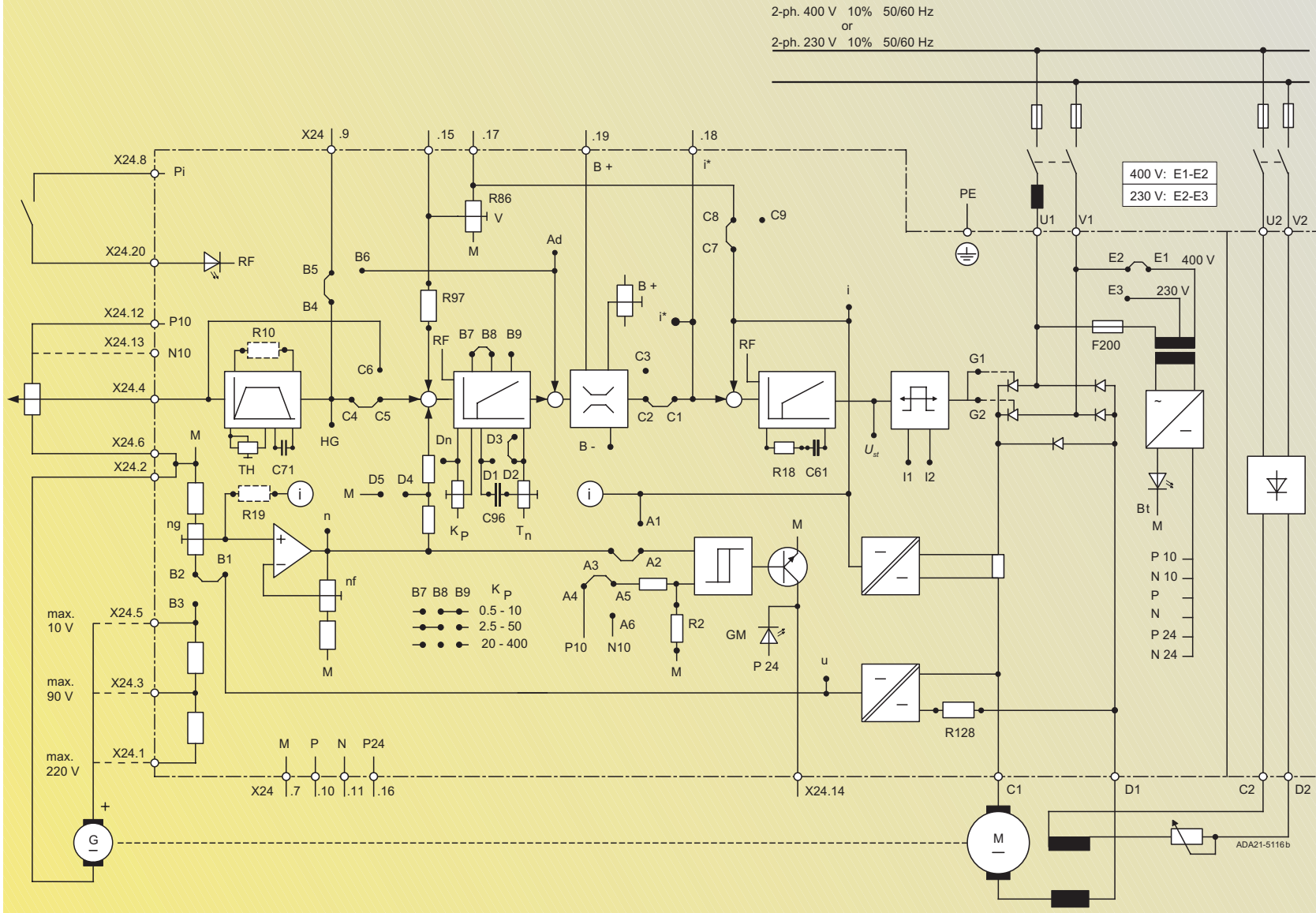


Fig. 1/10
6RA22 SIMOREG K converter in half-controlled, single-bridge connection B2HK for single-quadrant drives



Connections of 6RA22 SIMOREG K converters in B2HK connection for single-quadrant drives					
Power section	L1	U1	Input	2-ph. 400 V or	See technical data
	L2	V1	Input	2-ph. 230 V	
	+ -	C1 D1	Output Output	max. 315 V or 180 V max. 315 V or 180 V	
Field rectifier	L1	U2	Input	2-ph. 400 V	See technical data
	L2	V2	Input	2-ph. 400 V	
	+ -	C2 D2	Output Output	340 V 340 V	
Power supply	L1	–	–	2-ph. 400 V or	Connected internally to terminals U1/V1 of the power section. For 400 V solder jumper E2-E1 closed, for 230 V solder jumper E2-E3 closed. Total loading for each polarity: 50 mA Connection for speed setpoint potentiometer M/P10: with ramp-function generator, jumper C5-C4 closed; M/N10: without ramp-function generator, jumper C5-C6 closed.
	L2	–	–	2-ph. 230 V	
	M	7	Output	0 V (M potential)	
	P	10	Output	+15 V/50 mA	
	N	11	Output	- 15 V/50 mA	
	P24	16	Output	+24 V/50 mA	
Speed controller	Setpoint	4	Input	0 to +10 V/200 k Ω	Jumper C5-C4 closed: ramp-function generator setpoint input
		4	Input	0 to -10 V/20 k Ω	Jumper C5-C6 closed: speed controller setpoint input
		9	Output	0 to -10 V	Jumper B5-B4 closed: ramp-function generator output (e.g. for 2nd unit)
		9	Input	0 to +10 V	Jumper B5-B6 closed: summing amplifier setpoint input (supplementary current setpoint)
	Actual value	2	Input	0 V (ref. potential)	Jumper B2-B3 closed: speed controller actual value input
		1	Input	80 to 220 V/78 k Ω	speed controller actual value input
		3	Input	30 to 90 V/31 k Ω	(connection only for speed actual value sensing by tacho-generator)
	Ext. current limiting	5	Input	10 to 40 V/13 k Ω	
		19	Input	0 to +10 V	Current setpoint + supplementary current setpoint limiting
Current controller	Setpoint	18	Output	0 to +10 V	Jumper C2-C1 closed: current setpoint from speed controller
		18	Input	0 to +10 V	Jumper C2-C3 closed: external current setpoint
Other functions	Controller enable (Pi) (Rf)	8	Output	+24 V/100 Ω	Power supply for ext. controller enable
	Limit monitor	20	Input	+20 to +30 V/4 mA	Connect to terminal 8 for controller enable
		14	Output	Open collector	Jumpers A2-A3 and A5-A4 closed: speed actual value interrogation (<i>n</i> > comparison voltage results in P24 over 2.7 k Ω ; jumpers A2-A1 and A5-A6 closed: current actual value interrogation (<i>i</i> > comparison voltage results in M)
	Potentiometer R86	17	Input	0 to -10 V/10 k Ω	Jumper C8-C9 closed: speed controller setpoint input (supplementary speed setpoint)
		17	Input	0 to -10V	Jumper C8-C7 closed: speed controller setpoint input (<i>I</i> x <i>R</i>) compensation for EMF control without tacho-generator.
	Potentiometer R86 tap	15	Output	0 to -10 V	Jumper C8-C7 closed, resistor R97 removed: current actual value tap
		15	Output	0 to $\pm$ 10 V/10 k Ω	Jumper C8-C9 closed, resistor R97 removed: potentiometer R86 can be used as required.

Function	Matrix board	Function	Matrix board
Matrix board assignment for 6RA22 SIMOREG K converters in connection (B2)A(B2)C for four-quadrant drives			
Supplementary setpoint input, speed controller	RA1	Output, free CMOS inverter	RB6
Setpoint filtering, speed controller	RA2	Input, free CMOS inverter	RB7
Input positive current limit	RA3	Input, current setpoint to current control loop	RB8
Input negative current limit	RA4	Input, supplementary current setpoint before current limiting	RB9
Input EMF actual values for EMF precontrol	RA5	Output n (± 10 V)	RB11
Free output via terminal X23.18 (filtered)	RA6	Output + i (± 10 V)	RB13
Free output via terminal X23.17 (filtered)	RA7	Separate inhibit for ramp-function generator (+15 to +24 V inhibits)	RB15
Free input via 2 x 10 k Ω /10 nF at terminal X23.26	RA8	Input, speed setpoint at speed controller	RC1
Free input via 2 x 10 k Ω /10 nF at terminal X23.25	RA9	Speed controller output after current limiting	RC3
Free input via 2 x 10 k Ω /10 nF at terminal X23.24	RA10	Technology connector X1.7	RC4
Free input via 2 x 100 k Ω /10 nF at terminal X23.23	RA11	Current actual value	RC5
Free FET switch (1) driven via terminal X23.22	RA12/RA13	Positive reference voltage +10 V	RD1
Free FET switch (2) driven via terminal X23.21	RA14/RA15	Negative reference voltage -10 V	RE1
Free output via 2 x 56 Ω /47 nF at terminal X23.16	RA16	M reference potential 0 V	RF1
Free output via 2 x 56 Ω /47 nF at terminal X23.15	RA17	P15 regulated +15 V	RG1
Direct connection to terminal X23.18	RA18	N15 regulated -15 V	RH1
Ramp-function generator output	RB1	Output, fault signal	RM4
Extension input for ramp-function generator	RB3	Ack. button connection to reset fault signal	RM5/RM6
Technology connector X1.1	RB4	Connection to X35.32	RM8
Matrix board assignment for SIMOREG K converters in circuit B6C for single-quadrant drives			
Power supply		+10 V (P10)	RA4 ^{*)}
		- 10 V (N10)	RA5 ^{*)}
		0 V (M)	RA3 ^{*)}
		+15 V (P)	RA1 ^{*)}
		- 15 V (N)	RA2 ^{*)}
Speed controller		Speed setpoint	RA9
		Speed controller setpoint smoothing	RA13
		Speed actual value	RA12
		Ramp-function generator output overdrive amplifier	RA11
		Controller enable	RA6
		Current limiting B+	RA7
		Current actual value	RA8
		Extension input, ramp-function generator	RB9
Other functions		Current actual value V_{actual}	RA10
		Speed actual value decoupled	RH1
		Supplementary current setpoint	RB11
		Current actual value decoupled	RR7
		Input, reset ramp-function generator	RR3
Matrix board assignment for SIMOREG K converters in circuit (B6)A(B6)C for four-quadrant drives			
Selector output terminal X1.18 without smoothing	RA4	+10 V (P10)	RD1
Selector output terminal X1.18 with smoothing 2 x 50 Ω /47 nF	RA5	- 10 V (N10)	RE1
Selector output terminal X1.17 with smoothing 2 x 50 Ω /47 nF	RA6	0 V (M)	RA1
Selector output terminal X1.16 with smoothing 2 x 50 Ω /47 nF	RA9	+15 V (P)	RB1
Selector output terminal X1.15 with smoothing 2 x 50 Ω /47 nF	RA10	- 15 V (N)	RC1
Selector input terminal X1.26 (2 x 10 k Ω /10 nF)	RA7	Speed setpoints smoothing	RF2
Selector input terminal X1.25 (2 x 10 k Ω /10 nF)	RA8	Speed actual value	RG2
Selector input terminal X1.24 (2 x 50 k Ω /10 nF)	RA11	Connection to technology connector (X4.1)	RD2
Selector input terminal X1.23 (2 x 100 k Ω /10 nF)	RA12	Connection to technology connector (X4.7)	RC2
Free inverter (input)	RB6	Ramp-function generator supplementary setpoint	RB9
Free inverter (output)	RB7	Output, speed controller	RB2
Free FET switch (via optocoupler input terminal 21)	RA15, RA16	Speed supplementary setpoint	RB5
Free FET switch (via optocoupler input terminal 22)	RA13, RA14	Positive current limiting	RE2
Current setpoint	RB4	Negative current limiting	RB10
Speed setpoint	RB3	EMF precontrol external	RA3
Current actual value	RB8	Free terminal 27	RI16
Speed actual value	RH1	Free terminal 28	RK16
Ramp-function generator output	RA2	$\pm$ current actual value	RO7
Current supplementary setpoint input	RB11	Ramp-function generator	RO3
		Fault	RO4
		Fault acknowledge	RO6
		Contact for fault acknowledge button	RO5/RO6

*) Total loading per polarity: 50 mA

Fig. 1/12
6RA22 SIMOREG K converter in fully-controlled, three-phase bridge connection B6C for single-quadrant drives

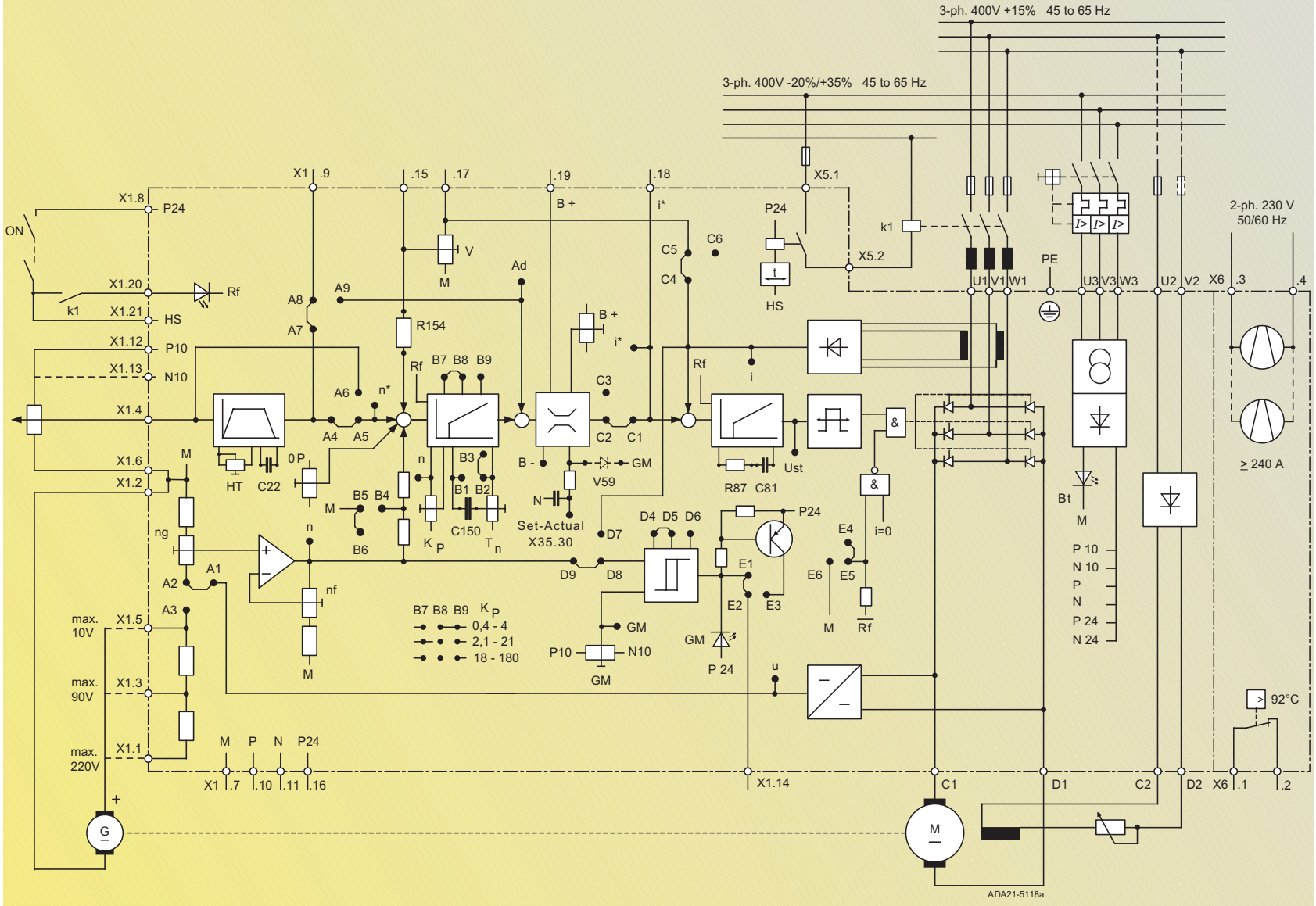
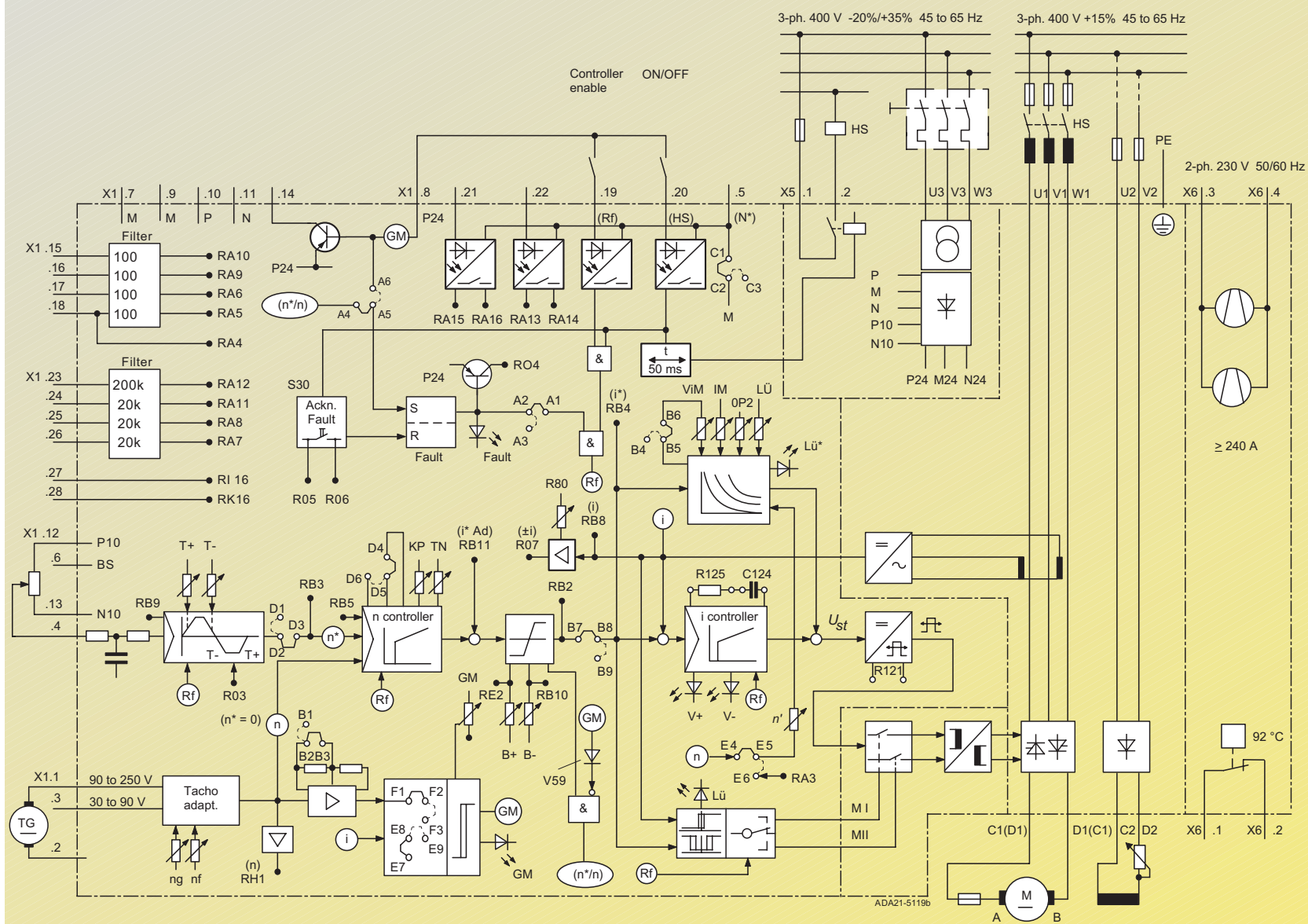


Fig. 1/13
6RA22 SIMOREG K converter in circulating-current-free inverse-parallel connection using two fully-controlled three-bridge circuits (B6)A(B6)C for four-quadrant drives



Function		Terminal	Type	Connection values	Comments
Connections of 6RA22 SIMOREG K converters in (B2)/A(B2)/C connection for four-quadrant drives					
Power section	L1	U1	Input	2-ph. 400 V or	See technical data
	L2	V1	Input	2-ph. 230 V	
	+ (-) - (+)	C (D) D (C)	Output Output	Max. 260 V or 150 V	
	Relay contact	X95. 1/2	Output	250 V/5 A AC Max. switching capacity 1100 VA	For switching-in the main contactor
Power supply	L1	U2	Input	2-ph. 400 V or	For 400 V solder jumper A2/A1 closed, for 230 V solder jumper A2-A3 closed See technical data
	L2	V2	Input	2-ph. 230 V	
	M	X23.7	Output	0 V (M potential)	Total loading per polarity: 50 mA
	M	X23.9	Output	0 V (M potential)	
	P	X23.10	Output	+15 V	
	N	X23.11	Output	- 15 V	
	P24	X23.8	Output	+24 V	Connection for speed setpoint potentiometer M/P10 (with ramp-function generator): direction I; M/N10 (with ramp-function generator): direction II.
	M	X23.6	Output	0 V (ref. potential)	
	P10	X23.12	Output	+10 V/10 mA	
	N10	X23.13	Output	- 10 V/10 mA	
Speed controller	Setpoint	X23.4	Input	+10 to -10 V/20 k Ω	Jumper C2-C3 closed: ramp-function generator setpoint input
	Actual value	X23.2	Input	0 V (ref. potential)	
		X23.1	Input	80 to 220 V/78 k Ω	
		X23.3	Input	30 to 90 V/31 k Ω	
Other functions	ON command (power contactor ON)	X23.20	Input	+20 to +30 V	Reference potential M: jumpers B2-B3 and A8-A7 closed, terminal 5 open Reference potential N24: jumpers B2-B3 and A8-A9 closed, terminal 5 open Reference potential provided externally via terminal 5: jumper B2-B1 closed (floating control signal)
		X23.20	Input	0 to +24 V	
		X23.20	Input	+20 to +30 V	
	Controller enable (checkback for power contactor ON)	X23.19	Input	See terminal X23.20	See terminal X23.20
	Free optocoupler	X23.21	Input	See terminal X23.20	See terminal X23.20
	Free optocoupler	X23.22	Input	See terminal X23.20	See terminal X23.20
	Floating control signal	X23.5	Input	0 to -30 V	Externally provided reference potential for floating control signal at terminals X23.19, X23.20, X23.21 and X23.22: jumper B2-B1 closed
	Limit monitor	X23.14	Output	+24 V/50 mA	Jumpers A2-A1 and A5-A4 closed: speed actual value interrogation Jumpers A2-A3 and A5-A6 closed: current actual value interrogation
	Free input terminals	X23.23	Input	2 x 100 k Ω /10 nF	Matrix board RA11 Matrix board RA10 Matrix board RA9 Matrix board RA8
		X23.24	Input	2 x 10 k Ω /10 nF	
		X23.25	Input	2 x 10 k Ω /10 nF	
		X23.26	Input	2 x 10 k Ω /10 nF	
	Free output terminals	X23.15	Output	2 x 50 Ω /47 nF	Matrix board RA17 Matrix board RA16 Matrix board RA7 Matrix board RA6
		X23.16	Output	2 x 50 Ω /47 nF	
		X23.17	Output	2 x 50 Ω /47 nF	
		X23.18	Output	2 x 50 Ω /47 nF	

Function		Terminal	Type	Connection values	Comments
Connections of 6RA22 SIMOREG K converters in B6C connection for single-quadrant drives					
Power section	L1	U1	Input	3-ph. 400 V	See technical data
	L2	V1	Input	3-ph. 400 V	
	L3	W1	Input	3-ph. 400 V	
	+	C1	Output	DC 485 V	
	-	D1	Output	DC 485 V	
	Relay contact	X5.1/2	Output	AC 250 V/5 A	For switching the main contactor
Field rectifier	L1	U2	Input	2-ph. 400 V	See technical data
	L2	V2	Input	2-ph. 400 V	
	+	C2	Output	DC 340 V	See technical data
	-	D2	Output	DC 340 V	
Power supply	L1	U3	Input	3-ph. 400 V	See technical data
	L2	V3	Input	3-ph. 400 V	
	L3	W3	Input	3-ph. 400 V	
	M	X1.7	Output	0 V (M potential)	Total loading per polarity: 50 mA
	P	X1.10	Output	+15 V/50 mA	
	N	X1.11	Output	- 15 V/50 mA	
	P24	X1.8/16	Output	+24 V/50 mA	
	M	X1.6	Output	0 V (ref. potential)	Connection for speed setpoint potentiometer
	P10	X1.12	Output	+ 10 V/10 mA	
	N10	X1.13	Output	- 10 V/10 mA	
Speed controller	Setpoint	X1.4	Input	0 to +10 V/200 k Ω	Jumper A5-A4 closed: ramp-function generator setpoint input Jumper A5-A6 closed: speed controller setpoint input
		X1.4	Input	0 to -10 V/ 20 k Ω	
		X1.9	Input	0 to -10 V/100 k Ω	
	Actual value	X1.9	Output	0 to -10 V	Jumper A8-A9 closed: summing amplifier input (supplementary current setpoint)
		X1.2	Input	0 V (ref. potential)	Jumper A7-A8 closed: ramp-function generator output Jumper A2-A3 closed: speed controller actual value input (connection only for speed actual value sensing by means of tachogenerator)
		X1.1	Input	80 to 220 V/78 k Ω	
		X1.3	Input	30 to 90 V/31 k Ω	
		X1.5	Input	0 to +10 V	
	External current limiting	X1.19	Input	0 to +10 V/33 k Ω	Limiting the sum of current setpoint + supplementary current setpoint
Current controller	Setpoint	X1.18	Input	0 to +10 V/100 nF, 56 Ω	Jumper C1-C2 closed: current setpoint from speed controller C2-C3 closed: external current setpoint
Other functions	On/Off command	X1.21	Input	+20 to +30 V	Switching command, main contactor On
	Controller enable	X1.20	Input	+20 to +30 V	Prerequisite, terminal X1.21 = H signal
	Power supply	X1.8	Output	+24 V across 100 Ω	Exclusively for supply to terminals X1.20 and X1.21
	Limit monitor	X1.14	Output	+24 V/50 mA	Switch loads with respect to P24, because terminal X1.14 switches to M
	Wiper of potentiometer R157	X1.15	Input		Supplementary input for speed controller or ($I \times R$) compensation
	Free connection of potentiometer R157	X1.17	Input	± 10 V	
	Selector input	X1.22	Input	± 10 V	On matrix board A14 for free use
Fan	Supply	X6.3 X6.4	Input Input	2-ph. 230 V 2-ph. 230 V	Fan connection for units ≥ 240 A
	Temperature switch	X6.1 X6.2	Output Output	Floating relay contact	Opens at overtemperature

Function		Terminal	Type	Connection values	Comments
Connections of 6RA22 SIMOREG K converters in (B6)A(B6)C connection for four-quadrant drives					
Power section	L1	U1	Input	3-ph. 400 V	See technical data
	L2	V1	Input	3-ph. 400 V	
	L3	W1	Input	3-ph. 400 V	
	+ (-)	C (D)	Output	DC 420 V	For switching the main contactor
	- (+)	D(C)	Output	DC 420 V	
	Relay contact	X5.1/2	Output	AC 250 V/5 A	
Power supply	L1	U3	Input	3-ph. 400 V	See technical data
	L2	V3	Input	3-ph. 400 V	
	L3	W3	Input	3-ph. 400 V	
	M	X1.7	Output	0 V (M potential)	See technical data
	M	X1.9	Output	0 V (M potential)	
	P	X1.10	Output	+15 V/50 mA	
	N	X1.11	Output	- 15 V/50 mA	Connection for speed setpoint potentiometer
	M	X1.6	Output	0 V (ref. potential)	
	P10	X1.12	Output	+10 V/10 mA	
	N10	X1.13	Output	- 10 V/10 mA	
Field rectifier	L1	U2	Input	2-ph. 400 V	See technical data
	L2	V2	Input	2-ph. 400 V	See technical data
	+	C2	Output	DC 340 V	
	-	D2	Output	DC 340 V	
Speed controller	Setpoint	X1.4	Input	±10 V/20 k Ω	Setpoint for ramp-function generator (2 to 30 s)
	Actual value	X1.2	Input	0 V (ref. potential)	
		X1.1	Input	80 to 220 V/78 k Ω	
		X1.3	Input	30 to 90 V/31 k Ω	Bridge R32
		X1.3	Input	10 to 30 V	
Other functions	On command (switches main contactor On)	X1.20	Input	+20 to +30 V	Reference potential M: jumpers C1-C2 and C4-C5 closed Reference potential N24: jumpers C1-C2 and C5-C6 closed External reference potential via terminal 5: jumpers C2-C3 and C4-C5 closed
		X1.20	Input	0 to +24 V	
		X1.20	Input	+20 to +30 V	
	Controller enable	X1.19	Input	As for terminal 20	As for terminal X1.20
	Free optocoupler	X1.21	Input	As for terminal 20	As for terminal X1.20
	Free optocoupler	X1.22	Input	As for terminal 20	As for terminal X1.20
	P24	X1.8	Output	+24 V (across 100 Ω)	Only for supplying terminals X1.19 to X1.22
	Floating control signal (N*)	X1.5	Input	0 to -30 V (ext.)	External reference potential at terminal X1.5
	Limit monitor	X1.14	Output	+24 V/50 mA	Matrix board RA12 Matrix board RA11 Matrix board RA8 Matrix board RA7 Matrix board RI16 Matrix board RK16
	Free input terminals	X1.23	Input	±10 V/2 x 100 k Ω /10 nF	
		X1.24	Input	±10 V/2 x 10 k Ω /10 nF	
		X1.25	Input	±10 V/2 x 10 k Ω /10 nF	
		X1.26	Input	±10 V/2 x 10 k Ω /10 nF	
	Free input/output terminals	X1.27	Input/Output	±10 V/2 x 10 k Ω /10 nF	Matrix board RI16 Matrix board RK16
		X1.28	Input/Output		
	Free output terminals	X1.15	Output	2 x 50 Ω /47 nF	Matrix board RA10
		X1.16	Output	2 x 50 Ω /47 nF	Matrix board RA9
		X1.17	Output	2 x 50 Ω /47 nF	Matrix board RA6
		X1.18	Output	2 x 50 Ω /47 nF	Matrix board RA5
Fan	Supply	X6.3	Input	2-ph. 230 V	Fan connection for units ≥ 240 A
		X6.4	Input	2-ph. 230 V	
	Temperature switch	X6.1	Output	Floating relay contact	Opens at overtemperature
		X6.2	Output		