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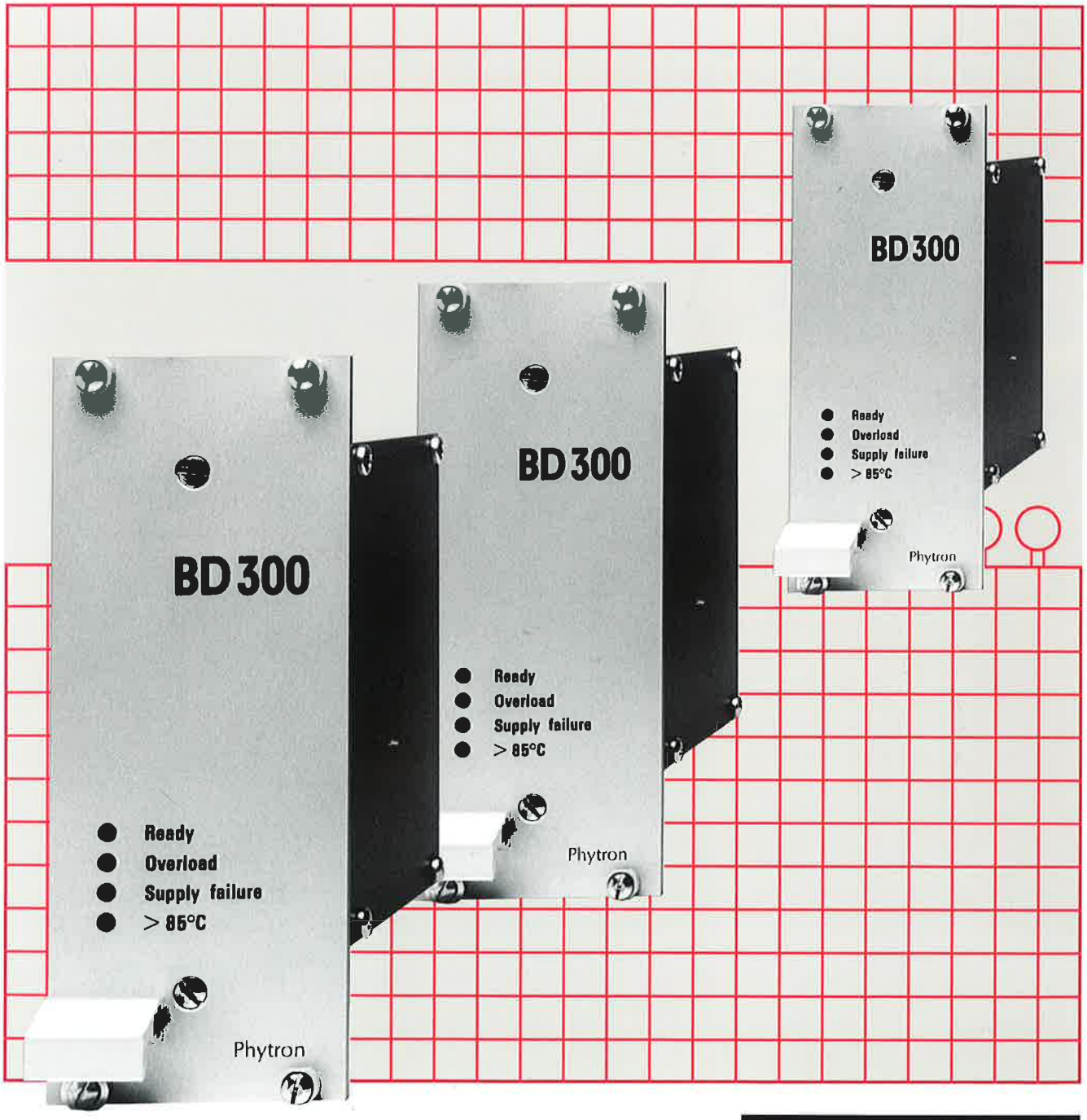
BD 300
Bipolar stepper motor power stage



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General:

The type BD 300 is a bipolar, chopped stepper motor drive for 2-phase stepper motors in 4-lead or 8-lead connection (it can be used for some stepper motors in 6-lead connections: refer to the BD 300 manual).

The BD 300 is adjustable for full-step or half-step mode with or without torque compensation.

The maximum input frequency is 40 kHz.

Motor run and stop currents are individually adjustable by 16-step DIP switches. The maximum motor current is 3.4 A.

The boost functions and input activation is also programmed by DIP switches, or externally controlled.

The output driver stage is short-circuit proof to/and between the phases. It operates with a fixed chopper frequency of 20 kHz, therefore the motor is noiseless during standstill, and the run noises are limited to a minimum.

The power supply is built in, therefore for supply of current only a mains transformer is required.

It is also possible to drive the unit with a DC current.

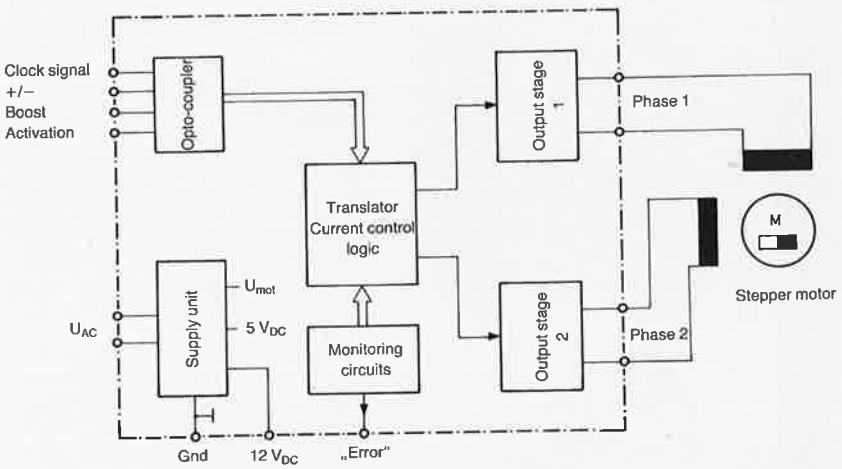
The unit is easy to install, various monitoring functions allow error diagnosis if a defect arises.
Red front panel LEDs display the defect location (refer to right section).
All error signals are routed to a common output for direct connection to either a LED or an optocoupler device.

All inputs are opto-insulated, this provides high common mode rejection between the control and power circuit within the unit.

The heat sink and the front panel are potential-free.

Detailed information is given in the BD 300 manual.

Block diagram



Error signals:

1. "Overload"

Caused by:
Short-circuit on or between the phases

or

Sudden lack of trigger pulses at high pulse rates

or

Delay during deceleration is too high (stepper motor looses steps, but still operates as a generator)

2. "Supply failure"

Internal supply unit defective

3. "Overtemperature > 85°C"

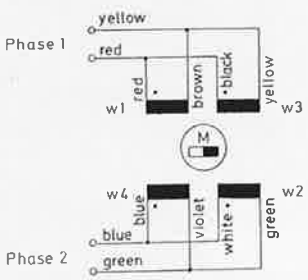
The temperature of the heat sinks has risen above 85°C.

Stepper motor:

The BD 300 is used to drive PHYTRON stepper motors series ZSS 19 to ZSS 57 and ZSL.

The BD 300 can also drive other stepper motors in 4- or 8-lead connection, and can be used to drive some of the 6-lead connected stepper motors.

PHYTRON stepper motor connection



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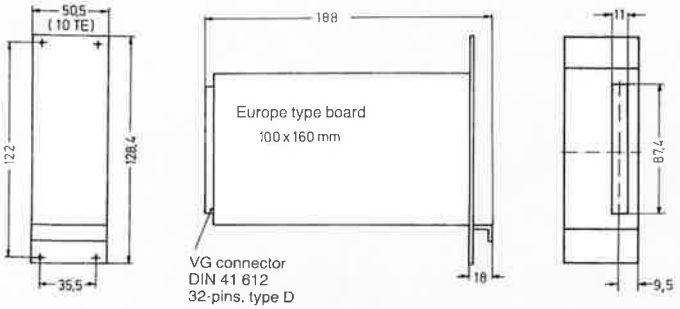
Dimensions:



Construction:

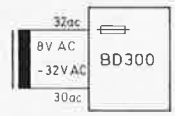
- Compact Europe type board, size: 100 × 160 mm with VG connector DIN 41 612, 32-pin, type D

Accessoires:

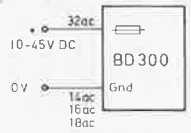
- Aluminium front panel 10 TE width = 50.5 mm 2.5 mm thickness, with handle
- Adapted connector to VG connector DIN 41 612

Technical Characteristics

Power supply	8 to 32 V AC / 3 A max.
Motor current	
	2 Phases energized / 1 Phase energized
without boost	2 A max. / 2.6 A max.
with boost	2.6 A max. / 3.4 A max.
	The motor current can be adjusted by means of 16-step DIP switches. Run and stop current are individually adjustable.
Inputs	All inputs are insulated with opto-couplers, with a series resistor (300 Ω) for 5 V DC supply. - Clock signal - +/- (motor rotation) - Boost (motor current elevation by about 30%) - Activation (motor current ON or OFF) Boost and activation can be selected on the board by means of DIP switches.
Error Output	Open collector output 24 V_{DC} / 30 mA - Overload or motor short-circuit - supply unit defect (internal DC supply > 10 V_{DC} or > 45 V_{DC}) - Overtemperature (Temperature of heat sink > 85°C) The error signal is a "high" level signal. The error type is displayed by a LED. When the error signal is activated, the motor current is cut-off and can only be activated again when the unit is switched OFF and the defect eliminated.
+ 12 V DC output	For connection of LEDs or opto-couplers in combination with the "error" output.
Operating temperature	0 to +45°C (without fan)

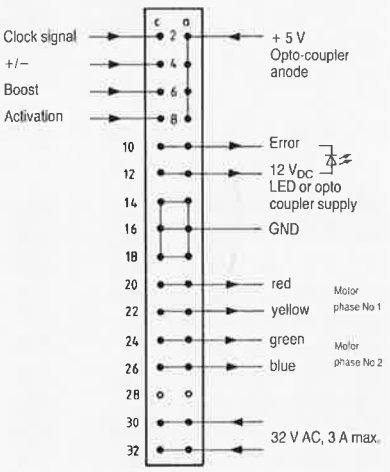


AC supply



DC supply

Pin assignment:



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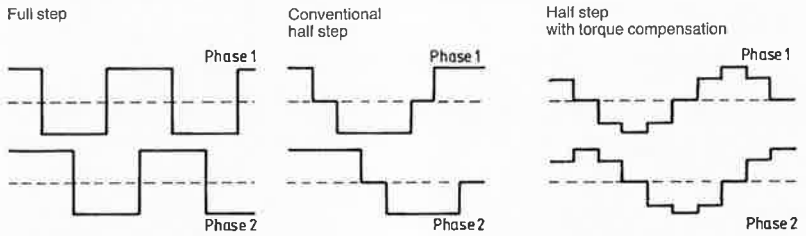
Operating modes of the BD 300

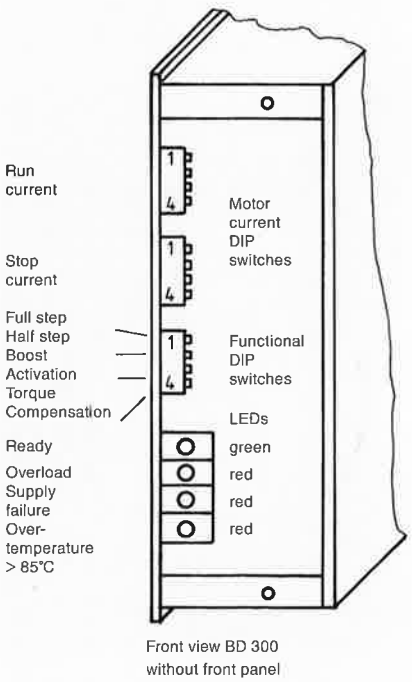


Operation modes adjustment

Conventional full step	S1 = ON S4 = ON
Conventional half step	S1 = OFF S4 = ON
Half step with torque compensation	S1 = OFF S4 = OFF
Boost	S2 = ON
Activation	S3 = ON

Motor current adjustment

DIP switches				Half step or conventional full step		Half step with torque compensation			
				without Boost	with Boost	without Boost		with Boost	
						2 phases energized	1 phase energized	2 phases energized	1 phase energized
				I_{ph}	I_{ph}	I_{ph}	I_{ph}	I_{ph}	I_{ph}
1	2	3	4	A	A	A	A	A	A
OFF	OFF	OFF	OFF	0	0	0	0	0	0
ON	OFF	OFF	OFF	0,25	0,3	0,17	0,25	0,25	0,3
OFF	ON	OFF	OFF	0,45	0,56	0,33	0,45	0,45	0,56
ON	ON	OFF	OFF	0,62	0,8	0,48	0,62	0,62	0,8
OFF	OFF	ON	OFF	0,8	1	0,6	0,8	0,8	1
ON	OFF	ON	OFF	1	1,2	0,8	1	1	1,2
OFF	ON	ON	OFF	1,15	1,4	0,9	1,15	1,15	1,4
ON	ON	ON	OFF	1,3	1,6	1	1,3	1,3	1,6
OFF	OFF	OFF	ON	1,45	1,85	1,1	1,45	1,45	1,85
ON	OFF	OFF	ON	1,6	2,1	1,25	1,6	1,6	2,1
OFF	ON	OFF	ON	1,8	2,3	1,4	1,8	1,8	2,3
ON	ON	OFF	ON	1,95	2,5	1,5	1,95	1,95	2,5
OFF	OFF	ON	ON	2,1	2,7	1,6	2,1	2,1	2,7
ON	OFF	ON	ON	2,3	3	1,75	2,3	2,3	3
OFF	ON	ON	ON	2,5	3,2	1,85	2,5	2,5	3,2
ON	ON	ON	ON	2,6	3,4	2	2,6	2,6	3,4



Front view BD 300 without front panel

BD 300/2R/93-1 GB

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