

Appendix A- Spare Parts List

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- 41A and PIN-51 are identical with A5/A6/A7 and C4 Modules							
Pulstransformer Board			1	2	3BSE004939R1	SDCS-PIN-41 A	
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	DCF503A0060	Complete unit DCF503A0060	
Ext. DCF504A0060; 4Q 60 A	1	3ADT209019R12	DCF504A0060	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

6.2 Analogue I/O board SDCS-IOB-3

As described at the beginning of the chapter, there are various options for configuring the inputs/outputs.

The board SDCS-IOB-3 consists of the 5 analogue inputs, 3 analogue outputs, the galvanical isolated pulse encoder interface and a current source for temperature measuring devices.

If these boards are in use, they have to be mounted outside the DCS module. They must be mounted in a way, that the conductive supports have a good connection to ground of the installation.

The cable length between X1/X1: and X2/X2: is max. 1.7 m and between X1/X3: is max. 0.5 m because of EMC reasons.

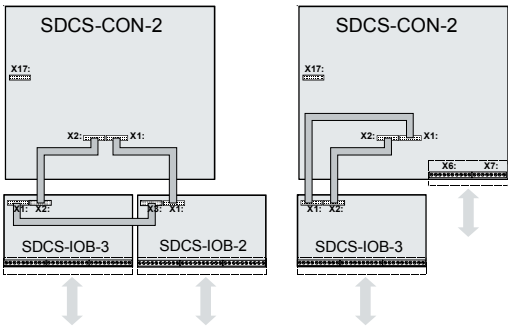


Fig. 6.2/1 I/O via SDCS-IOB-2x / IOB-3 and CON-2

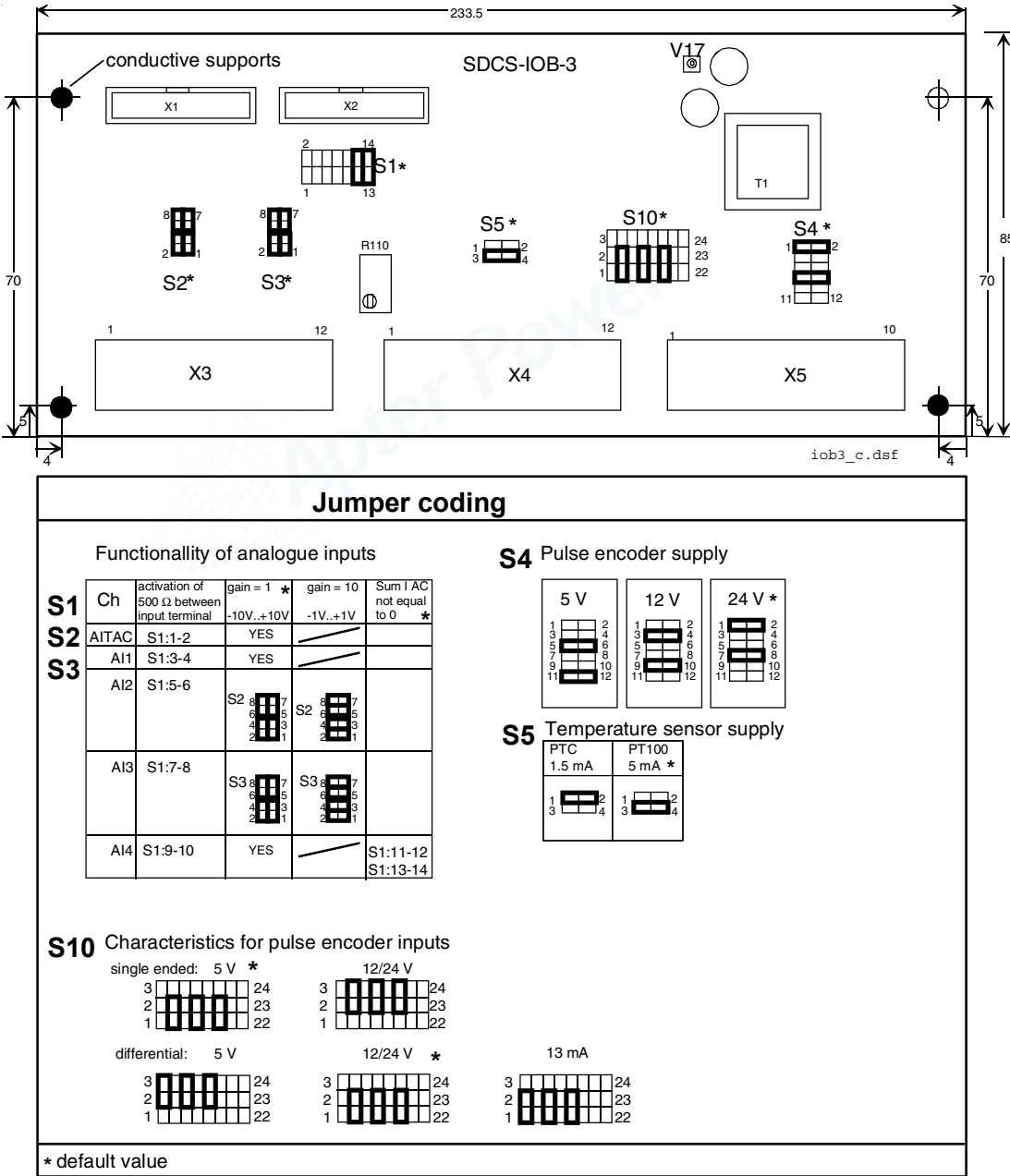


Fig. 6.2/2 Layout and jumper settings of the SDCS-IOB-3 board

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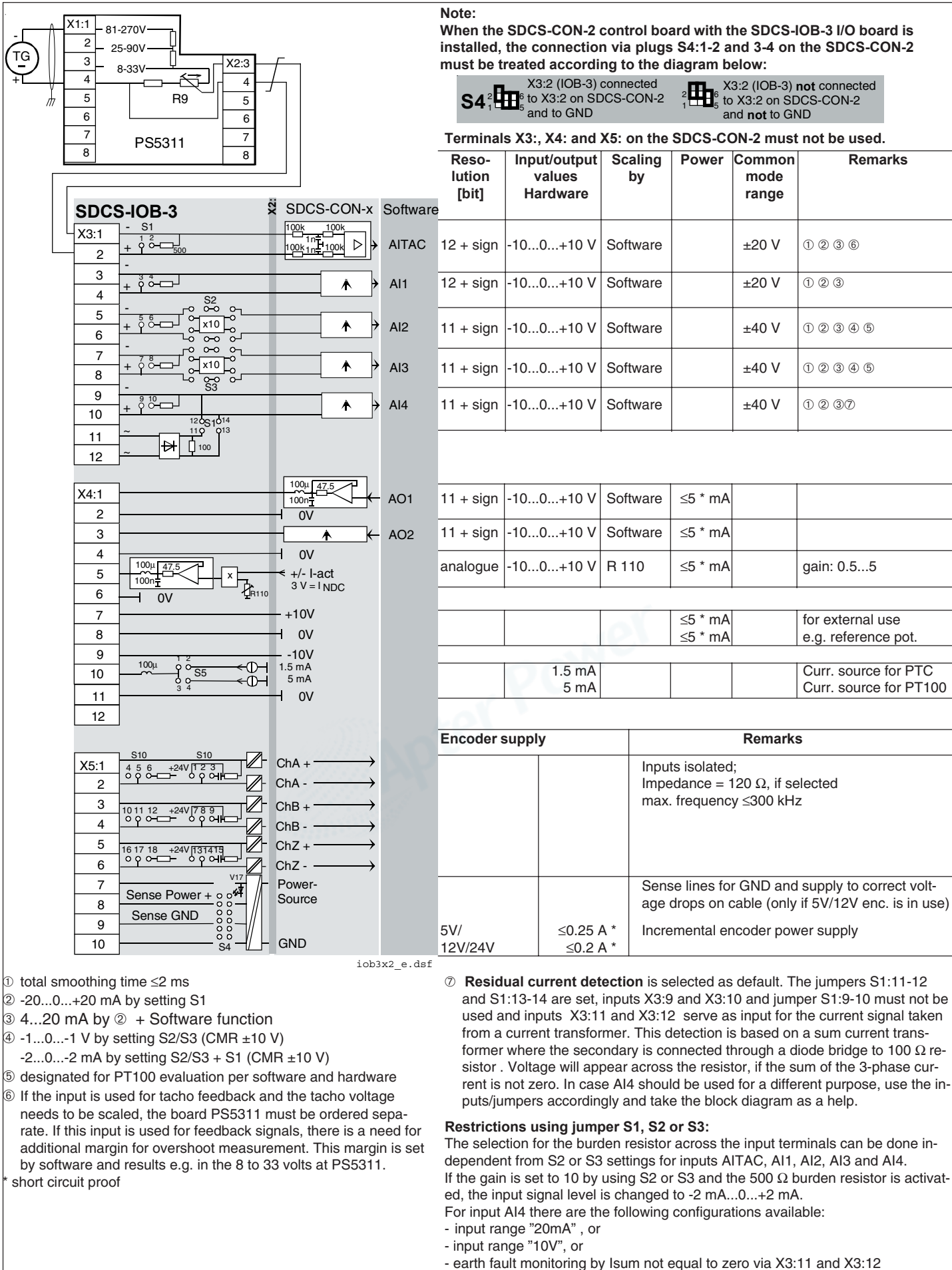


Fig. 6.2/3 Terminal connection of the SDCS-IOB-3 board

Connecting a pulse encoder to the DCS 500B / DCS 600 converter

The connection diagram for a pulse encoder to the electronics of a DCS converter is quite similar, if the SDCS-CON-2 or the SDCS-IOB-3 is used. The basic difference between these 2 boards is the galvanical isolated circuit on the SDCS-IOB-3 board.

Power supply for incremental encoder

There is a galvanically isolated power supply for the incremental encoder on SDCS-IOB-3. The jumper S4 on this board is used to select either +5 V, +12 V or +24 V as a supply voltage for the pulse encoder. When LED indicator (V17) is lit, the supply is OK. The pulses generated by the pulse encoder are transferred to the pulse receivers via opto couplers.

If the SDCS-CON-2 board is used the supply voltage for the pulse encoder is selected on the SDCS-POW-1 board (refer to SDCS-POW-1).

In both cases the voltage regulator has a feedback control with Sense power and Sense GND signals.

Feedback connection is recommended when power supply level for differential pulse encoder is 5V. If a 12 V pulse encoder type is in use the sense function is also available. The wiring is shown on figure 6.2/4.

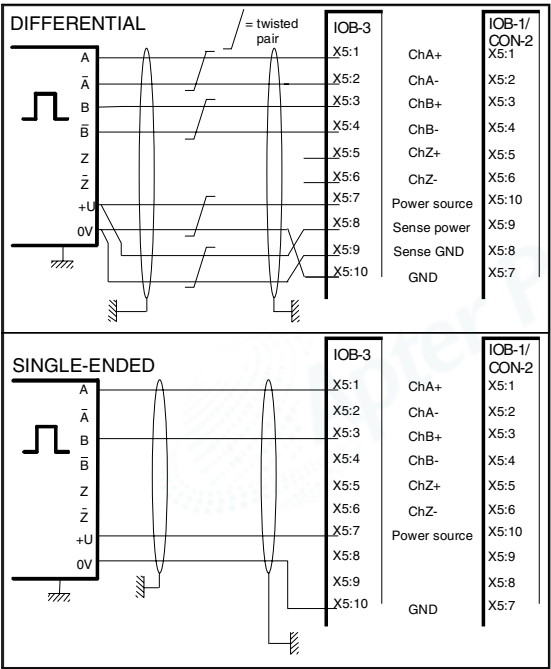


Fig. 6.2/4 Connections incremental encoder - electronics

Note: If the drive's direction of rotation is correct (if necessary, correct by exchanging the field connections), the **Tacho error** message may appear during start-up.

If with a positive reference the TACHO_PULSES signal (with software 21.xxx: parameter 12104) does not look like the illustration below, then tracks A and A-bar must be mutually exchanged with encoders with inverted signals, and tracks B and B-bar with encoders without inverted signals.

If the TACHO_PULSES signal is missing or non-linear, the encoder's pulses are not being read correctly. Possible reasons for this may be the encoder supply, the encoder itself, or the wiring.

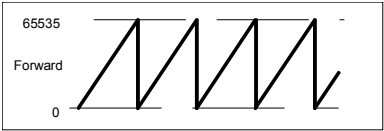


Fig. 6.2/5 TACHO_PULSES signal

Incremental encoder

Two different incremental encoder connections are available.

- differential connection; pulse encoders generating either voltage or current signals can be used
- single-ended (push pull) connection; voltage signals

Restrictions using jumper S1: or S10: depending on the board

Line termination via S1/S10: 2-3 / 8-9 / 14-15 should not be used at 12 V or 24 V encoders, because of the power consumption taken from the encoder. If a pulse encoder with a build in current source is used a burden resistor of 120 Ω is activated via jumper S1/ S10: 1-2 a.s.o.

If a single ended 12 V / 24 V encoder is used S1/S10 should be set to 5-6 / 11-12 / 17-18 according to the layouts of the boards. This setting results in an internal threshold of appr. 5 V.

In case of a single ended 5 V encoder the jumpers will be set to a neutral position S1/S10: 4-5 / 10-11 / 16-17. To get a threshold lower than 5 V each terminal X5:2 / X5:4 / X5:6 must be connected via a resistor R to GND according to the table below.

R	1 kΩ	1.5 Ω	2.2 kΩ
U _{thresh}	1.2 V	1.8 V	2.3 V

Make sure the threshold is half of the supply voltage and the minimum voltage of the encoder output (saturation voltage U_{CE} of a transistor).

Three differential inputs are reserved for connecting the pulse encoder. CH A and CH B are the normal pulse channels having nominal 90° phase shift between the channels.

The channel CH A- (CH B-) is the inversed channel CH A (CH B). CH Z is the zero pulse channel which can be additionally used if the encoder has an output giving one “zero” pulse per revolution.

The distance between pulse encoder and interface board is dependent on the voltage drop on the connecting lines and on the output and input configuration of the used components. If cables are used according to the next table the voltage drop caused by the cable can be corrected by the voltage regulator.

Cable length	parallel wires for power source & GND	Cable used
0 ... 50 m	1x 0.25 mm²	12x 0.25 mm²
50 ... 100 m	2x 0.25 mm²	12x 0.25 mm²
100 ... 150 m	3x 0.25 mm²	14x 0.25 mm²

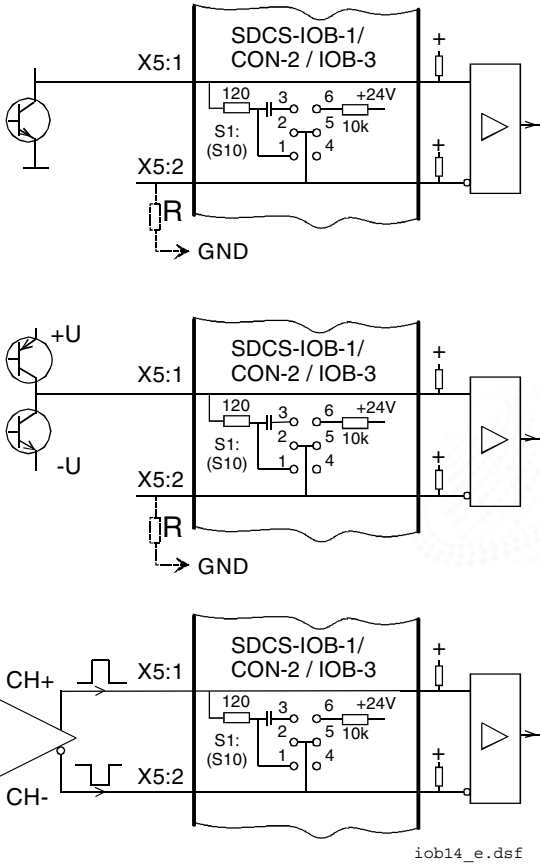


Fig. 6.2/6 Pulse encoder connection principles