In-/output signals

The converter can be connected in 4 different ways to a control unit via analogue/digital links. Only one of the four choices can be used at the same time. In addition to this an extension of I/O´s by SDCS-IOE 1 is possible.

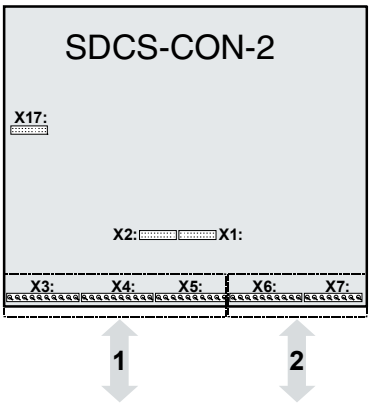


Fig. 2.5/1: I/O´s via SDCS-CON-2
Analogue I/O´s: standard
Digital I/O´s: not isolated
Encoder input: not isolated

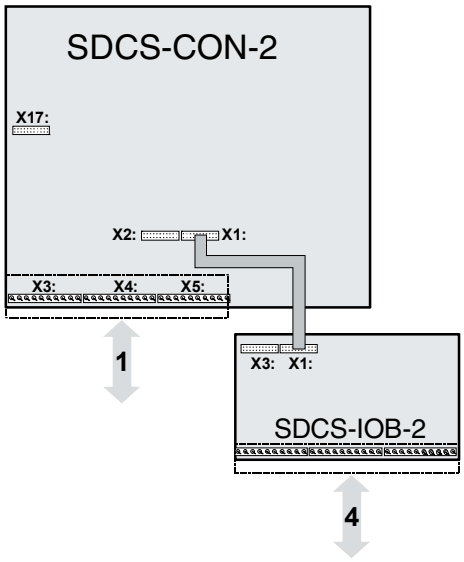


Fig. 2.5/2: I/O´s via SDCS-CON-2 and SDCS-IOB-2
Analogue I/O´s: standard
digital I/O´s: all isolated by means of optocoupler/relay; the signal status is indicated by LED

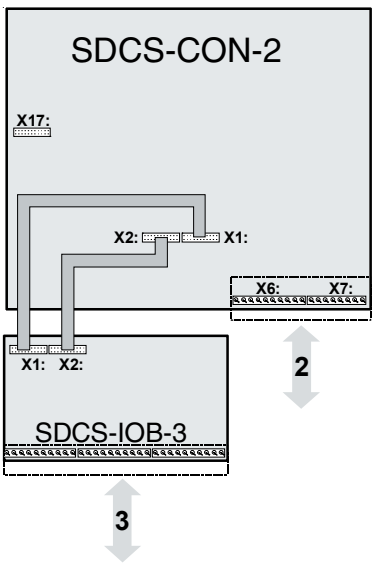


Fig. 2.5/3: I/O´s via SDCS-CON-2 and SDCS-IOB-3
Analogue I/O´s: more input capacity
digital I/O´s: not isolated
encoder input: isolated
current source for: PT100/PTC element

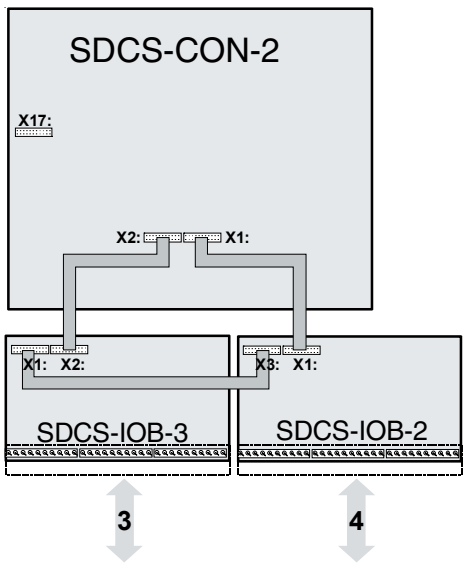


Fig. 2.5/4: I/O´s via SDCS-IOB-2 and SDCS-IOB-3
Analogue I/O´s: more input capacity
digital I/O´s: all isolated by means of optocoupler/relay; the signal status is indicated by LED
current source for: PT100/PTC element

Description of I/O signals SDCS-CON-2

Mechanical system integrated in control board

Terminals
Screw type terminals for finely stranded wires up to 2.5 mm²

Functionality

⇨ **1 tacho input**
Resolution: 12 bit + sign; differential input; common mode range ±20 V
3 ranges from 8...30...90...270 VDC with n_{max}

⇨ **4 analogue inputs**
Range -10...0...+10 V, 4...20 mA, 0...20 mA
All as differential inputs; R_E = 200 kΩ; time constant of smoothing capacitor ≤2 ms
Input 1: Resolution: 12 bit + sign; common mode range ±20 V
Inputs 2, 3, 4: Resolution: 11 bit + sign; common mode range ±40 V
Current source for PTC element evaluation via jumper and input 2

⇦ **2 outputs**
+10 V, -10 V, I_A ≤ 5 mA; sustained short-circuit-proof
voltage supply for reference potentiometer

⇦ **1 analogue output**
bipolar current actual - from power section; decoupled
IdN = ±3 V; I_A≤ 5 mA, short-circuit-proof

⇦ **2 analogue outputs**
Range -10...0...+10 V; I_A ≤ 5 mA
Output signal and scaling can be selected by means of software
Resolution: 11 bit + sign

⇨ **1 pulse generator input**
Voltage supply for 5 V/12 V/24 V pulse generators (sustained short-circuit-proof)
Output current with 5 V: I_A ≤ 0.25 A
12 V: I_A ≤ 0.2 A
24 V: I_A ≤ 0.2 A
Input range: 12 V/24 V: asymmetrical and differential
5 V: differential
Pulse generator as 13 mA current source: differential
Line termination (impedance 120Ω), if selected
max. input frequency ≤300 kHz

⇨ **8 digital inputs**
The functions can be selected by means of software.
Input voltage: 0...8 V ⇒ "0 signal", 16...60 V ⇒ "1 signal"
Time constant of smoothing capacitor: 10 ms
R_E = 15 kΩ
The signal refers to the unit housing potential.
Auxiliary voltage for digital inputs: +48 V DC, ≤ 50 mA, sustained short-circuit-proof

⇦ **7+1 digital outputs**
The function can be selected by means of software.
7 outputs: relay driver with free-wheeling diode, total current limitation ≤ 160 mA; short-circuit-proof.
1 relay output - on power board SDCS-POW-1 (N.O. contact: **AC**: ≤250 V/ ≤3 A / **DC**: ≤24 V/ ≤3 A or ≤115/230 V/ ≤0.3 A) protected by VDR component.

Description of I/O signals SDCS-IOB-2x & SDCS-IOB-3

Mechanical system always external, outside the module

Terminals
Screw type terminals for finely stranded wires up to 2.5 mm²

Functionality of SDCS-IOB-3

⇨ **1 tacho input**
Resolution: 12 bit + sign; differential input; common mode range ±20 V
Range 8 V- with n_{max}; if higher tacho voltages are in use tacho adaptation board PS 5311 is needed.

⇨ **4 analogue inputs**
All as differential inputs; time constant of smoothing capacitor ≤2 ms
Input 1: Range -10 V...0...+10 V; -20 mA...0...+20 mA; 4... 20 mA unipolar; R_E = 200 kΩ/ 500Ω/ 500Ω; Resolution: 12 bit + sign; common mode range ±20 V
Inputs 2+3: Range see input 1, in addition -1 V...0...+1 V
R_E = 200 kΩ/ 500Ω/ 500Ω/ 20kΩ; Resolution: 11 bit + sign; common mode range with -1 V...0...+1 V range ±10 V, otherwise ±40 V
Input 4: Range see input 1
R_E = 200 kΩ/ 500Ω/ 500Ω; Resolution: 11 bit + sign; common mode range ±40 V

⇨ **Residual current detection** in combination with analogue input 4 (sum of phase currents ≠ 0)

⇦ **2 outputs**
+10 V, -10 V; I_A ≤ 5 mA; sustained short-circuit-proof
voltage supply for reference potentiometer

⇦ **1 analogue output**
Bipolar current actual - from power section; decoupled
IdN = ±3 V (at gain = 1); I_A≤ 5 mA; U_{Amax} = 10 V; gain can be adjusted by means of a potentiometer between 0.5 and 5; short-circuit-proof

⇦ **2 analogue outputs**
Range -10...0...+10 V; I_A ≤ 5 mA; short-circuit-proof
Output signal and scaling can be selected by means of software
Resolution: 11 bit + sign

⇦ **Current source** for PT 100 or PTC element
I_A = 5 mA / 1.5 mA

⇨ **1 pulse generator input**
Voltage supply, output current, input range: **see SDCS-CON-2**
Inputs electrically isolated from 0 V (housing) by means of optocoupler and voltage source.

Functionality of SDCS-IOB-2x
3 different designs available:
- **SDCS-IOB-21** inputs for 24...48 V DC; R_E = 4.7 kΩ
- **SDCS-IOB-22** inputs for 115 V AC; R_E = 22 kΩ
- **SDCS-IOB-23** inputs for 230 V AC; R_E = 47 kΩ

Terminals
Screw type terminals up to 4 mm²

⇨ **8 digital inputs**
The functions can be selected by means of software.
The signal status is indicated by LED.
All isolated by means of optocouplers.
Input voltage: IOB-21:0...8 V ⇒"0 signal", 18...60 V ⇒"1 sig."
IOB-22:0...20 V ⇒"0 signal", 60...130 V ⇒"1 sig."
IOB-23:0...40 V ⇒"0 signal", 90...250 V ⇒"1 sig."
Filter time constant: 10 ms (channels 1...6); 2 ms (channels 7+8)
Auxiliary voltage for digital inputs: +48 V DC; ≤ 50 mA; sustained short-circuit-proof; referenced to the unit housing potential.

⇦ **8 digital outputs**
The functions can be selected by means of software.
The signal status is indicated by LED.
6 of them potential isolated by relay (N.O. contact: **AC**: ≤250 V/ ≤3 A / **DC**: ≤24 V/ ≤3 A or ≤115/230 V/ ≤0.3 A), protected by VDR component.
2 of them potential isolated by optocoupler, protected by zener diode (open collector) 24 V DC external, I_A ≤ 50 mA.

2.30	COMMON PARTS FOR CONV. DCS500/DCS600 and DCF500/600				
DESCRIPTION	QTY		CODE	TYPE/DATA	NOTES
*)DI/DO connection board	1*		3BSE005176R1	SDCS-IOB-21	24V DC-48V DC; digital (A9)
*)DI/DO connection board	1*		3BSE005177R1	SDCS-IOB-22	115V AC ; digital (A9)
*)DI/DO connection board	1*		3BSE005178R1	SDCS-IOB-23	230V AC ; digital (A9)
AI/AO connection board	1		3BSE004086R1	SDCS-IOB-3	analog (A 10)
Communication Board	1		3ADT220059R1	SCDS-COM-5	separate
AMC-Communic. Board DCS600	1		3ADT312700R1	AMC-DC-2 Board	without Software f. DCS600
AMC-Communic. Board DCS600	1		3ADT312700R2	AMC-DC-Clas-2 B.	without Software f. DCS600
Control Panel CDP312	1		3ADT220071R5	CDP312 Rev.F	For DCS500B & DCS600
I/O Extension Board	1		3BSE005851R1	SDCS-IOE-1	
Adapt. Board /Analog Tacho	1		3ADT300600R1	PS 5311- SET	

*) Select only one Board

DCR-Kit contains:	2Q	4Q

2.40	PARTS FOR DCR REBUILD KITS, (12 Pulse etc. see item 2.41)				
DESCRIPTION	2Q	4Q	CODE	TYPE/DATA	NOTES
Cooling fan	1	1	DCA0017670P1	CN52B2	for DCR500B/600 Type
Pulse Interface Board	1	1	DCF1154914R1	SDCS-REB-1	DCR >= 1 Stage
Pulse Amplifier Board	1	1	DCF1192115R1	SDCS-REB-2	DCR >= 2 Stages
Pulse Distribution Board	1	1	3ADT309300R1	SDCS-REB-3	DCR >= 3 Stages
Power Supply for REB-2	2	2	DCE8920037P1	NPSM-01	230V/24V DC/ 2A >= 2 Stages
below listed SDCS- PIN-48 and PIN-51 are identical with A5/A7 and C4 Modules; A6 modules use SDCS-PIN-48 or SDCD-PIN-46-coat					
Pulstransformer Board	1	2	3BSE004939R2	SDCS-PIN-48	
Power interface board	1	1	3BSE004940R1	SDCS-PIN-51	for 400V up to 1000V AC
Current Transformer 2500/1A	2	2	3ADT751010P1	LT2032 2500/1A	T51/T52 for A5 and A6 Range
Current Transformer 4000/1A	2	2	3ADT751007P1	4000/1A	T51/T52 for A7/C4 Range

2.41	PARTS FOR 12 PULSE SYST.; SUPPLY > 800V-AC & HARD PAR. CONV. A7P				
DESCRIPTION	2Q	4Q	CODE	TYPE/DATA	NOTES
Current Measurement Aid	1	1	3ADT220090R22	SDCS-CMA-2	12 Pulse and Paralleling Converter
Insulation Monitor (10V)	1	1	DCA0019192P1	IRDH 265-4	mounted inside Cab.10-990kOhm
Insulation Monitor (10V)	1	1	3ADV050058P5	IRDH 365-4	Door mounted Vers.10- -990kOhm
Insulation Monitor (10V)	1	1	3ADV050058P1	IRDH 265-3	inside Cab.-EMBR; 2 - 200kOhm
Volt. Adapt. Board f. IRDH 6P.	1	1	DCA0019711P1	AGH 204 S	For IRDH >= 690V-AC 6Pulse
Volt. Adapt. Board f. IRDH 12P.	1	1	3ADV050058P2	AGH 150 W-4	For IRDH >= 690V-AC 12Pulse
DC-DC Transducer (Knick) A92	1	1	3ADN260004P1	8680 A1/A92	For U-AC > 800V & 12 Pulse ser.
High Volt. Transformer T 90	1	1	3ADT745047P1	T 90; 500-1200V-AC	For U-AC > 800V & 12 Pulse ser.
High Volt. Fuses for U >800V-AC	5	5	DCE8063614P1	CC 1500CP GRD 20	2 pcs. for A92; 3 pcs. for T90 ;
Paralleling Interface Board 1	1	1	3ADT220090R31	SDCS-PAR-1-coat	Paralleling Master Conv.
Paralleling Interface Board 2	1	1	3ADT220090R32	SDCS-PAR-2-coat	Paralleling Slave Conv.

2.50	2-PHASE FIELD EXCITERS				
DESCRIPTION	QTY		CODE	TYPE/DATA	NOTES
Integrated uncontr. 6 A;FEX-1	1		DCA0012317R1	SDCS-FEX-1	Sep. compl. Unit; incl. Diode M.
Integrated single 16 A;FEX-2A	1		DCA0012325R1	SDCS-FEX-2 A	Sep. compl. Unit; incl. Thyristor M.
Control Board DCF503A0050	1		3ADT312400R2	SDCS-FEX-32A	Control Board f. DCF503A0050
Thyristor/Diode Module 1Q 50A	2		DCA0003270P1	SKKH 57	for DCF503A0050
Control Board DCF504A0050	1		3ADT312400R1	SDCS-FEX-31A	Control Board f.DCF504A0050
Thyristor modules 4Q 50A	2		DCA0011132P1	SKKT 42	for DCF504A0050
Ext. DCF503A0050; 1Q 50 A	1		3ADT209019R1	DCF503A0050	Complete unit DCF503A0050
Ext. DCF504A0050; 4Q 50 A	1		3ADT209019R2	DCF504A0050	Complete unit DCF504A0050
Ext. DCF503A0060; 1Q 60 A	1		3ADT209019R11	DCF503A00**60**	Complete unit DCF503A0060
Ext. DCF504A0060; 4Q 60 A	1		3ADT209019R12	DCF504A00**60**	Complete unit DCF504A0060
Addit. Fan for DCFxxxA0060	2		GHSN700002P1	AC220V 8556V	Fan M55/M56 f. DCFxxxA0060

2.60	Parts for Three-Phase Fieldexc.; 25A ---520A; Overvolt.Protect. DCF506-..				
DESCRIPTION		4 Q	CODE	TYPE/DATA	NOTES
Control Board for DCF505/506 Units		1	3BSE006309R1	SDCS-FEP-1	(1400V) for DCF505/506
Overvolt. Protect. for Motorfieldexc.		1	DCF1127101R1	DCF506-0140-51	3-Phase Fieldexc. 25A - 100A
Overvolt. Protect. for Motorfieldexc.		1	DCF1127119R1	DCF506-0520-51	3-Phase Fieldexc. 200A - 520A
Overvolt. Protect. for inductive Load		1	DCF1216235R1	DCF506-1200-51	3-Phase EMBR's 820-1200A