	700 (3 )		Cu: 2*(3*350 kcmil + 3/0 AWG)	/	/
FR11	0590 5	400 (6 )		Cu: 2*(3*500 kcmil + 250 kcmil) Al: 4*(3*250 kcmil Al + 1 AWG Cu)		/
	0650 5	400 (6 )		Cu: 4*(3*3/0 AWG + 1/0 AWG) Al: 4*(3*300 kcmil Al + 1 AWG Cu)		/
	0730 5	500 (6 )		Cu: 4*(3*300 kcmil + 2/0 AWG) Al: 4*(3*350 kcmil Al + 1/0 AWG Cu)		/

<sup>1</sup> 0.7

<sup>2</sup> UL +90 °C (194 °F)

12.3.8 525–690 V, FR10 ~ FR11

!FR10 FR11 aR 가  
FR10 FR11 gG T/J

45: VACON® NXS/NXP

		I <sub>L</sub> [A]	(gG/gL) [A]	(1) [mm <sup>2</sup> ]		
FR10	0261 6	261	315 (3 )	Cu: 3*185+95 Al: 2*(3*95Al+29Cu)	/	/
	0325 6	325	400 (3 )	Cu: 2x(3*95 + 50) Al: 2*(3*150Al+41Cu)	/	/
	0385 6	385	400 (3 )	Cu: 2*(3*120+70) Al: 2*(3*185Al+57Cu)	/	/
	0416 6	416	500 (3 )	Cu: 2*(3*150+70) Al: 2*(3*185Al+57Cu)	/	/
FR11	0460 6	460	500 (3 )	Cu: 2*(3*150+70) Al: 2*(3*240Al+72Cu)	/	/
	0502 6	502	630 (3 )	Cu: 2*(3*185+95) Al: 4x(3x95+29)	/	/
	0590 6	590	315 (6 )	Cu: 2*(3*240+120) Al: 4*(3*120Al+41Cu)		/

<sup>1</sup> 0.7

12.3.9 525–690 V (UL 600 V), FR10 ~ FR11,

!FR10 FR11  
FR10 FR11

aR 가

gG T/J

46: VACON® NXS/NXP, UL 525–600 V

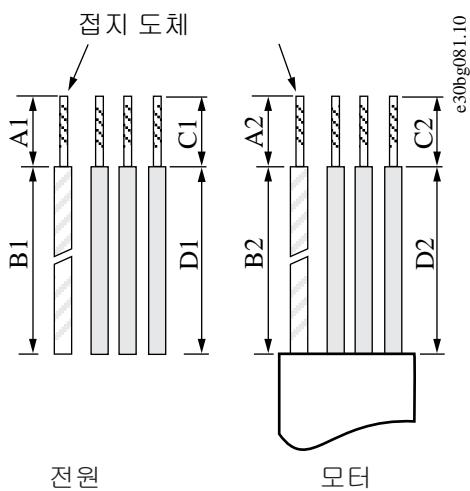
		(T/J) [A]	(2)	Cu <sup>(1)</sup> [AWG]		
FR10	0261 6	350 (3 )	Cu: 3*350 kcmil + 3/0 AWG Al: 2*(3*3/0 AWG Al + 2 AWG Cu)	/	/	
	0325 6	400 (3 )	Cu: 2*(3*3/0 AWG + 1/0 AWG) Al: 2*(3*300 kcmil Al + 1 AWG Cu)	/	/	
	0385 6	500 (3 )	Cu: 2*(3*250 kcmil + 2/0 AWG) Al: 2*(3*350 kcmil Al + 1/0 AWG Cu)	/	/	
	0416 6	500 (3 )	Cu: 2*(3*300 kcmil + 2/0 AWG) Al: 2*(3*350 kcmil Al + 1/0 AWG Cu)	/	/	
FR11	0460 6	600 (3 )	Cu: 2*(3*300 kcmil + 2/0 AWG) Al: 2*(3*500 kcmil Al + 2/0 AWG Cu)	/	/	
	0502 6	700 (3 )	Cu: 2*(3*350 kcmil + 3/0 AWG) Al: 4x(3x3/0AWG)	/	/	
	0590 6	400 (6 )	Cu: 2*(3*500 kcmil + kcmil250) Al: 4*(3*250 kcmil Al + 1 AWG Cu)		/	

<sup>1</sup> UL +90 °C (194 °F)

<sup>2</sup> 0.7

12.4

73



73:

47: [mm]

	A1	B1	C1	D1	A2	B2	C2	D2
FR4	15	35	10	20	7	50	7	35
FR5	20	40	10	30	20	60	10	40
FR6	20	90	15	60	20	90	15	60
FR7	25	120	25	120	25	120	25	120
FR8, 0140	23	240	23	240	23	240	23	240
FR8, 0168-0205	28	240	28	240	28	240	28	240
FR9	28	295	28	295	28	295	28	295

48: [in]

	A1	B1	C1	D1	A2	B2	C2	D2
FR4	0.59	1.38	0.39	0.79	0.28	1.97	0.28	1.38
FR5	0.79	1.57	0.39	1.18	0.79	2.36	0.79	1.57
FR6	0.79	3.54	0.59	2.36	0.79	3.54	0.59	2.36
FR7	0.98	4.72	0.98	4.72	0.98	4.72	0.98	4.72
FR8, 0140	0.91	9.45	0.91	9.45	0.91	9.45	0.91	9.45
FR8, 0168-0205	1.10	9.45	1.10	9.45	1.10	9.45	1.10	9.45
FR9	1.10	11.61	1.10	11.61	1.10	11.61	1.10	11.61

## 12.5

	(Nm)	AC	(Nm)
FR4/FI4 IP54	2.2		0.7
FR5 IP21/ IP54	2.2		0.7
FR6/FI6 IP21/ IP54	2.2		0.7
FR7/FI7 IP21/ IP54	2.4		0.8
FR8/FI8 IP54	0.8 Nm <sup>(1)</sup>		0.8
FR9	0.8		0.8

1

	(Nm)
FR10	4.2

	(Nm)
FR11	4.2

## 12.6

49:

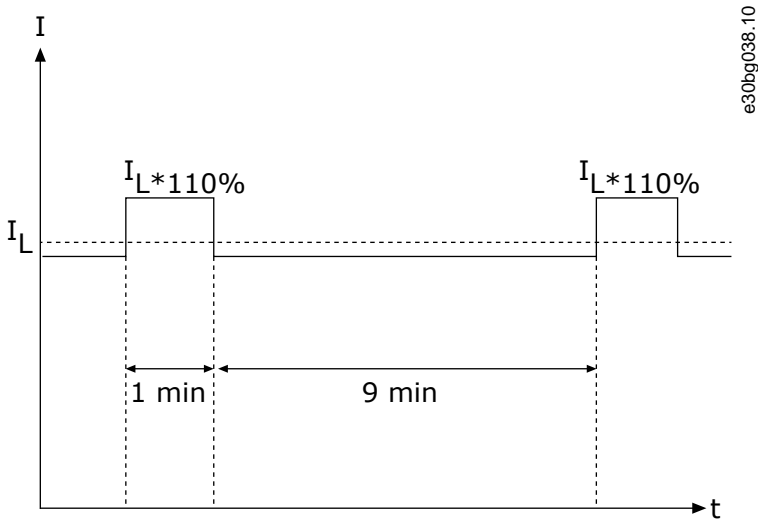
		(Nm)	(lb-in.)
FR4	0004 2-0012 2 0003 5-0012 5	0.5-0.6	4.5-5.3
FR5	0017 2-0031 2 0016 5-0031 5	1.2-1.5	10.6-13.3
FR6	0048 2-0061 2 0038 5-0061 5 0004 6-0034 6	10	88.5
FR7	0075 2-0114 2 0072 5-0105 5 0041 6-0052 6	10	88.5
FR8	0168 2-0205 2 0168 5-0205 5	40	354
FR9	0261 2-0300 2 0261 5-0300 5 0125 6-0208 6	40	354
FR10	0385 5-0520 5 0261 6-0416 6	40	354
FR11	0590 5-0730 5 0460 6-0590 6	40	354

## 12.7

### 12.7.1

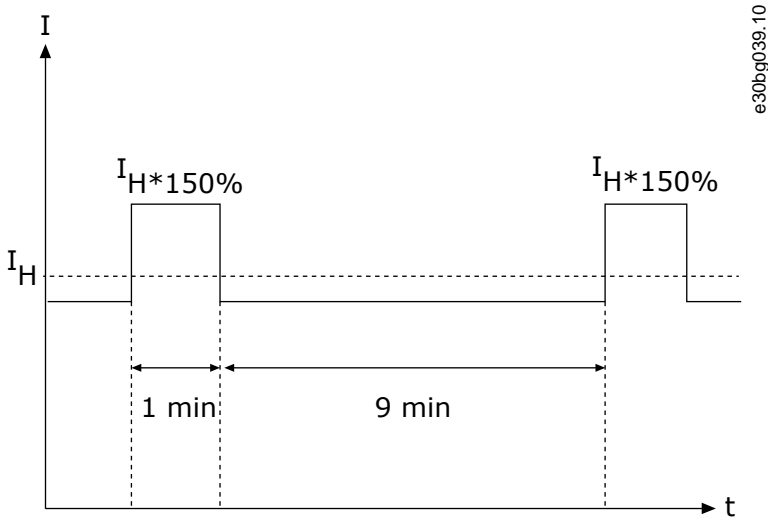
10 1 (I<sub>L</sub>) 110%가 , 9 I<sub>L</sub> 98%  
가 I<sub>L</sub>





74:

10 1 가  $I_H$  (1H) 150%가 , 9  $I_H$  92%



75:

IEC61800-2

### 12.7.2 208–240 V

50: 208–240 V, 50 Hz, 3~

		$I_{in}^{(1)}$	$I_L [A]^{(2)}$	10%	$I_H [A]^{(2)}$	50%	$I_5 2 s$	<sup>(3)</sup> : 10%	<sup>(3)</sup> : 50%
				I [A]	I [A]	40°C [kW]		50°C [kW]	
FR4	0003	3.7	3.7	4.1	2.4	3.6	4.8	0.55	0.37
	0004	4.8	4.8	5.3	3.7	5.6	7.4	0.75	0.55
	0007	6.6	6.6	7.3	4.8	7.2	9.6	1.1	0.75
	0008	7.8	7.8	8.6	6.6	9.9	13.2	1.5	1.1

		$I_{in}^{(1)}$	$I_L [A]^{(2)}$	10% I [A]	$I_H [A]^{(2)}$	50% I [A]	$I_S 2 s$	<sup>(3)</sup> : 10% 40°C [kW]	<sup>(3)</sup> : 50% 50°C [kW]
	0011	11	11.0	12.1	7.8	11.7	15.6	2.2	1.5
	0012	12.5	12.5	13.8	11.0	16.5	22.0	3.0	2.2
FR5	0017	17.5	17.5	19.3	12.5	18.8	25.0	4.0	3.0
	0025	25	25	27.5	17.5	26.3	35.0	5.5	4.0
	0031	31	31	34.1	25.0	37.5	50.0	7.5	5.5
FR6	0048	48	48	52.8	31.0	46.5	62.0	11.0	7.5
	0061	61	61.0	67.1	48.0	72.0	96.0	15.0	11.0
FR7	0075	75	75.0	83.0	61.0	92.0	122.0	22.0	15.0
	0088	88	88.0	97.0	75.0	113.0	150.0	22.0	22.0
	0114	114	114.0	125.0	88.0	132.0	176.0	30.0	22.0
FR8	0140	140	140.0	154.0	105.0	158.0	210.0	37.0	30.0
	0170	170	170.0	187.0	140.0	210.0	280.0	45.0	37.0
	0205	205	205.0	226.0	170.0	255.0	340.0	55.0	45.0
FR9	0261	261	261.0	287.0	205.0	308.0	410.0	75.0	55.0
	0300	300	300.0	330.0	245.0	368.0	490.0	90.0	75.0

<sup>1</sup> 가

<sup>2</sup> [12.7.1](#)

<sup>3</sup> 230 V

### 12.7.3 208–240 V

51: 208–240 V, 60 Hz, 3~

		$I_{in}^{(1)}$	$I_L [A]^{(2)}$	10% I [A]	$I_H [A]^{(2)}$	50% I [A]	$I_S 2 s$	<sup>(3)</sup> : 10% 104°F [hp]	<sup>(3)</sup> : 50% 122°F [hp]
FR4	0003	3.7	3.7	4.1	2.4	3.6	4.8	0.75	0.5
	0004	4.8	4.8	5.3	3.7	5.6	7.4	1	0.75
	0007	6.6	6.6	7.3	4.8	7.2	9.6	1.5	1
	0008	7.8	7.8	8.6	6.6	9.9	13.2	2	1.5

		$I_{in}^{(1)}$	$I_L [A]^{(2)}$	10% I [A]	$I_H [A]^{(2)}$	50% I [A]	$I_S 2 s$	<sup>(3)</sup> : 10% 104°F [hp]	<sup>(3)</sup> : 50% 122°F [hp]
	0011	11	11.0	12.1	7.8	11.7	15.6	3	2
	0012	12.5	12.5	13.8	11.0	16.5	22.0	4	3
FR5	0017	17.5	17.5	19.3	12.5	18.8	25.0	5	4
	0025	25	25	27.5	17.5	26.3	35.0	7.5	5
	0031	31	31	34.1	25.0	37.5	50.0	10	7.5
FR6	0048	48	48	52.8	31.0	46.5	62.0	15	10
	0061	61	61.0	67.1	48.0	72.0	96.0	20	15
FR7	0075	75	75.0	83.0	61.0	92.0	122.0	25	20
	0088	88	88.0	97.0	75.0	113.0	150.0	30	25
	0114	114	114.0	125.0	88.0	132.0	176.0	40	30
FR8	0140	140	140.0	154.0	105.0	158.0	210.0	50	40
	0170	170	170.0	187.0	140.0	210.0	280.0	60	50
	0205	205	205.0	226.0	170.0	255.0	340.0	75	60
FR9	0261	261	261.0	287.0	205.0	308.0	410.0	100	75
	0300	300	300.0	330.0	245.0	368.0	490.0	125	100

<sup>1</sup> 가

<sup>2</sup> [12.7.1](#)

<sup>3</sup> 240 V

### 12.7.4 380–500 V

52: 380–500 V, 50 Hz, 3~

		$I_{in}^{(1)}$	$I_L [A]^{(2)}$	10% I [A]	$I_H [A]^{(2)}$	50% I [A]	$I_S 2 s$	<sup>(3)</sup> : 10% 40°C [kW]	<sup>(3)</sup> : 50% 50°C [kW]
FR4	0003	3.3	3.3	3.6	2.2	3.3	4.4	1.1	0.75
	0004	4.3	4.3	4.7	3.3	5	6.6	1.5	1.1
	0005	5.6	5.6	6.2	4.3	6.5	8.6	2.2	1.5
	0007	7.6	7.6	8.4	5.6	8.4	11.2	3	2.2

		$I_{in}^{(1)}$	$I_L [A]$ (2)	10% $I [A]$	$I_H [A]$ (2)	50% $I [A]$	$I_{5\ 2\ s}$	<sup>(3)</sup> : 10% 40°C [kW]	<sup>(3)</sup> : 50% 50°C [kW]
	0009	9	9	9.9	7.6	11.4	15.2	4	3
	0012	12	12	13.2	9	13.5	18	5.5	4
FR5	0016	16	16	17.6	12	18	24	7.5	5.5
	0022	23	23	25.3	16	24	32	11	7.5
	0031	31	31	34	23	35	44	15	11
FR6	0038	38	38	42	31	47	62	18.5	15
	0045	46	46	49.5	38	57	76	22	18.5
	0061	61	61	67	46	69	92	30	22
FR7	0072	72	72	79	61	92	122	37	30
	0087	87	87	96	72	108	144	45	37
	0105	105	105	116	87	131	174	55	45
FR8	0140	140	140	154	105	158	210	75	55
	0168	170	170	187	140	210	280	90	75
	0205	205	205	226	170	255	340	110	90
FR9	0261	261	261	287.1	205	308	410	132	110
	0300	300	300	330	245	368	490	160	132
FR10 <sup>(3)</sup>	0385	385	385	424	300	450	600	200	160
	0460	460	460	506	385	578	770	250	200
	0520	520	520	576	460	690	920	250	250
FR11 <sup>(3)</sup>	0590	590	590	649	520	780	1040	315	250
	0650	650	650	715	590	885	1180	355	315
	0730	730	730	803	650	975	1300	400	355

<sup>1</sup> 가

<sup>2</sup> [12.7.1](#)

<sup>3</sup> 400 V

12.7.5 380–500 V

53: 380–500 V, 60 Hz, 3~

		$I_{in}^{(1)}$	$I_L^{(2)}$ [A]	10% $I$ [A]	$I_H^{(2)}$ [A]	50% $I$ [A]	$I_S$ 2 s	<sup>(3)</sup> : 10% 104°F [hp]	<sup>(3)</sup> : 50% 122°F [hp]
FR4	0003	3.3	3.3	3.6	2.2	3.3	4.4	2	1.5
	0004	4.3	4.3	4.7	3.3	5	6.6	3	2
	0005	5.6	5.6	6.2	4.3	6.5	8.6	4	3
	0007	7.6	7.6	8.4	5.6	8.4	11.2	5	4
	0009	9	9	9.9	7.6	11.4	15.2	7.5	5
	0012	12	12	13.2	9	13.5	18	10	7.5
FR5	0016	16	16	17.6	12	18	24	13	10
	0022	23	23	25.3	16	24	32	20	13
	0031	31	31	34	23	35	44	25	20
FR6	0038	38	38	42	31	47	62	30	25
	0045	46	46	49.5	38	57	76	40	30
	0061	61	61	67	46	69	92	50	40
FR7	0072	72	72	79	61	92	122	60	50
	0087	87	87	96	72	108	144	75	60
	0105	105	105	116	87	131	174	90	75
FR8	0140	140	140	154	105	158	210	125	90
	0168	170	170	187	140	210	280	150	125
	0205	205	205	226	170	255	340	175	150
FR9	0261	261	261	287.1	205	308	410	200	175
	0300	300	300	330	245	368	490	250	200
FR10 <sup>(3)</sup>	0385	385	385	424	300	450	600	350	250
	0460	460	460	506	385	578	770	400	350
	0520	520	520	576	460	690	920	450	400
FR11 <sup>(3)</sup>	0590	590	590	649	520	780	1040	500	450

		$I_{in}^{(1)}$	$I_L [A]^{(2)}$	10% $I [A]$	$I_H [A]^{(2)}$	50% $I [A]$	$I_S 2 s$	<sup>(3)</sup> : 10% 104°F [hp]	<sup>(3)</sup> : 50% 122°F [hp]
	0650	650	650	715	590	885	1180	600	500
	0730	730	730	803	650	975	1300	650	600

<sup>1</sup> 가

<sup>2</sup> [12.7.1](#)

<sup>3</sup> 480 V

### 12.7.6 525–690 V (UL 600 V)

54: 525–600 V, 50 Hz, 3~

		$I_{in}^{(1)}$	$I_L [A]^{(2)}$	10% $I [A]$	$I_H [A]^{(2)}$	50% $I [A]$	$I_S 2 s$	<sup>(3)</sup> : 10% 40°C [kW]	<sup>(3)</sup> : 50% 50°C [kW]
FR6	0004	4.5	4.5	5.0	3.2	4.8	6.4	3.0	2.2
	0005	5.5	5.5	6.1	4.5	6.8	9.0	4.0	3.0
	0007	7.5	7.5	8.3	5.5	8.3	11.0	5.5	4.0
	0010	10.0	10.0	11.0	7.5	11.3	15.0	7.5	5.5
	0013	13.5	13.5	14.9	10.0	15.0	20.0	11.0	7.5
	0018	18.0	18	19.8	13.5	20.3	27.0	15.0	11.0
	0022	22.0	22.0	24.2	18.0	27.0	36.0	18.5	15.0
	0027	27.0	27.0	29.7	22.0	33.0	44.0	22.0	18.5
	0034	34.0	34.0	37.0	27.0	41.0	54.0	30.0	22.0
FR7	0041	41.0	41.0	45.0	34.0	51.0	68.0	37.5	30.0
	0052	52.0	52.0	57.0	41.0	62.0	82.0	45.0	37.5
FR8	0062	62.0	62.0	68.0	52.0	78.0	104.0	55.0	45.0
	0080	80.0	80.0	88.0	62.0	93.0	124.0	75.0	55.0
	0100	100.0	100.0	110.0	80.0	120.0	160.0	90.0	75.0
FR9	0125	125.0	125.0	138.0	100.0	150.0	200.0	110.0	90.0
	0144	144.0	144.0	158.0	125.0	188.0	250.0	132.0	110.0
	0170	170.0	170.0	187.0	144.0	216.0	288.0	160.0	132.0

		$I_{in}^{(1)}$	$I_L [A]^{(2)}$	10% $I [A]$	$I_H [A]^{(2)}$	50% $I [A]$	$I_5 2 s$	<sup>(3)</sup> : 10% 40°C [kW]	<sup>(3)</sup> : 50% 50°C [kW]
	0208	208.0	208.0	229.0	170.0	255.0	340.0	200.0	160.0
FR10 <sup>(3)</sup>	0261	261.0	261.0	287.0	208.0	312.0	416.0	250.0	200.0
	0325	325.0	325.0	358.0	261.0	392.0	522.0	315.0	250.0
	0385	385.0	385.0	424.0	325.0	488.0	650.0	355.0	315.0
	0416	416.0	416.0	358.0	325.0	488.0	650.0	400.0	315.0
FR11 <sup>(3)</sup>	0460	460.0	460.0	506.0	385.0	578.0	770.0	450.0	355.0
	0502	502.0	502.0	552.0	460.0	690.0	920.0	500.0	450.0
	0590	590.0	590.0	649.0	502.0	753.0	1004.0	560.0	500.0

<sup>1</sup> 가

<sup>2</sup> [12.7.1](#)

<sup>3</sup> 690 V

12.7.7 525–690 V (UL 600 V),

55: 525–600 V, 60 Hz, 3~

		$I_{in}^{(1)}$	$I_L [A]^{(2)}$	10% $I [A]$	$I_H [A]^{(2)}$	50% $I [A]$	$I_5 2 s$	<sup>(3)</sup> : 10% 104°F [hp]	<sup>(3)</sup> : 50% 122°F [hp]
FR6	0004	4.5	4.5	5.0	3.2	4.8	6.4	3	2
	0005	5.5	5.5	6.1	4.5	6.8	9.0	4	3
	0007	7.5	7.5	8.3	5.5	8.3	11.0	5	4
	0010	10.0	10.0	11.0	7.5	11.3	15.0	7.5	5
	0013	13.5	13.5	14.9	10.0	15.0	20.0	10	7.5
	0018	18.0	18	19.8	13.5	20.3	27.0	15	10
	0022	22.0	22.0	24.2	18.0	27.0	36.0	20	15
	0027	27.0	27.0	29.7	22.0	33.0	44.0	25	20
	0034	34.0	34.0	37.0	27.0	41.0	54.0	30	25
FR7	0041	41.0	41.0	45.0	34.0	51.0	68.0	40	30
	0052	52.0	52.0	57.0	41.0	62.0	82.0	50	40

		$I_{in}^{(1)}$	$I_L [A]^{(2)}$	10% $I [A]$	$I_H [A]^{(2)}$	50% $I [A]$	$I_s$ 2 s	<sup>(3)</sup> : 10% 104°F [hp]	<sup>(3)</sup> : 50% 122°F [hp]
FR8	0062	62.0	62.0	68.0	52.0	78.0	104.0	60	50
	0080	80.0	80.0	88.0	62.0	93.0	124.0	75	60
	0100	100.0	100.0	110.0	80.0	120.0	160.0	100	75
FR9	0125	125.0	125.0	138.0	100.0	150.0	200.0	125	100
	0144	144.0	144.0	158.0	125.0	188.0	250.0	150	125
	0170	170.0	170.0	187.0	144.0	216.0	288.0	150	150
	0208	208.0	208.0	229.0	170.0	255.0	340.0	200	150
FR10 <sup>(3)</sup>	0261	261.0	261.0	287.0	208.0	312.0	416.0	250	200
	0325	325.0	325.0	358.0	261.0	392.0	522.0	350	250
	0385	385.0	385.0	424.0	325.0	488.0	650.0	400	350
	0416	416.0	416.0	358.0	325.0	488.0	650.0	450	350
FR11 <sup>(3)</sup>	0460	460.0	460.0	506.0	385.0	578.0	770.0	500	450
	0502	502.0	502.0	552.0	460.0	690.0	920.0	550	500
	0590	590.0	590.0	649.0	502.0	753.0	1004.0	600	550

<sup>1</sup> 가

<sup>2</sup> [12.7.1](#)

<sup>3</sup> 575 V

## 12.8 VACON® NXP

56:

	$U_{in}$	208–240 V, 380–500 V, 525–690 V, UL	600 V, -10%...+10%
		45–66 Hz	
		1	
		2 s (FR4 ~ FR8), 5 s (FR9)	
		±3%	
		: TN, TT IT	:
		< 100 kA	.



		0-U <sub>in</sub>
		$I_L$ : +40 °C (104 °F) 1.1 x $I_L$ (1 /10 ) $I_H$ : +50 °C (122 °F) 1.5 x $I_H$ (1 /10 ) 가 50-55 °C (122-131 °F) , 2.5% / 1 °C (°F) .
		20 2 IS. 2 가 150% $I_H$
		0-320 Hz ( VACON® NXP NXS); 7200 Hz ( 가 NXP)
		0.01 Hz (VACON® NXS); (VACON® NXP)
		U/f, (VA- CON® NXP )
	( P2.6.9 )	208-240 V 380-500 V, 0061: 1-16 kHz : 6 kHz 208-240 V, 0075 : 1-10 kHz : 3.6 kHz 380-500 V, 0072 : 1-6 kHz : 3.6 kHz 525-690 V: 1-6 kHz : 1.5 kHz
		0.1% (VACON® NXP: 12 ), ±1% 0.01 Hz
		8-320 Hz
	가	0.1-3000 s
		0.1-3000 s
		: 30% * TN ( )
		<b>FR4-FR9 <math>I_L</math> :</b> -10 °C (-14 °F) ( )...+40 °C (104 °F) $I_H$ : -10 °C (-14 °F) ( )...+50 °C (122 °F) <b>FR10-FR11 (IP21/UL 1)</b> $I_H/I_L$ : -10 °C (-14 °F) ( )...+40 °C (104 °F) ( - 525-690 V, 0461 0590: -10 °C (-14 °F) ( )... +35 °C (95 °F)) <b>FR10 (IP54/UL 12)</b> $I_H/I_L$ : -10 °C (-14 °F) ( )...+40 °C (104 °F) ( - 380-500 V, 0520 525-690 V, 0416: -10 °C (-14 °F) ( )...+35 °C (95 °F)) 가 - .
		-40 °C (-104 °F)...+70 °C (158 °F)

		0-95% RH,
		<p>100% ( ) 1000 m (3281 ft), 1000 m (3281 ft) 100 m (328 ft) 1%</p> <p>:</p> <ul style="list-style-type: none"> <li>FR4-FR8:                     <ul style="list-style-type: none"> <li>208-240 V: 3000 m (9843 ft) (TN, TT, IT *)</li> <li>380-500 V: 3000 m (9843 ft) (TN, TT IT )</li> <li>525-690 V: 2000 m (6562 ft) (TN, TT IT )</li> </ul> </li> <li>FR9-FR11:                     <ul style="list-style-type: none"> <li>208-240 V: 3000 m (9843 ft) (TN, TT, IT *)</li> <li>380-500 V: 3000 m (9843 ft) (TN, TT IT )</li> <li>380-500 V: 2000 m (6562 ft) ( **)</li> <li>525-690 V: 2000 m (6562 ft) (TN, TT IT )</li> </ul> </li> </ul> <p>* FR4-FR9 ( 208-240 V ) 3000 m ( <a href="#">6.2.1</a> ).</p> <p>** FR9-FR11 ( 380-500 V ) 2000 m ( <a href="#">6.2.1</a> ).</p>
	:	<ul style="list-style-type: none"> <li>IEC 60721-3-3, AC , 3C2</li> <li>IEC 60721-3-3, AC , 3S2</li> </ul> <p>3C3 .</p>
	IEC/EN 60068-2-6 IEC/EN 61800-5-1	<p>5-150 Hz</p> <p>1 mm ( ), 5-15.8 Hz (FR4-FR9)</p> <p>가 1 G, 15.8-150 Hz (FR4-FR9)</p> <p>0.25 mm ( ), 5-31 Hz (FR10-FR11)</p> <p>가 0.25 G, 31-150 Hz (FR10-FR11)</p>
	IEC/EN 60068-2-27	UPS ( UPS ) : 15 G, 11 ms( )
		<p>IP21 (UL 1), kW/HP (FR4-FR9 and FR10-FR11 Standalone)</p> <p>IP54 (UL 12), FR4- FR9 FR10 . IP54 (UL 12)</p> <p>가 .</p>
		PD2
EMC ( )		<p>:</p> <p><math>R_{SCE} &gt; 120 \text{ } \ln &lt; 75 \text{ A}</math> IEC 61000-3-12</p> <p>:</p> <p>IEC/EN 61800-3 + A1, 1 2</p>
		EMC . <a href="#">2</a> .

	( ), dB(A)	FR4: 44 FR5: 49 FR6-FR7: 57 FR8: 58 FR9-FR11: 76
	가 'Safe Torque Off' STO	<ul style="list-style-type: none"> <li>EN 61800-5-2 Safe Torque Off (STO) SIL3</li> <li>EN ISO 13849-1 PL "e" 3</li> <li>EN 62061 SILCL3</li> <li>IEC 61508 SIL3</li> <li>0, EN 60204-1</li> <li>EN 954-1, 3</li> </ul>
	SS1 EN61800-5-2 C ( C: "PDS(SR) STO "). SS1	<ul style="list-style-type: none"> <li>EN 61800-5-2 1 (SS1) SIL3</li> <li>EN ISO 13849-1 PL "e" 3</li> <li>EN 62061 SILCL3</li> <li>IEC 61508 SIL3</li> <li>1, EN60204-1</li> </ul>
	ATEX	94/9/EC, CE 0537 Ex 11 (2) GD
	-	CE, cULus, RCM, KC, EAC, UA. ( ) : LR, BV, DNVGL, ABS, RMRS, CCS, KR, NK.
	-	<a href="http://ecosmart.danfoss.com/">http://ecosmart.danfoss.com/</a>
( OPTA1, OPTA2 OPTA3 )		0...+10 V, Ri = 200 kΩ, (-10 V...+10 V ) 0.1% (VACON® NXP: 12 , VACON® NXS: 10 ), ±1%
		0(4)-20 mA, Ri = 250 Ω
	(6)	+ - ; 18-30 V DC
		+24 V, ±10%, < 100 mV rms; 250 mA : 1000 mA/ ( )
		+10 V, +3%, 10 mA
		0(4)-20 mA; RL 500 Ω; 10 ; ±2%
		, 50 mA/48 V
		2 가 ( ): 24 VDC/8 A, 250 VAC/8 A, 125 VDC/0.4 A

		: 5 V/10 mA	
		240 V : 437 V DC 500 V : 911 V DC 690 V : 1200 V DC	
		240 V: 183 V DC. 500 V: 333 V DC. 690 V: 461 V DC.	
		, AC	
		가	
		가	
		가 . <sup>(1)</sup>	
		110%	
	+24 V +10 V		
		: • = NCS 7010-R90B (Pantone 7546C) • = NCS S3020-B	

<sup>1</sup> UL 508C  
NXP00002V186

NXS00001V175, NXS00002V177  
UL

## 12.9

### 12.9.1

- [12.9.2](#) 208–240 V
- [12.9.3](#) 380–500 V
- [12.9.4](#) 525–690 V
- [12.9.5](#) , FR4–FR6 (380–500 V)

VACON® NX

12.9.2 208–240 V

57: VACON® NXS/NXSP AC , 208–240 V, 50/60 Hz, 3~

		[Ω]	<sup>(1)</sup> @405 V DC [kW]
FR4	0003	30	0.55
	0004	30	0.75
	0007	30	1.1
	0008	30	1.5
	0011	30	2.2
	0012	30	3.0
FR5	0017	30	4.0
	0025	30	5.5
	0031	20	7.5
FR6	0048	10	11.0
	0061	10	15.0
FR7	0075	3.3	22.0
	0088	3.3	22.0
	0114	3.3	30.0
FR8	0140	1.4	37.0
	0170	1.4	45.0
	0205	1.4	55.0
FR9	0261	1.4	75.0
	0300	1.4	90.0

<sup>1</sup>  $\frac{U_{dc}^2}{R_b}$

12.9.3 380–500 V

58: VACON® NXS/NXP AC , 380–500 V, 50/60 Hz, 3~

		[Ω]	<sup>(1)</sup> @845 V DC [kW]
FR4	0003	63	1.5
	0004	63	2.2

		[Ω]	<sup>(1)</sup> @845 V DC [kW]
	0005	63	3.0
	0007	63	4.0
	0009	63	5.5
	0012	63	7.5
FR5	0016	63	11.0
	0022	63	11.3
	0031	42	17.0
FR6	0038	19	22.0
	0045	19	30.0
	0061	14	37.0
FR7	0072	6.5	45.0
	0087	6.5	55.0
	0105	6.5	75.0
FR8	0140	3.3	90.0
	0168	3.3	110.0
	0205	3.3	132.0
FR9	0261	2.5	160.0
	0300	2.5	200.0
FR10	0385	1.4	250.0
	0460	1.4	315.0
	0520	1.4	355.0
FR11	0590	0.9	400.0
	0650	0.9	450.0
	0730	0.9	500.0

<sup>1</sup>  $P = U_{dc}^2 / R_b$  . DC (Udc) Rb Udc<sup>2</sup>/Rb ,

12.9.4 525–690 V

59: VACON® NXS/NXP AC , 525–690 V, 50/60 Hz, 3~

		[Ω]	<sup>(1)</sup> @1166 V DC [kW]
FR6	0004	100	3.0
	0005	100	4.0
	0007	100	5.5
	0010	100	7.5
	0013	100	11.0
	0018	30	15.0
	0022	30	18.5
	0027	30	22.0
	0034	30	30.0
FR7	0041	18	37.5
	0052	18	45.0
FR8	0062	9	55.0
	0080	9	75.0
	0100	9	90.0
FR9	0125	6.7	110.0
	0144	6.7	132.0
	0170	6.7	160.0
	0208	6.7	194.2
FR10	0261	2.5	250.0
	0325	2.5	315.0
	0385	2.5	355.0
	0416	2.5	400.0
FR11	0460	1.7	450.0
	0502	1.7	500.0

		[Ω]	@1166 V DC [kW] (1)
	0590	1.7	560.0

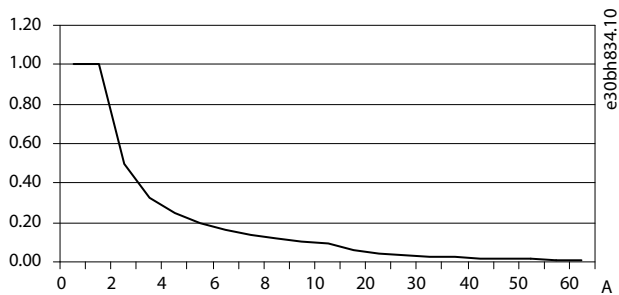
1 DC (Udc) Rb Udc<sup>2</sup>/Rb

### 12.9.5 , FR4–FR6 (380–500 V)

FR4, FR5 FR6(380–500 V)  
(0) 2 1 가

60: , FR4–FR6

	[Ω]	2 [kJ]	1 / [W]
FR4 (380–500 V)	120	4	45
FR5 (380–500 V)	55	8.9	100
FR6 (380–500 V)	30	16	175



A ( )

76:

### 12.10

12.10.1 1 - Overcurrent( ), S1- Hardware trip( )

- 가
- 가
- .
- .
- .
- .
- .
- .
- ID

12.10.2 1 - Overcurrent( ), S2 - Current cutter supervision (VACON® NXS)(  
(VACON® NXS))

가





12.10.6 2 - Overvoltage(     ),     S2 - Overvoltage control supervision(     )

- DC     .
- 
- 
- 
- /
- 
- 가     .
- 
- 

12.10.7 3 - Earth fault(     )

- ,     0     .
- 
- Protections(     )     .

12.10.8 5 - Charging switch(     )

- START(     )     가     .
- 
- 
- 
- 

12.10.9 6 - Emergency stop(     )

가     .

12.10.10 7 - Saturation trip(     )

- 
- 
- 
- 
- !
- 1     ,

12.10.11 8 - System fault( ), S1 - ASIC phase feedback(ASIC )

- 
- 
- 
- 

12.10.12 8 - System fault( ), S4 - ASIC trip(ASIC )

- 
- 
- 
- 

12.10.13 8 - System fault( ), S5 - Disturbance in VaconBus(VaconBus )

- 
- 
- 
- 

12.10.14 8 - System fault( ), S6 - Feedback of charging switch( )

- 
- 
- 
- 

12.10.15 8 - System fault( ), S7 - Charging switch( )

- 
- 
- 
-

12.10.16	8 - System fault( )	),	S8 - No power to driver card(
•			
•			
•			
•			
12.10.17	8 - System fault( (TX))	),	S9 - Power unit communication (TX)(
•			
•			
•			
•			
12.10.18	8 - System fault( ( ))	),	S10 - Power unit communication (Trip)(
•			
•			
•			
•			
12.10.19	8 - System fault( ( ))	),	S11 - Power unit comm. (Measurement)(
•			
•			
•			
•			
12.10.20	8 - System fault( ( D E))	),	S12 - System bus fault (slot D or E)(
	D E	(OPTD1 OPTD2)	
•			
•			
•			
•			
•			



<p>12.10.28 8 - System fault( both STO channels(OPTAF: STO Safe Disable( 가) 가</p> <ul style="list-style-type: none"> <li>• OPTAF</li> <li>•</li> </ul>	<p>), S37 - OPTAF: Test pulse is not detected in 가 )</p>
<p>12.10.29 8 - System fault( STO channel 1(OPTAF: STO 1 Safe Disable( 가) 가</p> <ul style="list-style-type: none"> <li>• OPTAF</li> <li>•</li> </ul>	<p>), S38 - OPTAF: Test pulse is not detected in 가 )</p>
<p>12.10.30 8 - System fault( STO channel 2(OPTAF: STO 2 Safe Disable( 가) 가</p> <ul style="list-style-type: none"> <li>• OPTAF</li> <li>•</li> </ul>	<p>), S39 - OPTAF: Test pulse is not detected in 가 )</p>
<p>12.10.31 8 - System fault( STO channel 1 is active(OPTAF: STO 1 Safe Disable( 가) 가</p> <ul style="list-style-type: none"> <li>• OPTAF</li> <li>•</li> </ul>	<p>), S40 - OPTAF: ASIC trip ETR is not set, even if ASIC ETR )</p>
<p>12.10.32 8 - System fault( when the thermistor trip is active(OPTAF: 가 ) 가</p> <p>OPTAF</p>	<p>), S41 - OPTAF: STO channels are not active STO</p>
<p>12.10.33 8 - System fault( on thermistor(OPTAF: 가</p> <p>OPTAF</p>	<p>), S42 - OPTAF: Test pulse low is not detected )</p>
<p>12.10.34 8 - System fault( on thermistor(OPTAF: 가</p> <p>OPTAF</p>	<p>), S43 - OPTAF: Test pulse high is not detected )</p>

12.10.35 8 - System fault( ), S44 - OPTAF: STO channel 1 is not active, STO  
 even if the analog input supervision indicates it(OPTAF: STO  
 1 가 )

Safe Disable( 가) 가 .

- OPTAF .
- .

12.10.36 8 - System fault( ), S45 - OPTAF: STO channel 2 is not active, STO  
 even if the analog input supervision indicates it(OPTAF: STO  
 2가 가 )

Safe Disable( 가) 가 .

- OPTAF .
- .

12.10.37 8 - System fault( ), S46 - OPTAF: Thermistor or analog input is  
 not set, even if STO is active(OPTAF: STO가  
 )

Safe Disable( 가) 가 .

- OPTAF .
- .

12.10.38 8 - System fault( ), S47 - OPTAF: Board mounted in old NXP  
 control board with no safety hardware(OPTAF: 가 NXP  
 )

Safe Disable( 가) VACON® NXP OPTAF 가 .

VB00561 H .

12.10.39 8 - System fault( ), S48 - OPTAF: Mismatch between Therm Trip  
 (HW) parameter and jumper setting(OPTAF: (HW) )

X12가 Expander boards( )/ SlotB( B)/ Therm Trip(HW)( (HW))  
 OFF( ) .

7.2.1.1 Therm Trip (HW)( (HW)) X12 .

12.10.40 8 - System fault( ), S49 - OPTAF: Board mounted in VACON NXS  
 control board(OPTAF: VACON NXS )

OPTAF VACON® NXP .

OPTAF .

12.10.41	8 - System fault( ) 가 . .	S50 - OPTAF: Filter discharge resistor
12.10.42	8 - System fault( ) .	S70 - False fault activated(
12.10.43	9 - Undervoltage( ) DC . . AC . 가 . . . .	S1 - DC-link too low during run(가 DC Protections( ) .
12.10.44	9 - Undervoltage( ) DC . . AC . 가 . . . .	S2 - No data from power unit( Protection( ) .
12.10.45	9 - Undervoltage( ) DC	S3 - Undervoltage control supervision(



- 
- AC
- 
- 가 . Protections( ) .
- , .
- .
- 
- 12.10.46 10 - Input line supervision( ), S1 - Phase supervision diode supply( ) Protections( ) .
- 12.10.47 11 - Output phase supervision( ), S1 - Common output phase supervision( ) 가 . Protections( ) .
- 12.10.48 11 - Output phase supervision( ), S2 - Additional closed loop control output phase fault( 가 ) 가 . Protections( ) .
- 12.10.49 11 - Output phase supervision( ), S3 - Additional open loop control output phase fault during start DC brake( 가 ) 가 . Protections( ) .
- 12.10.50 11 - Output phase supervision( ), S4 - Additional closed loop output phase fault during PM StartAngleID run(PM ID 가 ) 가 . Protections( ) .



•

• 가

•

• 가

• FR10-FR11 :

12.10.56 15 - Motor stalled( )

가

Protections( )

•

•

12.10.57 16 - Motor overtemperature( )

가

Protections( )

•

• 가

12.10.58 17 - Motor underload( )

가

Protections( )

•

•

12.10.59 18 - Unbalance( ), S1 - Current unbalance( )

A ( )

12.10.60 18 - Unbalance( ), S2 - DC voltage unbalance(DC )

A ( )

12.10.61 19 - Current overload( )





- 가
- 가

12.10.74 26 - Start-up prevented( ), S2 - RUN request is kept active after  
drive returns to READY state from safe state( 가 가

. Safe Disable( 가)

- 가
- 가

12.10.75 26 - Start-up prevented( ), S30 - RUN request given too quick-  
ly(가 )

가

- 가
- 가

12.10.76 29 - Thermistor fault( ), S1 - Thermistor input activated on  
OPTAF board(OPTAF )

Protections( )

- 
- 
- ( )

12.10.77 29 - Thermistor fault( ), S2 - Special application(  
)

Protections( )

- 
- 
- ( )

12.10.78 30 - Safe disable( 가)

OPTAF  
STO SD1 SD2가 OPTAF

가 Safe Disable( 가)

12.10.79 31 - IGBT temperature (hardware)(IGBT ( ))

IGBT 가

•

•

• ID

12.10.80 32 - Fan cooling( )

'ON' AC

12.10.81 34 - CAN bus communication(CAN )

가

가

가

12.10.82 35 - Application( )

•

•

12.10.83 36 - Control unit( )

•

•

12.10.84 37 - Device changed (same type)( ( )), S1 - Control board( )

가

가

12.10.85 38 - Device added (same type)( 가( )), S1 - Control board( )

가

가

가

가

12.10.86 39 - Device removed( )

가

12.10.87	40 - Device unknown( )	),	S1 - Unknown device( )
	가 ( )	.	
12.10.88	40 - Device unknown( are not identical( : )	),	S2 - StarCoupler: power sub units )
	가 ( )	.	
12.10.89	40 - Device unknown( with the control board( 가 )	),	S3 - StarCoupler is not compatible )
	가 ( )	.	
12.10.90	40 - Device unknown( control board EEPROM( EEPROM )	),	S4 - Wrong PropertiesType in con- )
	가 ( )	.	
12.10.91	40 - Device unknown( board EEPROM size detected( VACON® NXP )	),	S5 - Wrong VACON® NXP control EEPROM )
	가 ( )	.	
12.10.92	40 - Device unknown( software mismatch( (Asic) )	),	S6 - Old power unit (Asic) and new )
	가 ( )	.	
12.10.93	40 - Device unknown( 가 )	),	S7 - Old ASIC detected( ASIC )
	가 ( )	.	
12.10.94	41 - IGBT temperature(IGBT high( IGBT )	),	S1 - Calculated IGBT temperature too
IGBT	가	.	



- 
- 
- ID
  
- 12.10.95 41 - IGBT temperature(IGBT ), S3 - Calculated IGBT temperature too high (long-term protection)( IGBT ( ))
- IGBT 가
  
- 
- 
- ID
  
- 12.10.96 41 - IGBT temperature(IGBT ), S4 - Peak current too high( )
- IGBT 가
  
- 
- 
- ID
  
- 12.10.97 41 - IGBT temperature(IGBT ), S5 - BCU: Filtered current too high for some time(BCU: )
- IGBT 가
  
- 
- 
- ID
  
- 12.10.98 41 - IGBT temperature(IGBT ), S6 - BCU: Current momentarily too high(BCU: )
- IGBT 가
  
- 
- 
- ID
- 
  
- 12.10.99 42 - Brake resistor overtemperature( ), S1 - Internal brake chopper overtemperature( )

•  
 •  
 • 가  
 •  
 12.10.100 42 - Brake resistor overtemperature( ), S2 - Brake re-  
 sistence too high (BCU)(BCU)

•  
 •  
 • 가  
 •  
 12.10.101 42 - Brake resistor overtemperature( ), S3 - Brake re-  
 sistence too low (BCU)(BCU)

•  
 •  
 • 가  
 •  
 12.10.102 42 - Brake resistor overtemperature( ), S4 - Brake re-  
 sistence not detected (BCU)(BCU)

•  
 •  
 • 가  
 •  
 12.10.103 42 - Brake resistor overtemperature( ), S5 - Brake re-  
 sistence leakage (earth fault) (BCU)(BCU)

•  
 •  
 • 가  
 •  
 12.10.104 43 - Encoder fault( ), S1 - Encoder 1 channel A is missing(  
 1 A가 )  
 가

	A가	.		
	.	.	.	.
	.	.	.	.
	- 가	가	.	.
	- 가	/	.	.
12.10.105	43 - Encoder fault(	),	S2 - Encoder 1 channel B is missing(	
1	B가 )			
	가	.		
	B가	.		
	.	.	.	.
	.	.	.	.
	.	.	.	.
	- 가	가	.	.
	- 가	/	.	.
12.10.106	43 - Encoder fault(	),	S3 - Both encoder 1 channels are miss-	
ing(	1 )			
	가	.		
	A B가	.		
	.	.	.	.
	.	.	.	.
	.	.	.	.
	- 가	가	.	.
	- 가	/	.	.
12.10.107	43 - Encoder fault(	),	S4 - Encoder reversed(	가 )
	가	.		
	가	.		
	가	.		
	.	.	.	.
	.	.	.	.
	.	.	.	.
12.10.108	43 - Encoder fault(	),	S5 - Encoder board missing(	
)				
	가	.		
	.	.	.	.
	.	.	.	.
	.	.	.	.

<p>12.10.109 )</p> <p>가</p> <ul style="list-style-type: none"> <li>• OPTBE</li> <li>• OPTBE "Operating mode( )"</li> </ul>	<p>43 - Encoder fault( ),</p>	<p>S6 - Serial communication fault(</p>
<p>12.10.110 B )</p> <p>A B가</p>	<p>43 - Encoder fault( ),</p>	<p>S7 - Ch A / Ch B Mismatch( A /</p>
<p>12.10.111 match( / )</p> <p>/ 가 가 (&gt;1 )가</p> <p>OPTBC "Resolver Poles( )" Gear Ratio( ) 가</p>	<p>43 - Encoder fault( ),</p>	<p>S8 - Resolver/Motor pole pair mis-</p>
<p>12.10.112</p> <p>ID 가</p> <p>ID</p>	<p>43 - Encoder fault( ),</p>	<p>S9 - Missed Start Angle( )</p>
<p>12.10.113 ing( / )</p> <p>가 , "EnDat only(EnDat )" "SSI only(SSI )"( )</p> <ul style="list-style-type: none"> <li>• OPTBE "Operating mode( )" 가 "EnDat+SinCos(EnDat+ )", "SSI+SinCos(SSI+ )"</li> <li>• "SinCos only( )"</li> </ul>	<p>43 - Encoder fault( ),</p>	<p>S10 - Sin/Cos encoder feedback is miss-</p>
<p>12.10.114 )</p> <ul style="list-style-type: none"> <li>• 가</li> <li>• ( , encoder ppr( ppr))</li> </ul>	<p>43 - Encoder fault( ),</p>	<p>S11 - Encoder angle is drifting(</p>

12.10.115 43 - Encoder fault( ), S12 - Dual speed supervision fault( )

가 (0.05 x f<sub>n</sub>) 가 EstimatedShaftFrequency( )

- ShaftFrequency( ) EstimatedShaftFrequency( )
- ShaftFrequency( )가 ,
- EstimatedShaftFrequency( )가 .

12.10.116 43 - Encoder fault( ), S13 - Encoder angle supervision fault( )

( - )가 90° EstimatedAngleError( )

- ID ( )
- 가
- ppr
- 

12.10.117 43 - Encoder fault( ), S14 - Encoder estimated missing pulse fault, switch from the CL ctrl to the OL sensorless ctrl( )

가 가 가

- 
- 
- 
- 

12.10.118 44 - Device changed (different type)( ( )), S1 - Control board( )

- 가
- 
- 
- 가 ,
- 가 ,AC

12.10.119 45 - Device added (different type)( 가( )), S1 - Control board( )

가 가

- 
-

12.10.120 49 - Division by zero in application( 0 )

0 가

- AC 가가

12.10.121 50 - Analogue input lin < 4 mA (sel. signal range 4 to 20 mA)( < 4 mA( 4 ~ 20 mA ))

< 4 mA

- 
- 가
- Protections( )

12.10.122 51 - External fault( )

- 
- 가
- 

12.10.123 52 - Keypad communication fault( )

( VACON® NCDrive)

12.10.124 53 - Fieldbus fault( )

- 
- 가

12.10.125 54 - Slot fault( )

- 
- 

12.10.126 56 - Measured Temperature( )

OPTBH OPTB8

- 가
- 가
- 

12.10.127 57 - Identification(ID)

ID

A ( )

- ID 가
- 가 AC
- 가

12.10.128 58 - Brake( )

가

Protections( )

12.10.129 59 - Follower communication( )

SystemBus CAN

- CAN

12.10.130 60 - Cooling( )

12.10.131 61 - Speed error( )

가

- PMS 가

12.10.132 62 - Run disable(가 가)

가 가 가

가 가

12.10.133 63 - Quick stop( )

A ( )

12.10.134 64 - Input switch open( )

가  
A ( )

12.10.135 65 - Measured Temperature( )

- OPTBH OPTB8
- 가
- 가
- 

12.10.136 70 - Active filter fault( )

( P2.2.7.33 ).  
Protections( )

12.10.137 74 - Follower fault( )

가 , 가



+	System info( )	112
+24 V DC	System( )	100
+24 V		85
<b>A</b>	<b>T</b>	
Active Faults( )	Timeout time( )	110
Application selection( )	Total counters( )	112
Automatic parameter back-up( )		106
<b>C</b>	<b>U</b>	
Cooling( )	UL ,	37
	UL	10
	Up to keypad( )	105
<b>D</b>	<b>가</b>	
Debug menu( )	가	118
Down from keypad( )		106
<b>E</b>		90
EMC		21
EMC		77
EMC		77
EMC		39
Expander board( )		115
Expander boards( )		114
<b>F</b>		122
Fan control( )		111
Fault History( )		99
fault history( )		100
<b>H</b>		149
Hardware settings( )		110
HMI acknowledge timeout(HMI )		111
<b>I</b>		10
ID		119
<b>K</b>		148
Keypad control( )		95
Keypad control( )		95
Keypad reference( )		96
Keypad settings( )		109
<b>M</b>		156
Monitoring( )		91
Multimonitoring items( )		109
<b>P</b>		164
Parameter lock( )		108
Parameter( )		92
Password( )		107
Pre-charge Mode( )		112
<b>S</b>		110
Security( )		107
Sine filter( )		112
Start-up wizard( )		108
	, FR10	50

, FR11 .....	52	
, FR4/FI4 .....	41	
, FR5 .....	42	..... 104
, FR6/FI6 .....	44	
, FR7/FI7 .....	45	
, FR8/FI8 .....	47	..... 83, 89, 114, 115
, FR9 .....	49	
, .....	148	
		..... 15
		..... 18
, .....	147	
		..... 15, 15
.....	86	
		..... 15
.....	25	
		..... 120
.....	91	..... 16
.....	15	
.....	15	
.....	97	..... 148
.....	28	..... 149, 151, 154
		, .....
		..... 150, 153, 155
		..... 38
.....	122	
		..... 117
.....	31	
.....	113	X10-1..... 79
		, OPTA1..... 87
.....	10	..... 40
.....	100	..... 39
.....	15	..... 39
.....	117	..... 161, 161, 163
, .....	116	, OPTA1..... 84
, .....	118	, OPTA2..... 89
		, OPTA3..... 89
		..... 96
		..... 97
.....	12, 13	..... 83
		..... 84
		..... 23, 91
.....	27	..... 28
		..... 29
.....	113	..... 98

.....	124	.....	113
.....	31	.....	105
, FR10–FR11.....	138	, .....	105
, FR7.....	127	, .....	106
, FR8.....	129	, .....	106
, FR9.....	131	, .....	105
, FR4–FR6.....	132	, .....	93, 94
, FR7–FR8.....	134	.....	15
, FR9.....	136	.....	10
, FR4–FR6.....	125	.....	24
, .....	120	, .....	110
.....	140, 142, 144, 145	, .....	110
, .....	141, 143, 145, 146	.....	38, 38, 38
, FR10 .....	68	.....	140, 142, 144, 145
, FR11 .....	72	, .....	141, 143, 145, 146
, FR4–FR6.....	56	.....	114
, FR7/FI7.....	59	.....	31
, FR8/FI8.....	62	.....	97
, FR9.....	65	.....	
.....	56, 59, 62	.....	
.....	37, 38, 38	.....	
.....	146	.....	
, .....	56	.....	
.....	40	.....	
.....	23	.....	

ENGINEERING  
TOMORROW

*Danfoss*

.....  
Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequential changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.  
.....

HSUa >V  
? Vj TVdaXfZVDanfoss Group  
Runsorintie 7  
65380 Vaasa  
Finland  
drives.danfoss.com

