Honeywell

Safety Manager
Hardware Reference

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The table below gives an example per group of modules. For each example module element the module name and function is given.

All groups of modules	Example module element	Module name and function
Chassis	CPCHAS-0002	Chassis for redundant Controller (Safety Manager A.R.T.)
Power supplies	PSU-UNI2450U	25—28 Vdc Power supply (1200 W) – UL508 approved
Control Processor modules	QPP-0002	Quad Processor Pack
	Note: The Power Supply module within this group is the exception to the rule. Naming of this module will be in line with the naming convention for Power supplis.	
Input modules	SDI-1624	Safe digital input module (24 Vdc, 16 channels)
Input converter modules	BSN-1608	Digital converter module for Safety sensor signals (16 channels)
Output modules	SDOL-0424	Safe loop-monitored digital output module (24 Vdc, 1 A, 4 channels)
Output converter modules	BSDOL-04UNI	Range setting module
Universal IO modules	RUSIO-3224	Remote Universal Safe IO device (32 channels, 24 Vdc)
IO busses	FS-IOBUS-CPIOX	IO bus in extension cabinet
FTAs for standard functions	TSAI-1620M	Safe 0-20 mA and 4-20 mA analog input FTA (16 channels)
FTAs for special functions	TSHART-1620M	Safe 0-20 mA and 4-20 mA analog input FTA with HART interface (16 channels)
FTAs for communication purposes	DCOM-232/485	RS232/485 communication FTA
IOTAs for remote applications	IOTA-R24	Redundant IO Termination Assembly
Field Terminal Solutions	TERM-NAMUR-01	NAMUR to 0-20mA analog-IN converter terminal
System Interconnection Cables	SICC-0001/L50	System Interconnection Cable terminating on FTAs (SICC)
Communication Cables	CCE-485-05/L10	External communication cable
Power distribution	PDB-0824P	Power Distribution Board (24Vdc, 2 Amp, 8 channel)
5V and watchdog distribution	PDC-CPX05	Power Distribution Board Controller cabinet (5 Vdc, Watchdog)

Figure 50 Back view of an open IOCHAS-0001S

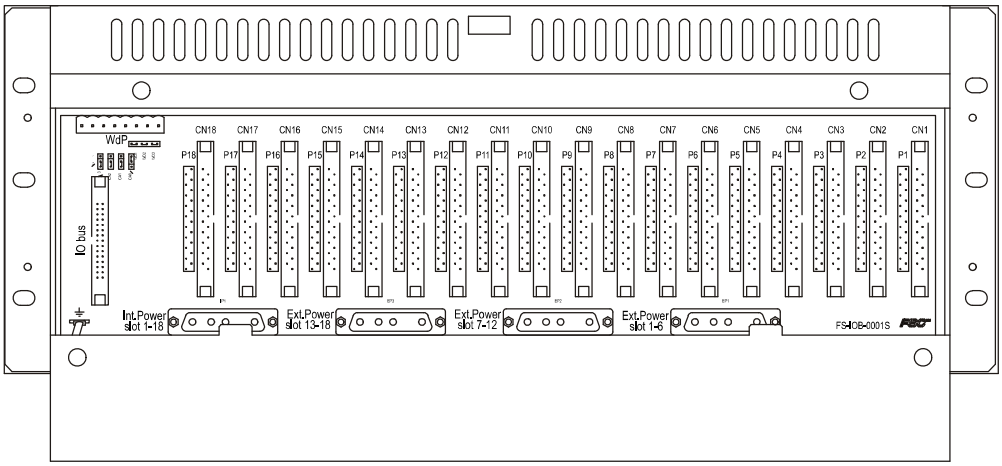

Table 10 Connectors on the IOB-0001S

Connector	Amount	Description	See
Front side			
48-pin female chassis connector	18	Connectors for IO modules, slot 1 to 18	“Input modules” on page 289 “Output modules” on page 343
48-pin female chassis connector	1	Connector for IO extender IO-0001, slot 21	“IO-0001” on page 479
Back side			
IO bus	1	Connector for IOBUS-CPIO (IO bus to Controller chassis)	“IOBUS-CPIO” on page 491
CN1 to CN18	18	Connector for system interconnection cables SICC-0001/Lx or SICP-0001/Lx, slot 1 to 18	“SICC-0001/Lx” on page 715 “SICP-0001/Lx” on page 718
P1 to P18	18	Connector for IO converter modules, slot 1 to 18	“Input converter modules” on page 321 “Output converter modules” on page 407
IP1	1	Connector for internal power, slot 1 to 18	Cable: FS-PDC-IOIP1, see “PDC-IOxPx” on page 809

Figure 57 back view of an open IOCHAS-0001R

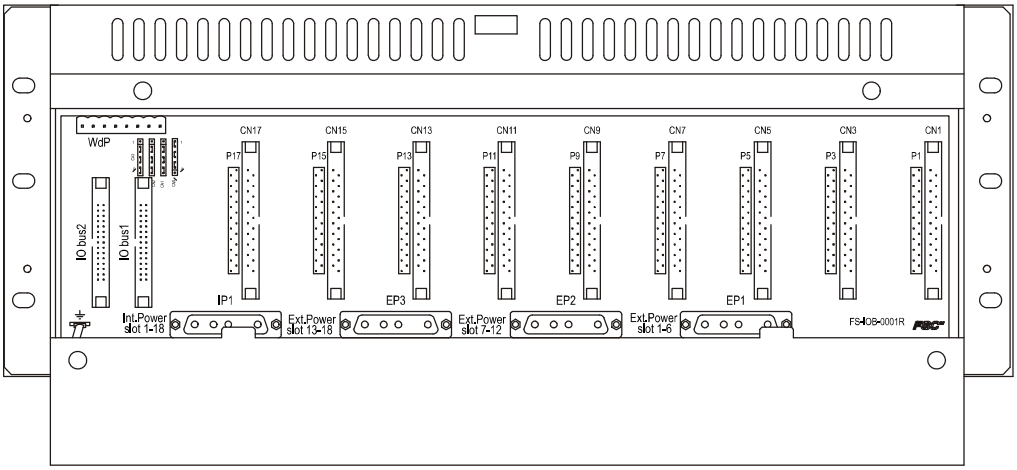

Table 14 Connectors on the IOB-0001R

Connector	Amount	Description	See
Front side			
48-pin female chassis connector	18	For IO modules, slot 1 to 18	“Input modules” on page 289 “Output modules” on page 343
48-pin female chassis connector	2	For IO extender IO-0001, slot 20 and 21	“IO-0001” on page 479
Back side			
IO bus1	1	For IOBUS-CPIO (IO bus to Control Processor 1)	“IOBUS-CPIO” on page 491
IO bus2	1	For IOBUS-CPIO (IO bus to Control Processor 2)	“IOBUS-CPIO” on page 491
CN1, CN3, CN5, CN7, CN9, CN11, CN13, CN15 and CN17	9	For system interconnection cables SICC-0001/Lx or SICP-0001/Lx, slot 1, 3, 5, 7, 9, 11, 13, 15 and 17	“SICC-0001/Lx” on page 715 “SICP-0001/Lx” on page 718
P1, P3, P5, P7, P9, P11, P13, P15 and P17	9	For IO converter modules, slot 1, 3, 5, 7, 9, 11, 13, 15, and 17	“Input converter modules” on page 321 “Output converter modules” on page 407
IP1	1	For internal power, slot 1 to 18	Cable: FS-PDC-IOIP1, see “PDC-IOxPx” on page 809

Figure 67 Back view of an open IOCHAS-0002S

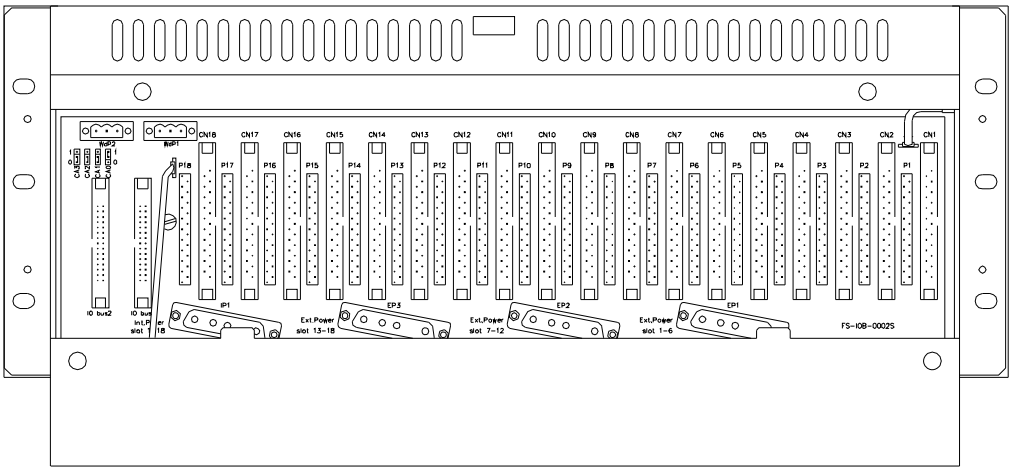

Table 20 Connectors on the IOB-0002S

Connector	Amount	Description	See
Front side			
48-pin female chassis connector	18	Connectors for IO modules, slot 1 to 18	“Input modules” on page 289 “Output modules” on page 343
55-pin male chassis connector	1	For IOBUS-HB2A, slot 19	page 133
8-pin male power chassis connector	2	For IO extender IO-0001, slot 20 and 21	“IO-0002” on page 488
120-pin female chassis connector	2	For IO extender IO-0002, slot 20 and 21	“IO-0002” on page 488
Back side			
IO bus1	1	For IOBUS-CPIO (IO bus 1 to controller chassis)	“IOBUS-CPIO” on page 491
IO bus2	1	For IOBUS-CPIO (IO bus 2 to controller chassis)	“IOBUS-CPIO” on page 491
CN1 to CN18	18	Connector for system interconnection cables SICC-0001/Lx or SICP-0001/Lx, slot 1 to 18	“SICC-0001/Lx” on page 715 “SICP-0001/Lx” on page 718

Figure 75 back view of an open IOCHAS-0002R

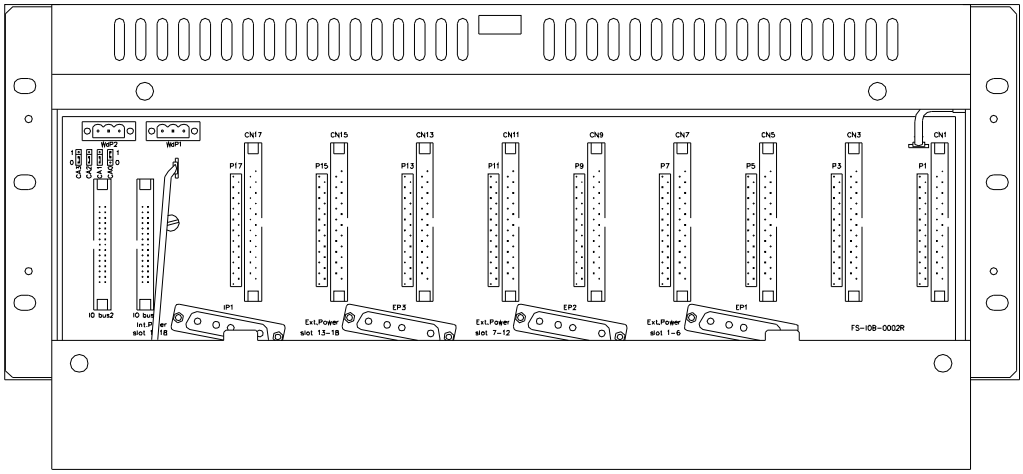

Table 23 Connectors on the IOB-0002R

Connector	Amount	Description	See
Front side			
48-pin female chassis connector	18	For IO modules, slot 1 to 18	“Input modules” on page 289 “Output modules” on page 343
55-pin male chassis connector	1	For IOBUS-HB2A, slot 19	page 142
8-pin male power chassis connector	2	For IO extender IO-0002, slot 20 and 21	“IO-0002” on page 488
120-pin male chassis connector	2	For IO extender IO-0002, slot 20 and 21	“IO-0002” on page 488
Back side			
IO bus1	1	For IOBUS-CPIO (IO bus 1 to controller chassis)	“IOBUS-CPIO” on page 491
IO bus2	1	For IOBUS-CPIO (IO bus 2 to controller chassis)	“IOBUS-CPIO” on page 491
CN1, CN3, CN5, CN7, CN9, CN11, CN13, CN15 and CN17	9	For system interconnection cables SICC-0001/Lx or SICP-0001/Lx, slot 1, 3, 5, 7, 9, 11, 13, 15 and 17	“SICC-0001/Lx” on page 715 “SICP-0001/Lx” on page 718

General info about Termination Assembly modules

Termination assembly modules are divided in two main groups:

- Field Termination Assembly (FTA) modules that are used in combination with SM chassis IO modules.
  See “FTA modules for SM chassis IO modules” on page 501.
- Termination Assembly modules that are used in combination SM universal IO modules.
  See “Termination Assembly modules for SM universal IO modules” on page 504.

FTA modules for SM chassis IO modules

This type of Field Termination Assembly (FTA) module is the interface between field components (e.g. sensors and valves) and chassis IO modules in Safety Manager.

FTA modules are connected to an IO module via a system interconnection cable (e.g. SICC-0001/Lx), which is plugged into the SIC connector on the FTA module.

Table 70 on page 501 and Table 71 on page 501 show the possible connections of field signals to IO modules.

Table 70 possible connections of input field signals to input modules

Input signals				
Field signal		SICP cable		Input module
Field signal		SICP cable	Input converter module	Input module
Field signal	FTA	SICC cable		Input module
Field signal	FTA	SICC cable	Input converter module	Input module

Table 71 possible connections of output field signals to output modules

Output signals				
Output module		SICP cable		Field signal
Output module	Output converter module	SICP cable		Field signal
Output module		SICC cable	FTA	Field signal
Output module	Output converter module	SICC cable	FTA	Field signal

TSDI-1624

Safe digital input FTA (24 Vdc, 16 channels)

Description

Field termination assembly module TSDI-1624 is the interface between system interconnection cable SICC-0001/Lx and the external field wiring (screw terminals). The SICC cable interconnects the SIC connector on the FTA module and a (redundant pair of) SDI-1624 modules.

The TSDI-1624 module can interface with digital input signals from ‘Class I, Division 2 Hazardous Locations’.

The TSDI-1624 module can handle short circuits to 0 Volt of (INx+ or INx) field wires because the PTC (Positive Temperature Coefficient) resistor between the +24Vout of the SDI-1624 modules and the ‘+24Vout’ connection (INx+) of each input channel limits the current. This prevents the loss of all 16 channels (+24Vout fails) in the case of a single short circuit to 0 Volt of a connected field wire.

The FTA module has a universal snap-in provision for standard DIN EN rails and screw terminals for connecting field wiring.

System interconnection cables

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This chapter describes the following items:

General info about System Interconnection Cables (SIC)

System Interconnection Cables (SIC) are divided in these main groups:

- SIC to connect SM chassis IO to FTAs.
  See “SIC for SM chassis IO” on page 712.
- SIC to connect CP backplane to external contact.
  See “SIC for CP backplane” on page 714.
- SIC to connect SM universal IO to FTAs.
  See “SIC for SM universal IO” on page 714.

SIC for SM chassis IO

This type of System Interconnection Cable (SIC) transports field signals to SM chassis IO modules. Depending on whether or not an FTA is used in the configuration, you either use a SICC cable, or a SICP cable. Refer to Table 79 on page 712 for input signals and Table 80 on page 712 for output signals.

Table 79 possible ways to connect input field signals to input modules
(read table from left to right to see possible interface/wiring options)

Input Signals				
Field signal		SICP cable		Input module
Field signal		SICP cable	Input converter module	Input module
Field signal	FTA	SICC cable		Input module
Field signal	FTA	SICC cable	Input converter module	Input module

Table 80 possible ways to connect output field signals to output modules
(read table from left to right to see possible interface/wiring options)

Output Signals				
Output module		SICP cable		Field signal
Output module	Output converter module	SICP cable		Field signal
Output module		SICC cable	FTA	Field signal
Output module	Output converter module	SICC cable	FTA	Field signal

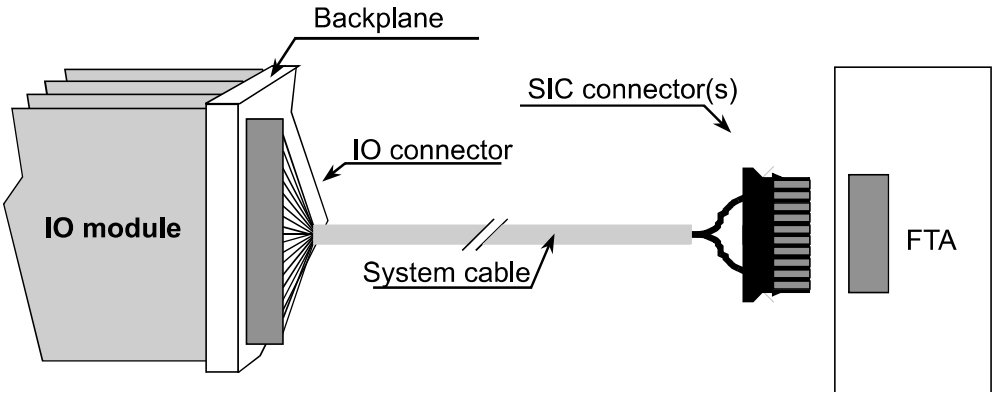
At the back plane side each of the above mentioned connection methods uses an IO-connector.

At the field signal side:

- SICC cables connect to an FTA with a special (20-pins) FTA-connector; the connection principle for this method is shown in Figure 447 on page 713,
- SICP cables connect directly to field signals with 20 wires (crimp pins); the connection principle for this method is shown in Figure 448 on page 713.

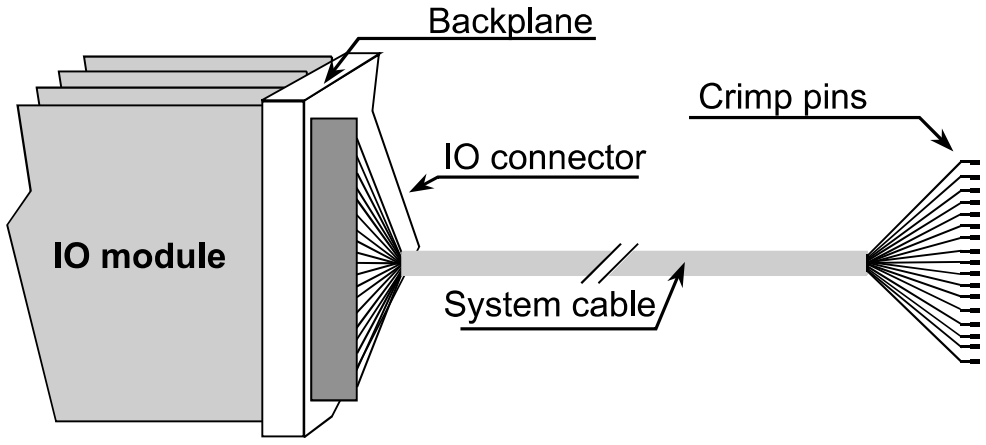
Connection principles

Figure 447 Principle of SICC connection method



The wiring method that uses SIC cables terminating on crimp pins (SICP) is shown in Figure 448 on page 713.

Figure 448 Principle of SICP connection method



Related topic(s): “SICC-0001/Lx” on page 715
“SICP-0001/Lx” on page 718

SIC for CP backplane

This type of System Interconnection Cable (SIC) is used to connect one or more inputs on the CP backplane with external (potential free) contacts.

Related topic(s): “SICP-0002/L3” on page 722

SIC for SM universal IO

This type of System Interconnection Cable (SIC) transports field signals to SM universersal IO modules.

Related topic(s): “SICC-1002/Lx” on page 725
“SICC-2001/Lx” on page 728
“CA-HWC300-AIO-DIO-xM” on page 731

SICC-0001/Lx

System Interconnection Cable for chassis IO terminating on FTAs (SICC)

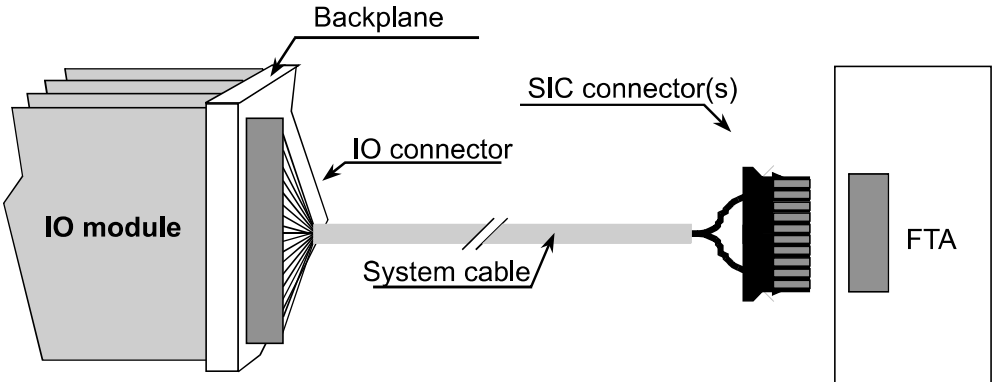
Description

System interconnection cables - for SM chassis IO - with termination to Field Termination Assemblies (FTA) can connect Safety Manager IO modules to FTAs (via an IO backplane). Figure 449 on page 715 illustrates this process. These cables are called SICC cables and have one IO connector on one end and one 20-pin FTA connector on the other end.

Connection principles

The wiring method for SIC cables terminating on FTAs (SICC) is shown in Figure 449 on page 715.

Figure 449 Principle of SICC connection method



Technical data

System interconnection cables terminating on FTAs have the following specifications:

General	Type number:	FS-SICC-0001/Lx (where × = length)
	Cable type:	20 × AWG 22 (= 0.34 mm²) double shielded
	Outer diameter (nominal):	9.93 mm / 0.39 in
	Available lengths:	× = 3.25 m, 5 m, 6 m, 8 m, 10 m, 15 m, 20 m, 25 m and 30 m.

SICC Cable connections

This tables gives an overview of all possible connections of FTAs to input and output modules.

Table 81 Connections for standard SICC-0001/Lx cable to input modules

Signal				Connector pin	
SDI-1624 SDI-1648	SAI-0410	SAI-1620m	SDIL-1608	IO module	FTA
		Shield		41	–
0 Vdc	IN1-	0 Volt	0 Volt	40	A10
0 Vdc	IN1+	0 Volt	0 Volt	37	B10
IN1		IN1	IN1	36	A9
IN2		IN2	IN2	33	B9
IN3		IN3	IN3	32	A8
IN4		IN4	IN4	29	B8
IN5		IN5	IN5	28	A7
IN6		IN6	IN6	25	B7
IN7	IN2+	IN7	IN7	24	A6
IN8	IN2-	IN8	IN8	21	B6
IN9	IN3-	IN9	IN9	20	A5
IN10	IN3+	IN10	IN10	17	B5
IN11		IN11	IN11	16	A4
IN12		IN12	IN12	13	B4
IN13		IN13	IN13	12	A3
IN14		IN14	IN14	9	B3
IN15		IN15	IN15	8	A2
IN16		IN16	IN16	5	B2
+ Vext	IN4+	0 Volt	+ Vext (8 Vdc)	4	A1
+ Vext	IN4-	+ Vext/8	Earth	1	B1

Table 82 Connections for standard SICC-0001/Lx cable to output modules

Signal								Connector pin	
SDO-0824	SAO-0220m	DO-1224	RO-1024	DO-1624	SDO-04110 SDO-0448	SDO-0424	SDOL-0424	IO module	FTA
–	Shield	–	–	–	–	–	–	41	–
(0 Vdc)	–	–	OUT1 c	–	–	–	–	40	A10
(0 Vdc)	–	–	OUT1 no	–	–	–	–	37	B10
OUT1+	–	OUT1	OUT2 c	OUT1	(0 Vdc)	OUT1+	(0 Vdc)	36	A9
OUT1–	–	OUT2	OUT2 no	OUT2	(0 Vdc)	OUT1–	(0 Vdc)	33	B9
OUT2+	0V (1)	OUT3	OUT3 c	OUT3	OUT1+	OUT1+	OUT1+	32	A8
OUT 2–	–	OUT4	OUT3 no	OUT4	OUT1–	OUT1–	OUT1-	29	B8
OUT3+	mA1	OUT5	OUT4 c	OUT5	0 Vdc	OUT2+	(0 Vdc)	28	A7
OUT3–	Loop1	OUT6	OUT4 no	OUT6	(0 Vdc)	OUT2–	(0 Vdc)	25	B7
OUT4+	–	OUT7	OUT5 c	OUT7	OUT2+	OUT2+	OUT2+	24	A6
OUT4–	–	OUT8	OUT5 no	OUT8	OUT2–	OUT2–	OUT2-	21	B6
OUT5+	0V (2)	OUT9	OUT6 c	OUT9	(0 Vdc)	OUT3+	(0 Vdc)	20	A5
OUT5–	–	OUT10	OUT6 no	OUT10	(0 Vdc)	OUT3–	(0 Vdc)	17	B5
OUT6+	mA2	OUT11	OUT7 c	OUT11	OUT3+	OUT3+	OUT3+	16	A4
OUT6–	Loop2	OUT12	OUT7 no	OUT12	OUT3–	OUT3–	OUT3-	13	B4
OUT7+	–	0 Vdc	OUT8 c	OUT13	(0 Vdc)	OUT4+	(0 Vdc)	12	A3
OUT7–	–	0 Vdc	OUT8 no	OUT14	(0 Vdc)	OUT4–	(0 Vdc)	9	B3
OUT8+	–	0 Vdc	OUT9 c	OUT15	OUT4+	OUT4+	OUT4+	8	A2
OUT8–	–	0 Vdc	OUT9 no	OUT16	OUT4–	OUT4–	OUT4-	5	B2
(0 Vdc)	–	0 Vdc	OUT10 c	0 Vdc	(0 Vdc)	(0 Vdc)	(0 Vdc)	4	A1
(0 Vdc)	–	0 Vdc	OUT10 no	0 Vdc	(0 Vdc)	(0 Vdc)	(0 Vdc)	1	B1