



F 3349: 8-channel output module

safety-related, applicable up to SIL 3 according to IEC 61508

- resistive or inductive load up to 500 mA (at L+ 24 V or 48 V)
- lamp load up to 10 W
- with integrated safety shutdown
- with safe isolation, with line monitoring

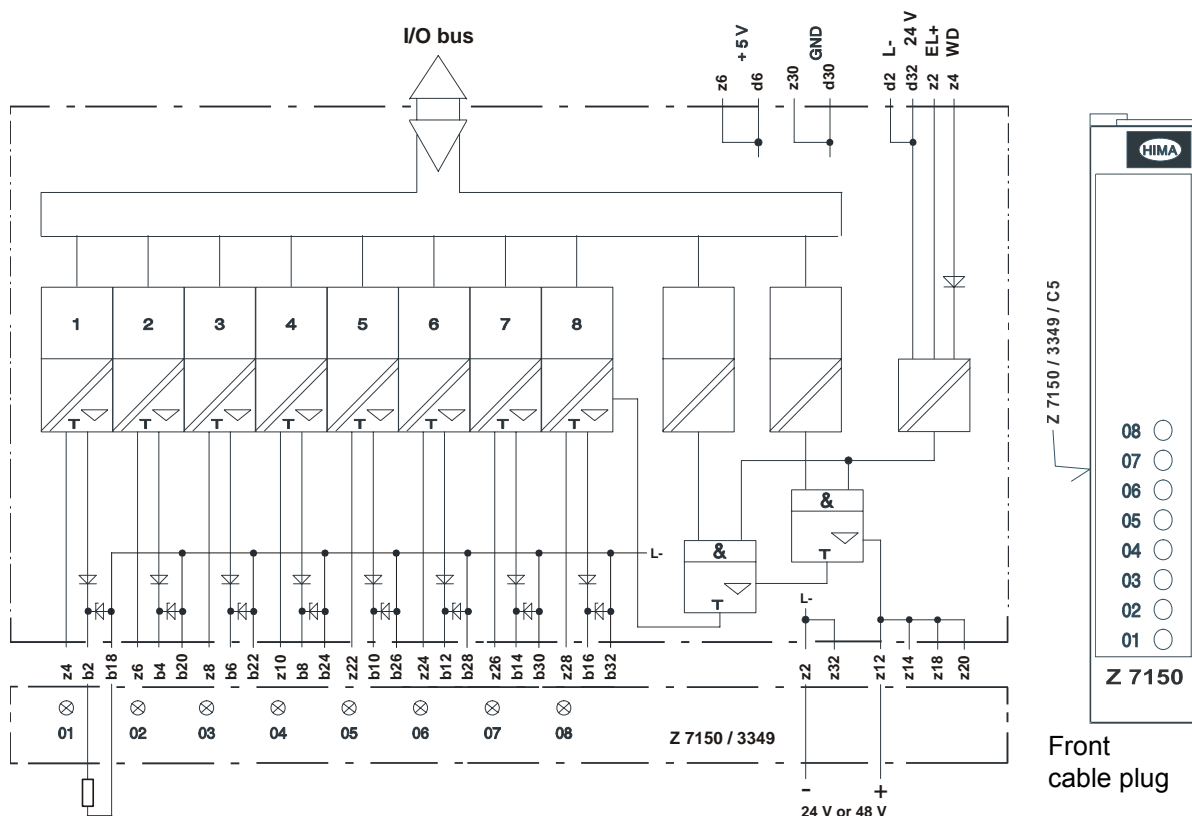


Figure 1: Block diagram and front cable plug

Appertaining function block: HB-BLD-3 or HB-BLD-4

The module is automatically tested during operation. The main test routines are:

- Reading back of the output signals. The operating point of the 0-signal read back is ≤ 6.5 V,
- Switching capability of the safety shutdown, cross-talking (walking-bit test),
- Line monitoring.

Nominal output voltage	24 V or 48 V, acc. to supply of L+ via cable plug, 500 mA, short-circuit-proof
Space requirement	4 SU
Operating data	5 VDC / 0.15 A, 24 VDC / 200 mA (via rear bus system) 24/48 VDC / 50 mA plus load (via cable plug)

Cable plug for outputs 24 VDC

Channel	Connection	Color	
1	b2	BN	Cable LiYY 16 x 0.5 mm ²
	b18	WH	
2	b4	YE	
	b20	GN	
3	b6	PK	
	b22	GY	
4	b8	RD	
	b24	BU	
5	b10	VT	
	b26	BK	
6	b12	WHGN	
	b28	WHBN	
7	b14	WHGY	
	b30	WHYE	
8	b16	WHBU	
	b32	WHPK	
L- 24 V	z2	BK	Flat pin plug 6.3 x 0.8 mm Wire: q = 1 mm ² , l = 750 mm
L+ 24 V	z12	RD	

Lead marking of the cable plug Z 7150 / 3349 / C5 / 24P2
2-pole connection of the load

Figure 2: Lead marking of the cable plug for outputs 24 VDC

Cable plug for outputs 48 VDC

Channel	Connection	Color	
1	b2	BN	Cable LiYY 16 x 0.5 mm ²
	b18	WH	
2	b4	YE	
	b20	GN	
3	b6	PK	
	b22	GY	
4	b8	RD	
	b24	BU	
5	b10	VT	
	b26	BK	
6	b12	WHGN	
	b28	WHBN	
7	b14	WHGY	
	b30	WHYE	
8	b16	WHBU	
	b32	WHPK	
-48 V	z2	BN	Cable LiYY 2 x 1 mm ²
+48 V	z12	WH	

Lead marking of the cable plug Z 7150 / 3349 / C5 / 48P2
2-pole connection of the load

Figure 3: Lead marking of the cable plug for outputs 48 VDC

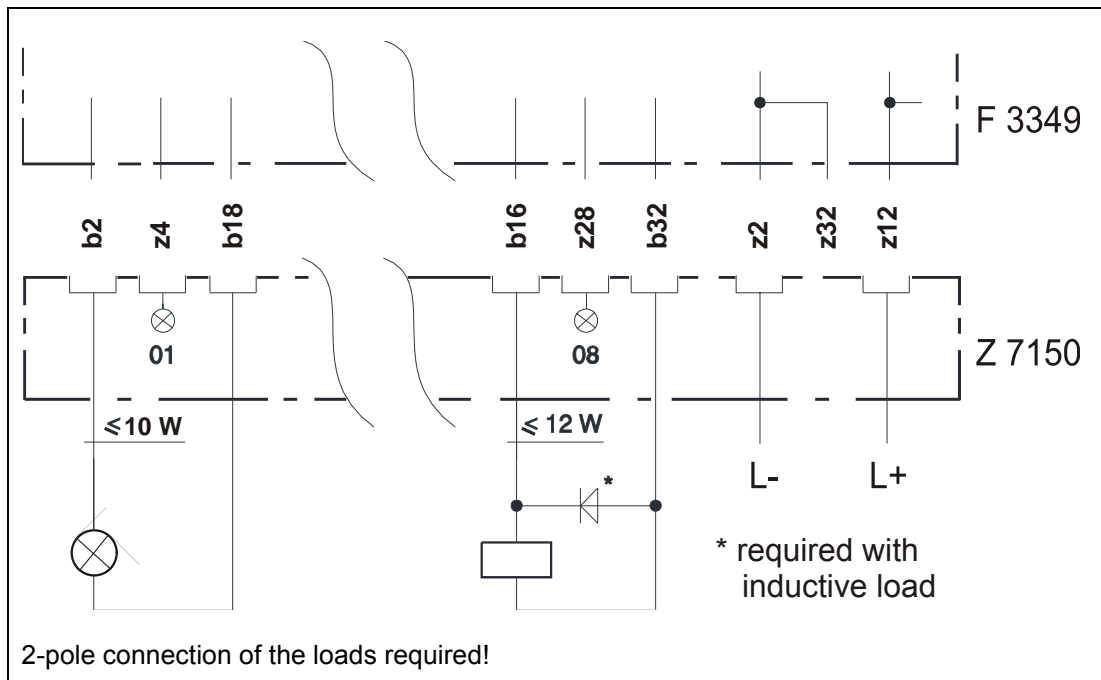


Figure 4: 2-pole connection

Additional technical data

Current input WD	1 mA
Monitored switching time	max. 200 μ s (without extension by the function block)
Internal voltage drop	max. 2 V at 500 mA load
Admissible line resistance	max. 11 Ω
max. lamp load	10 W
max. inductivity	1 H
max. capacity	100 μ F
Output leakage current	max. 500 μ A
Operating points of the line monitoring	
Line short-circuit	0.7...0.8 A
Line break	2...8 mA

Reaction of the module to errors

- Module error:
All outputs are switched off.
- Line error:
If an external line break or a short-circuit is detected, the module only makes an annunciation to the corresponding central module.
At a short-circuit and an overcurrent (> 2 A per channel) the overcurrent tripping is activated after 50 ms at the latest. For smaller overloads (> 0.7 A per channel) the reaction time can last up to several seconds.
At line errors the channel of the module is reconnected again after approx. 4.5 seconds.
- The error codes for the module are shown in the display of the corresponding central module. For further information see operating system manual.

Planning notes



The function block HB-BLD-3 (for single channel operation) or HB-BLD-4 (for redundant operation) must be used for all applications with the module.

- In case of line monitoring the appertaining function blocks HB-BLD-3 (for single channel operation) or HB-BLD-4 (for redundant operation) enable enhanced configuration possibilities for the module.
- The extension of the time for the inrush current for lamp loads by the appertaining function block is valid for all channels. So inductive and lamp loads may not be operated on *one* module at the same time.
- The line break monitoring requires an output load of at least 10 mA.
- The short-circuit and line break can be evaluated in the user program as line faults by means of the function blocks HB-BLD-3 or HB-BLD-4. The evaluation of the signal "line break" is made up to SIL 1.
- The outputs of the module and their supply voltage must be connected with *two poles*. The use of common lines can produce coupling loops with interferences, leading to a module fault or a failure of the safety shutdown of the outputs.
- The outputs can be connected in parallel without additional external decoupling diodes.
- An external short-circuit of a channel does not trigger the integrated safety shutdown, i.e. the remaining channels continue their function.
- If the line is longer than 10 m or if a power supply unit not manufactured by HIMA is used, for a faultless operation with 48 V the supply voltage must be filtered with an additional module Z 6019.
- Lines for outputs not used may not be extended to the plant without any terminal loads.
- In one I/O subrack max. 10 output modules with nominal load may be used at the same time.
- At maximum power dissipation a forced cooling with a fan module is required.

Note for the redundant use of modules

- In case of a line short-circuit the double current can flow, until this line short-circuit is diagnosed.
- In case of a line break the required minimum current is twice the value (20 mA) to prevent an indication of a line break.

Note

The connection of capacitive loads is not permitted. A length of the connection line up to 3 km is possible. The line capacity, however, is limited to a maximum of 1 μ F.

With an interruption of the supply line L- the safe shutdown of the outputs is no longer ensured.
