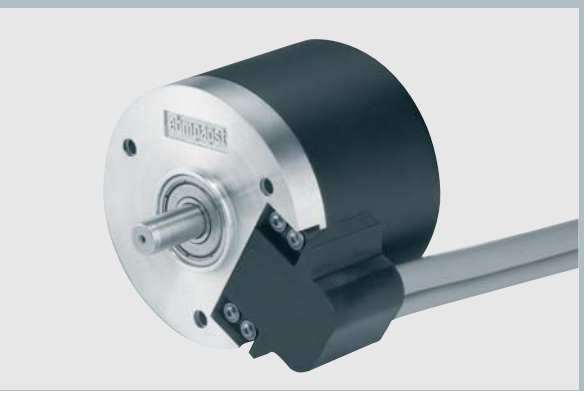
VARIODRIVE Compact motor

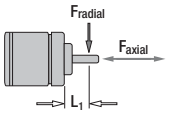
VDC-3-49.15



– 3-phase external rotor motor in EC technology.
– Rotor with multi-pole magnetised neodymium magnet.
– High power density with compact model.
– Integrated operating electronics with high-performance DSP.
– Excellent control behaviour with field-oriented control with sinus commutation.
– Extensive interface for variety of functions and operating mode selection.
– Overload protection with integrated temperature shutoff.
– Robust mechanical design with aluminium cover and sealed connector system.

Nominal data

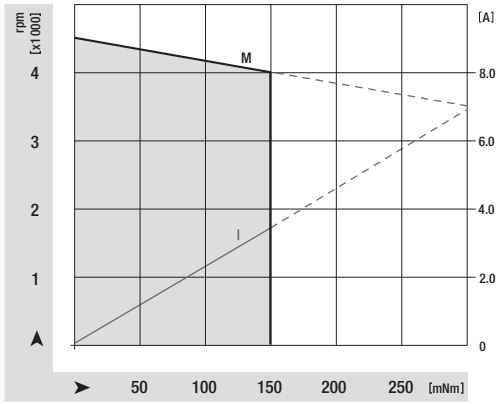
Type		VDC-3-49.15 24 V	… 48 V
Nominal voltage (U_{BN})	V DC	24 (18 … 30)	48 (18 … 55)
Nominal speed (n_N)	rpm	4000	4000
Nominal torque (M_N)	mNm	150	250
Nominal current (I_{BN})	A	3.5	2.9
Nominal output power (P_N)	W	63	105
Free-running speed (n_L)	rpm	4400	4500
Free-running current (I_{BL})	A	0.22	0.15
Max. reverse voltage	V DC	35	60
Set value input	V DC	0 … 10	0 … 10
Maximum speed	rpm	0 … 5000	0 … 5000
Recommended speed control range	rpm	0 … 4000	0 … 4000
Function for motor-protection at stall		yes	yes
Torque limitation to M_N		M_N	M_N
Overload protection		yes	yes
Temperature shut-off (via electronics)		110 °C off/on after acknowledgement of “C” hardware enable (< 100 °C)	
Starting torque	mNm	300	500
Rotor moment of inertia (J_R)	kgm^2x10^{-6}	108	108
Thermal resistance (R_{th})	K/W	–	–
Protection class		IP 54*	IP 54*
Ambient temperature range (T_U)	°C	0 … +40	0 … +40
Motor mass (m)	kg	0.72	0.72
Order No.		937 4915 600	937 4915 607

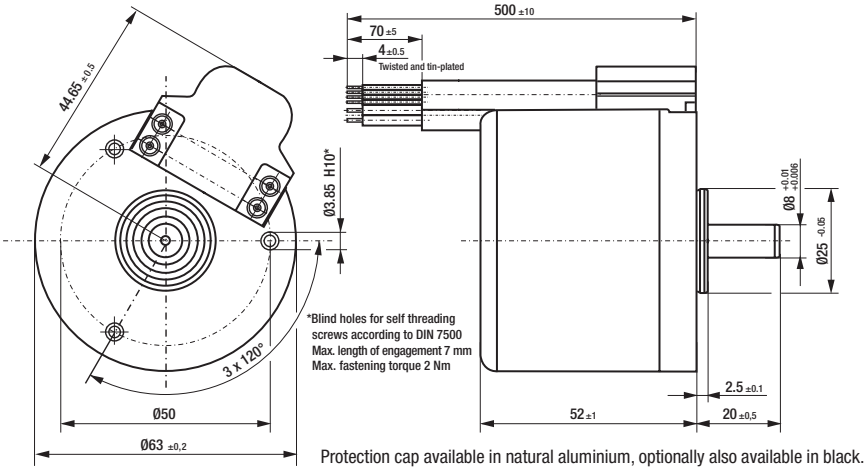


F_{axial} 20 N
F_{radial} 60 N L_1 10 mm

Permissible shaft load at nominal speed and life expectancy L_{10} of 20000 h.

*Classification of protection class refers to installed state with sealing on the flange side.





Protection cap available in natural aluminium, optionally also available in black.

Basic functions:

– Closed loop speed control with analogue set value input.
– Control of speed n = 0 rpm with holding torque.
– Extended motor dynamics based on short-term peak current with I^2t peak current limitation.
– Torque limitation via analogue set value input (for current limitation).
– Control input for hardware enable for safe switch-on after safety shut-off.
– Separate signal output with TTL level for information on direction of rotation.
– Signal output for status display of the drive via TTL level (drive ready yes/no).
– Separate power supply for motor logic (logic power supply can remain active even when motor is switched off).

Pin configuration

Colour	Function	Description	Connection*
Blue (1,5 mm²)	Gnd	Supply Ground	Yes
Brown (1,5 mm²)	+Ub	Logic supply voltage	Yes
Black (1,5 mm²)	UZK	Supply voltage	Yes
Blue	Gnd	Logic Ground	Yes**
Pink	S1	0 … 10 V – speed control set value input	Yes
Green	TXD	Communication / programming interface	No
White	RXD	Communication / programming interface	No
Grey-pink	A	Control input A, TTL level	Yes
Violet	B	Control input B, TTL level	Yes
Grey	IST	Actual speed value 1	Yes
Red-blue	F+	Set value input for frequency signal	No
Brown	S2	0 … 5 V current limitation (torque)	Yes
Black	C	Control input C – hardware enable	Yes
Red	E	Actual speed value 2	Yes
Yellow	D	Status of the drive	Yes

*Connections marked "No" must not be occupied when carrying out basic functions.
**When using only one power supply the 2 blue leads must be connected to the same Ground.

Other options on request:

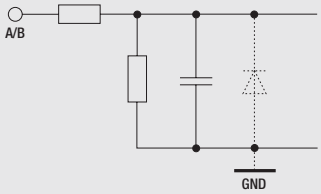
– Set value input for closed loop speed control operation via set value frequency or PWM signal.
– Input for set value for specifying driving profiles.
– Programming of the I^2t peak current limitation.
– 2-channel encoder signal with up to 100 pulses/ revolution via programmable division ratio of the actual value output between both outputs.
– Torque monitor with actual value output optionally either as analogue voltage, frequency or PWM signal.
– Electrically isolated inputs and outputs.
– Control inputs A and B for direction of rotation and brake function with line break detection.
– Position control of the drive.
– RS-485 interface as open communication and programming interface.
– Version with CANopen bus interface (DSP 402).

1. Control inputs

A	B	
0	0	Output stage enabled
0	1	Direction of rotation: counter-clockwise
1	0	Direction of rotation: clockwise
1	1	Brake function*

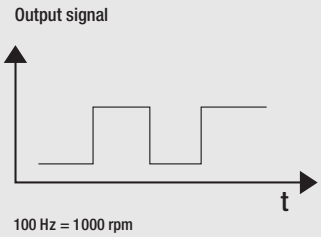
low (0) 0 to 0.8 V
high (1) 2.4 to 30 V

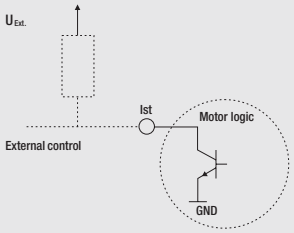
*Brake function:
At motor standstill (0 rpm) the position can be held continuously with nominal torque or short-term with starting torque (I^2t function).



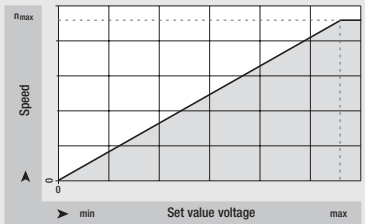
2. Actual speed value output

Version:
Open collector
$U_{ext.\,max}$ = < 36 V
U_{CESAT} = 0.4 V
I_{CMAX} = < 10 mA

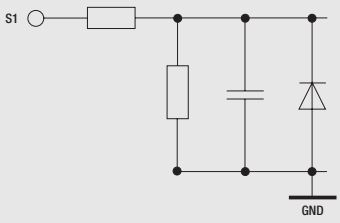




3. Set value input



Speed setting for closed loop speed control via set value voltage (interface 0…10 V DC)



For detailed information please refer to the corresponding specification data sheets. The instructions and safety notes in the operating manual must be kept at all times.