Data Sheet 10/68-8.27-EN Rev. A

EBN853 (Contrac)
Power Electronic Unit

For continuous control of Contrac actuators RHD(E) ... and RSD(E) ...

Microprocessor-controlled power electronic unit with integrated frequency converter

Voltage supply 115 V AC or 230 V AC

Conventional signal interface (0 / 4 ... 20 mA / 24 V)

Digital communication via RS232 and HART

PROFIBUS DP

Additional functions such as process controller, maintenance computer, programmable characteristics

Field-mount housing in high protection class IP 66

Torque and speed variation

Continuous positioning

Simple installation and commissioning

Simple configuration and parameter setting via graphical user interface

High response sensitivity

Reliable for short positioning times

Contents

1 Concept

Compact actuator for the operation of final control elements with preferably 90° rotary movement such as flaps, cocks, etc.

The torque is transferred via a lever / linkage bar assembly or the actuator is directly coupled to the cock flange.

A special power electronic unit controls the actuator. The electronic unit serves as the interface between actuator and control system.

During continuous positioning the power electronic unit varies the motor torque steplessly until the actuator force and the restoring process forces are balanced. High response sensitivity and high positioning accuracy with short positioning time ensure an excellent control quality and a long actuator life.

Note
The ANSI information appears in parentheses after the SI-information.

2 Technical data

2.1 General information

	Power Electronic Unit EBN853 (Contrac)
Protection Class	IP 66
Humidity	≤ 95% average; condensation not permitted
Ambient temperature	-25 … 55 °C (-15 … 130 °F)
Mounting position	at vertical support, cable gland at the left side
Coating	2-layer component epoxy (RAL 9005, black)
Cable between actuator and electronic unit	optional 5 m (16 ft), 10 m (32 ft) or 20 m (65 ft) with plug for connection to the actuator; max. cable length between actuator and electronic unit: 100 m (328 ft). No plug connection for explosion-proof actuators (RSDE … / RHDE …). Optional, loose cable set supply acc. to length requirements
Weight; approx.	11 kg (24 lbs)

2.2 Supply

Supply voltage (standard actuators)	115 V AC (94 … 130 V) or 230 V AC (190 … 260 V); 47.5 … 63 Hz; 1Ph			
Supply voltage (Ex actuators)	115 V AC (94 … 127 V) or 230 V AC (190 … 253 V); 47.5 … 63 Hz; 1Ph			
Current at electronic unit [A] (115 V AC / 230 V AC)		$I_{max.}$ at 115V	$I_{max.}$ at 230V	
	RHD(E)250-10	1,8 A	0.9 A	$I_{pos.}$ (115V + 230 V) approx. 40 … 50% of $I_{max.}$
	RHD(E)500-10	2,2 A	1,1 A	
	RHD(E)800-10	5,0 A	2,5 A	
	RHD(E)1250-12	5,0 A	2,5 A	
	RHD(E)2500-25	5,0 A	2,5 A	
	RHD(E)4000-40	5,8 A	2,7 A	
	RHD(E)8000-80	5,0 A	2,5 A	
	RSD(E)10-5.0	2,2 A	1,1 A	
	RSD(E)10-10,0	3,6 A	1,8 A	
	RSD(E)20-5.0	3,6 A	1,8 A	
	RSD(E)20-7,5	4,8 A	2,4 A	
	RSD(E)50-3,0	5,0 A	2,5 A	
	RSD100-1.5	5,0 A	2,5 A	
	RSD200-0,7	5,0 A	2,5 A	
External fuse	16 A; time-lag			

3 Communication

3.1 Conventional communication

Analog input	0 / 4 … 20 mA	
Analog output	0 / 4 … 20 mA, galvanically isolated	
3 digital inputs, BE 1 … BE 3 (DI 1 … DI 3)	Digital 0: -3 … 5 V or open, galvanically isolated Digital 1: 12 … 35 V, galvanically isolated	
3 digital outputs, BA 1... BA 3 (DO 1 … DO 3)	Potential free relay contact, max. 60 V, 150 mA	
Digital communication	RS 232 for commissioning and service, with optional FSK / HART® or PROFIBUS DP	
Default settings	Behavior in 0 / 100% end position:	Hold with rated / torque
	setpoint function:	linear, set point = position value
	setpoint input:	4 … 20 mA
	function selection:	positioner, parameter: setpoint
	actual value:	4 … 20 mA
	digital input:	BE 1 (DI 1) M/A selection; BE 2 / BE 3 (DI 2 / DI 3) manual intervention +/-
	digital output:	BA 1 (DO 1) ready for operation; BA 2/3 (DO 2/3) end position signal 0 / 100% not activated for standard actuators
	positioning time-out	always activated for actuators in explosion proof design
Voltage output U_V	24 V, 15 mA, galvanically isolated ; e.g., for scanning external contacts	
Transmitter (optional)	Supply for 2-wire transmitter with activated process controller in Contrac	
Individual settings	See data sheet 10/68-2.40 or upon request	

3.2 PROFIBUS DP communication

PNO ID no.	0x9655 Actuators with DP/V0 communication (cyclical data traffic) 0x09EC Actuators with DP/V1 communication (cyclical and acyclical data traffic)
Communications protocol	Profibus PA profile V3.0 Class B acc. to IEC 50170 / EN 50170 (DIN 19245)
Bus cable	Twisted, shielded copper wire acc. to IEC 50170 / EN 50170
Interface	EIA-485 (RS485) acc. to IEC 50170 / EN 50170
Permissible baud rates	- 93.75 kbit/s - 187,5 kbit/s - 500 kbit/s - 1500 kbit/s Automatic baud rate detection
Bus address	0 ... 126, default address 126 Set Slave Address service is supported
Bus termination	Connectable active bus termination. Voltage supply from power electronic unit
Block types	1 AO Functional block 1 Transducer block 1 Physical block
Fail Save	Failsafe function is supported. Configurable function for downtime of bus communication - Lock in last position - Drive to safety position - Rules with last effective setpoint Adjustable time delay.
Modules for cyclical communication	8 standards-compliant modules and 2 manufacturer-specific modules are available.* SP (Short) SP (Long) RCAS_IN+RCAS_OUT SP+READBACK+POS_D SP+CHECKBACK SP+READBACK+POS_D+CHECKBACK RCAS_IN+RCAS_OUT+CHECKBACK SP+RCAS_IN+READBACK+RCAS_OUT+POS_D+ CHECKBACK STANDARD SP+RB+MESSEING
Acyclical communication	Full parametrization and configurability via Master Class 2 and DTM
Default settings	Behavior in 0/100% end position: Hold with rated torque / force Setpoint function: Linear, setpoint = position value Setpoint input: Digital Function selection: Positioner, parameter: setpoint Actual value: Digital
Digital outputs, BA 1 and BA 2 (DO 1 and DO 2)	In addition to the Profibus communication, there are 2 digital outputs. Potential free relay contact, max. 60 V, 150 mA Default settings: BA 1 (DO1) end position signal 0% BA 2 (DO 2) ready for operation 100%
Individual settings	See data sheet 10/68-2.40 or upon request

*Full description of communication modules, see parametrization and configuration instructions 45/68-10 DE

3.3 24-pole plug on the actuator

Max. cable gauge		
mains; motor	fixed:	6 mm² (10 AWG)
	flexible	4 mm² (12 AWG)
signal	fixed:	4 mm² (12 AWG)
	flexible:	2,5 mm² (14 AWG)

3.4 Tapped holes for cable glands

Tap holes for cable glands			
	metric	optional adapters for*	
mains	M20 x 1.5 (1 x)	PG 16 (1 x)	NPT ½" (1 x)
signal	M20 x 1.5 (3 x)	PG 16 (3 x)	NPT ½" (3 x)
motor	M25 x 1.5 (1 x)	PG 21 (1 x)	NPT ¼" (1 x)

* adapter for PG or NPT thread must be ordered separately

4 Electrical connection

4.1 Analog / digital

Note
The electrical connection is provided by a plug on the actuator and the terminals on the electronic unit.

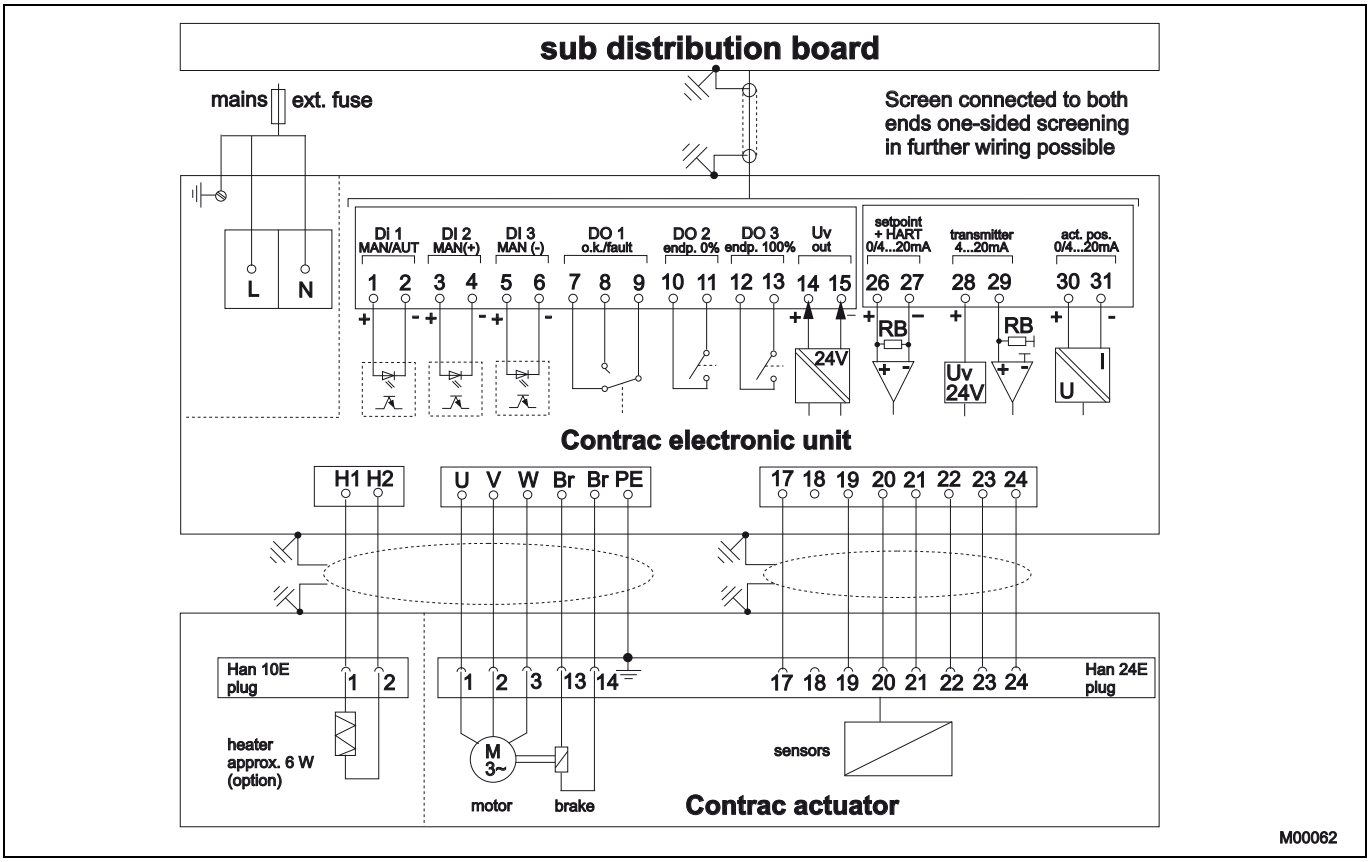

Fig. 1: Electrical connection: Standard analog / digital

4.2 PROFIBUS DP

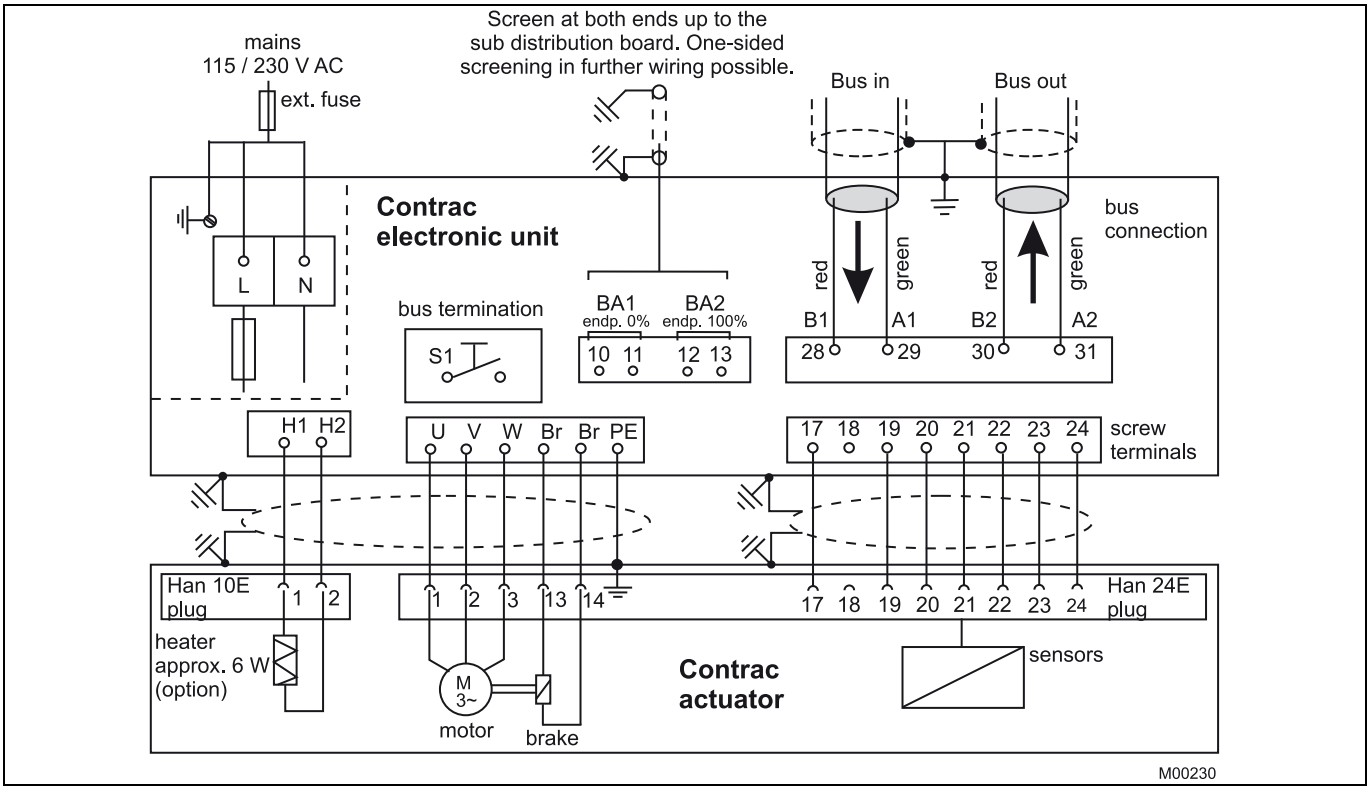

Fig. 2 Electrical connection: PROFIBUS DP option

4.3 Ex actuator analog / digital

Note
The electrical connection is provided by terminals on the actuator and on the electronic unit.

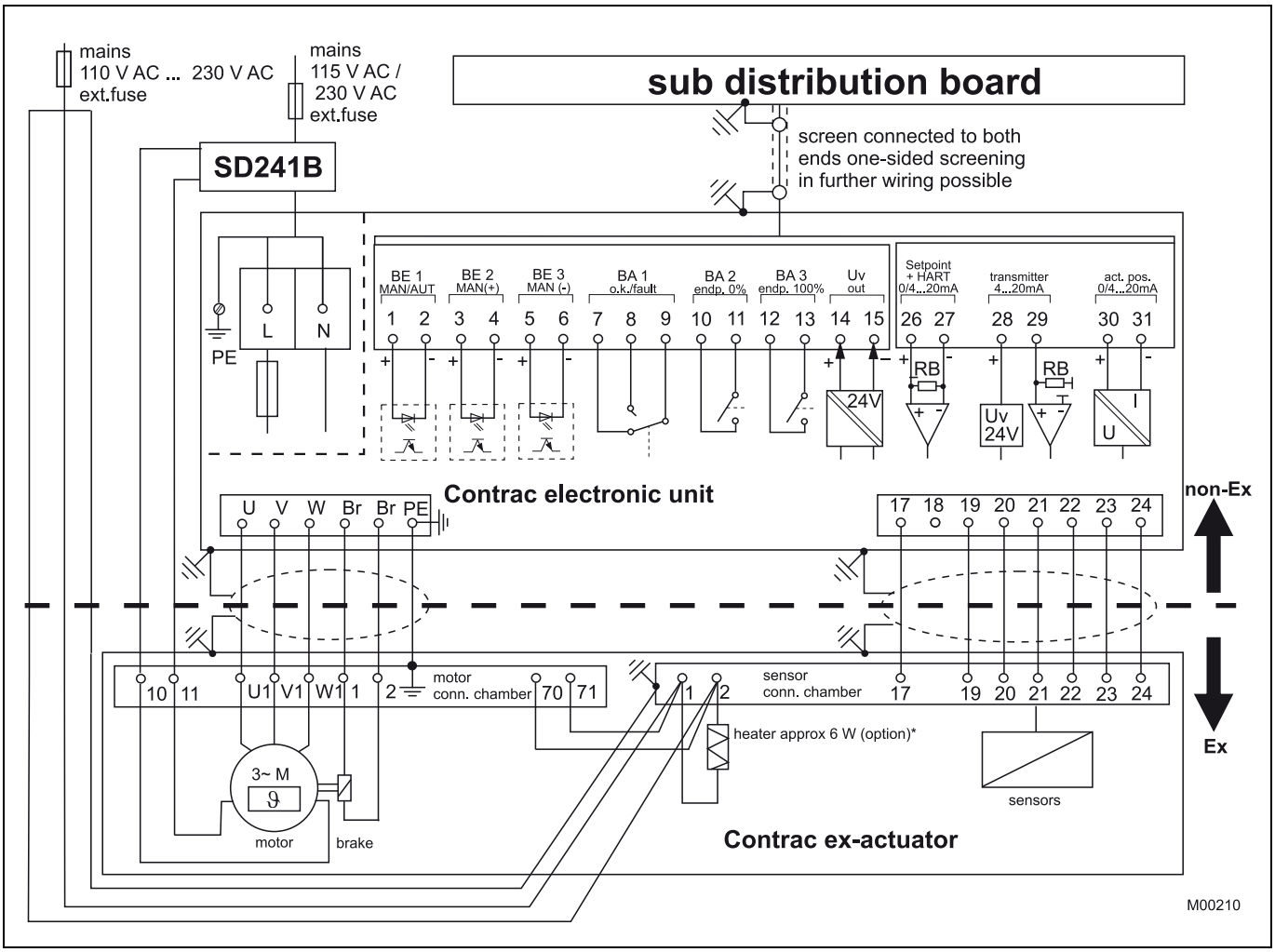

Fig. 3 Electrical connection: Ex actuator analog / digital

Note
* For separate heat supply, protect the heater with 2 … max. 6 A medium time-lag fuses (e.g., Neozed D01CE14).

Installation information on the cable harness for actuators in Ex design
The electrical connection between the Contrac electronic unit and the Contrac actuator can be established using the cable set (order code 695). The cable harness is not part of the Ex prototype test certificate and must therefore be tested for safety-relevant functionality within the complete installation by the installer or operator.

If the specified cable harness does not meet all safety-relevant requirements, the proper installation material must be used.

For the specified motor connecting cable, the screen must be connected at both ends and grounded.

4.4 Ex actuators; PROFIBUS DP

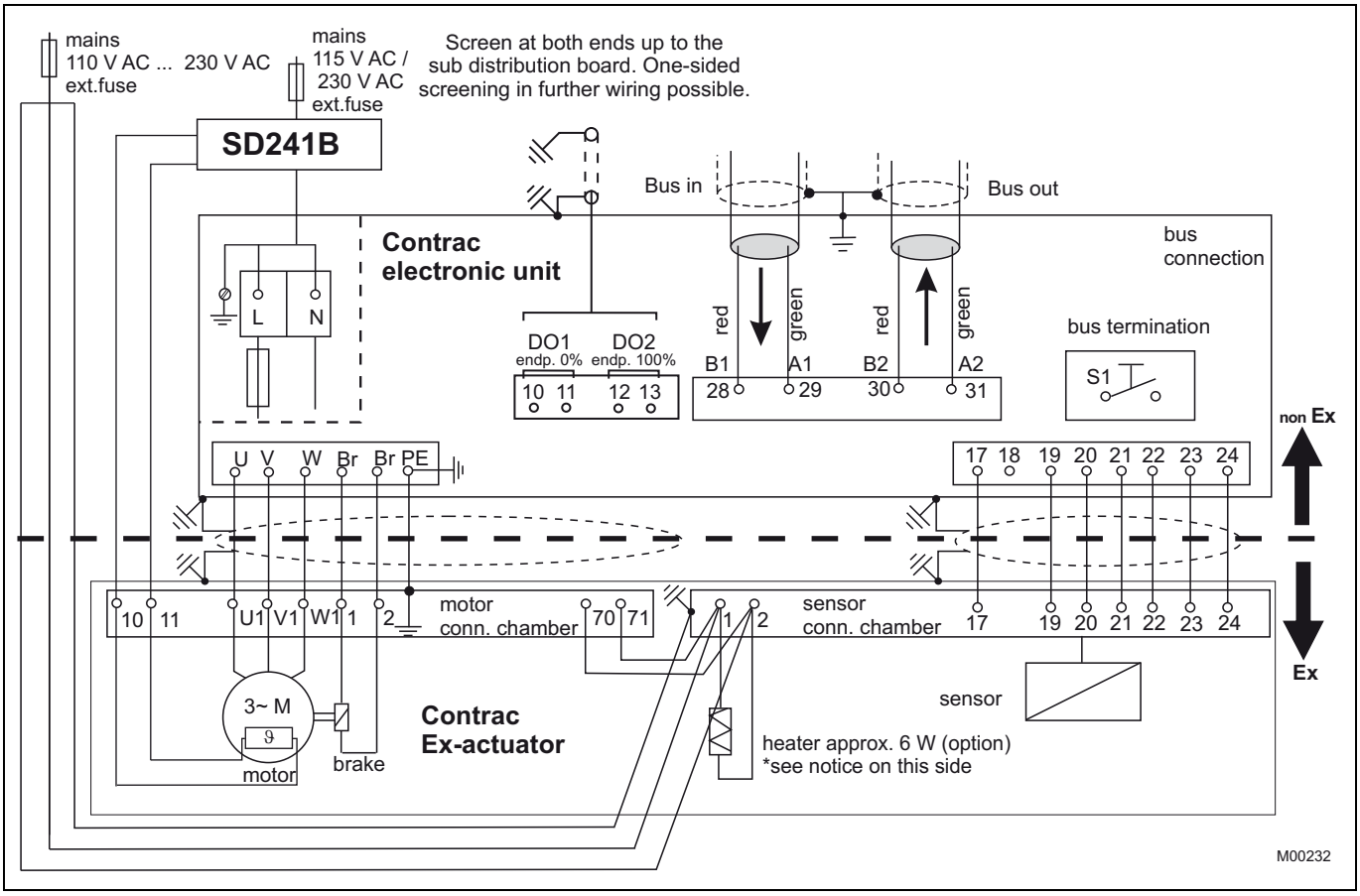

Fig. 4 Electrical connection: PROFIBUS DP option

Note

* For separate heat supply, protect the heater with 2 … max. 6 A medium time-lag fuses (e.g., Neozed D01CE14).

Installation information on the cable harness for actuators in Ex design

The electrical connection between the Contrac electronic unit and the Contrac actuator can be established using the cable set (order code 695). The cable harness is not part of the Ex prototype test certificate and must therefore be tested for safety-relevant functionality within the complete installation by the installer or operator.

If the specified cable harness does not meet all safety-relevant requirements, the proper installation material must be used.

For the specified motor connecting cable, the screen must be connected at both ends and grounded.

5 Dimensions

5.1 Power Electronic Unit EBN853 (Contrac)

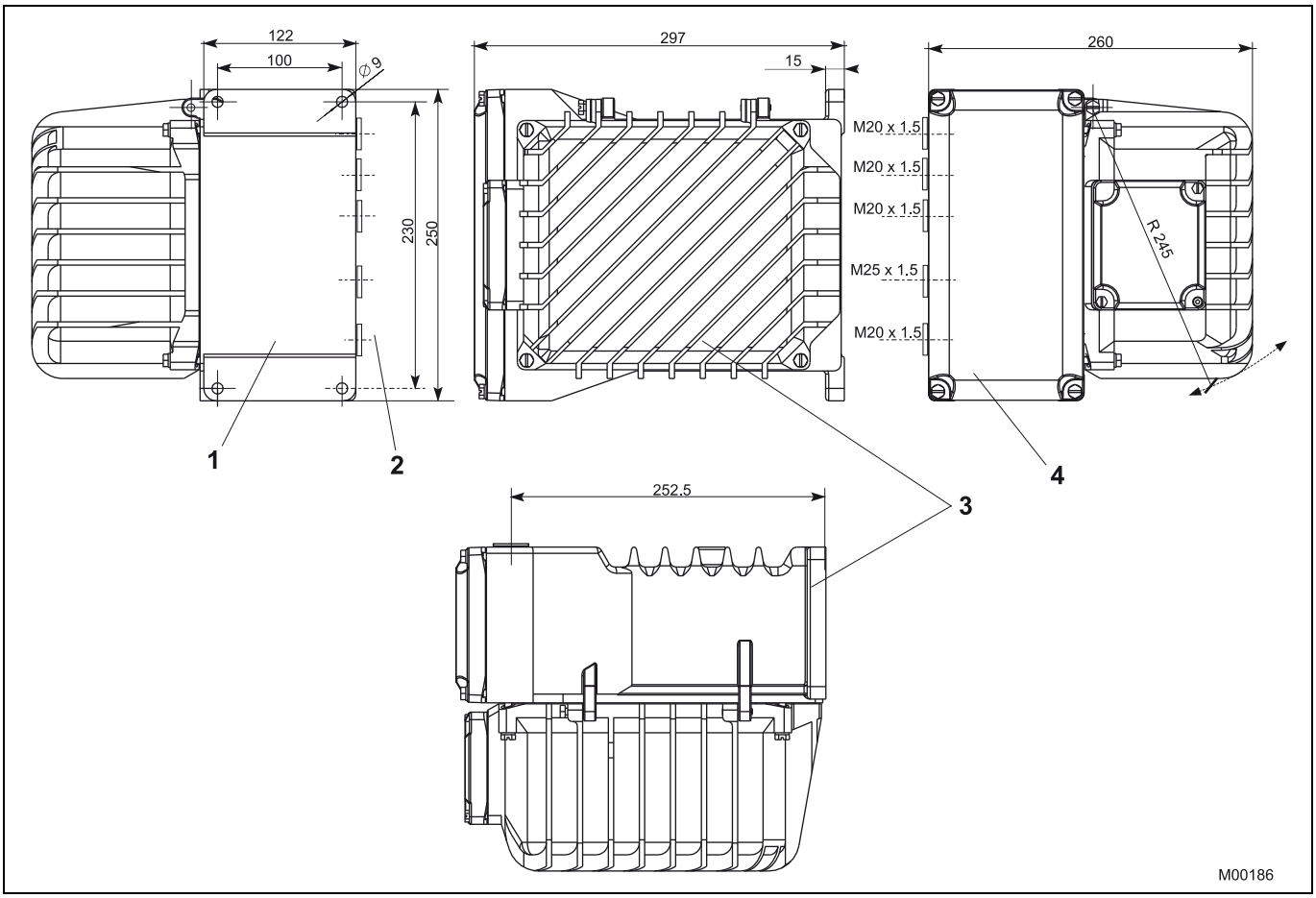

Fig. 5: Dimensions in mm

1 Rear view
2 at min. allow 100 mm separation for cable gland and cable radius
3 Side view
4 Front view

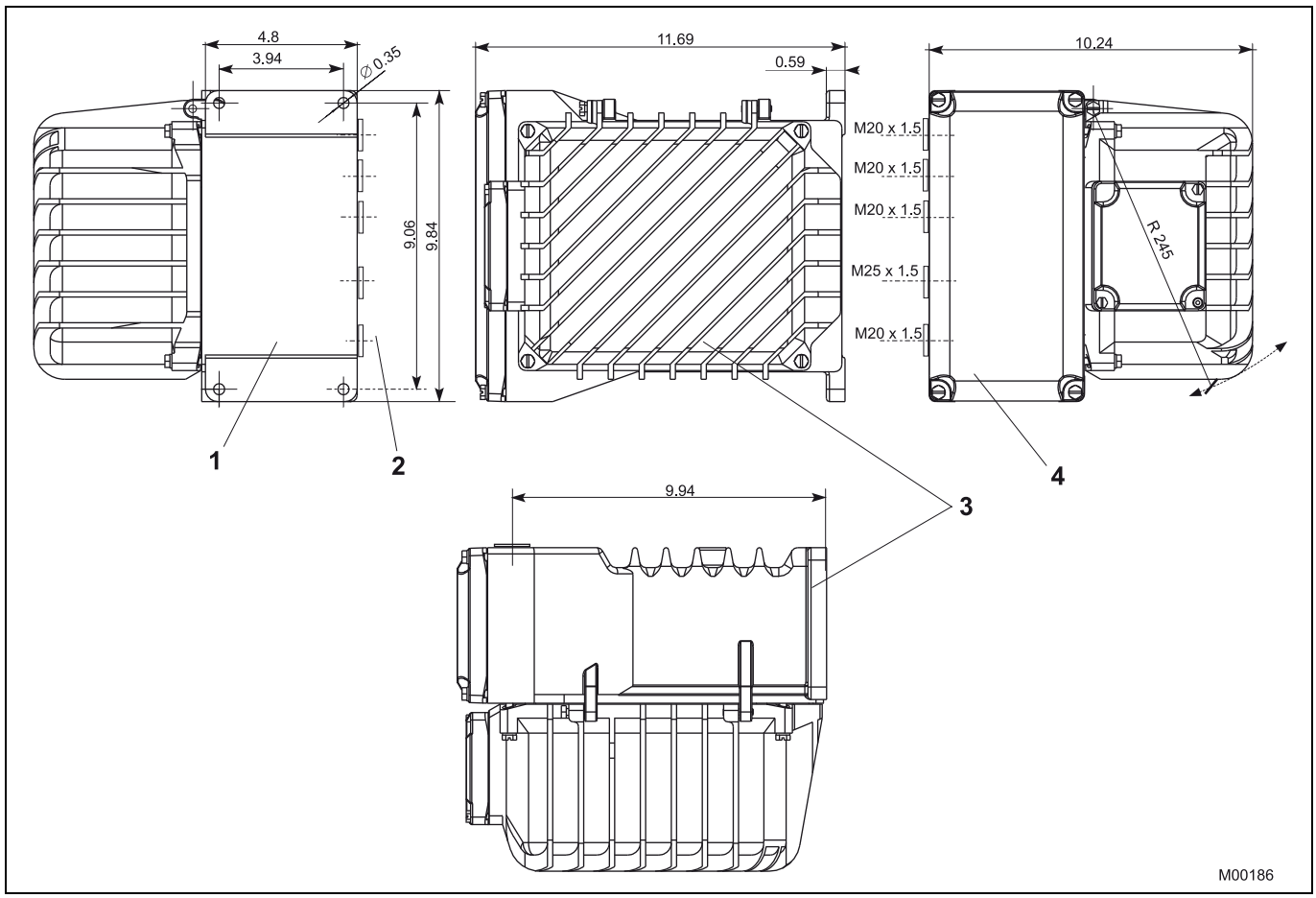

Fig. 6: Dimensions in inches

1 Rear view
2 at min. allow 3.94 inch separation for cable gland and cable radius
3 Side view
4 Front view

6 Ordering information

6.1 Power Electronic Unit EBN853 (Contrac)

Electronic Unit					Variant digit No.	1 - 7	8	9	10	11	Code			
EBN853					Catalog No.	**V68853-**								
Suitable for														
Linear Actuator	Force		Speed		Stroke									
RSD10-5,0/100	10 kN	(2250 lbs)	5.0 mm/s	(5.0 s/in)	100 mm	(4.0 in)	2	0	5	0				
RSD10-5,0/300	10 kN	(2250 lbs)	5.0 mm/s	(5.0 s/in)	300 mm	(11.8 in)	9	1	5	0				
RSD10-10,0/100	10 kN	(2250 lbs)	10.0 mm/s	(2.5 s/in)	100 mm	(4.0 in)	2	0	5	1				
RSD10-10,0/300	10 kN	(2250 lbs)	10.0 mm/s	(2.5 s/in)	300 mm	(11.8 in)	9	1	5	1				
RSD20-5,0/100	20 kN	(4500 lbs)	5.0 mm/s	(5.0 s/in)	100 mm	(4.0 in)	2	0	5	2				
RSD20-5,0/300	20 kN	(4500 lbs)	5.0 mm/s	(5.0 s/in)	300 mm	(11.8 in)	9	1	5	2				
RSD20-7,5/100	20 kN	(4500 lbs)	7.5 mm/s	(3.4 s/in)	100 mm	(4.0 in)	2	0	5	3				
RSD20-7,5/300	20 kN	(4500 lbs)	7.5 mm/s	(3.4 s/in)	300 mm	(11.8 in)	9	1	5	3				
RSD50-3,0/120	50 kN	(11240 lbs)	5.0 mm/s	(5.0 s/in)	120 mm	(4.7 in)	3	0	5	4				
RSD50-3,0/300	50 kN	(11240 lbs)	5.0 mm/s	(5.0 s/in)	300 mm	(11.8 in)	9	1	5	4				
RSD100-1,5/150	100 kN	(22500 lbs)	1.5 mm/s	(17.0 s/in)	150 mm	(5.9 in)	2	1	5	5				
RSD100-1,5/300	100 kN	(22500 lbs)	1.5 mm/s	(17.0 s/in)	300 mm	(11.8 in)	9	1	5	5				
RSD200-0,7/180	200 kN	(45000 lbs)	0.7 mm/s	(36.3 s/in)	180 mm	(7.08 in)	5	4	5	6				
RSD200-0,7/300	200 kN	(45000 lbs)	0.7 mm/s	(36.3 s/in)	300 mm	(11.8 in)	9	1	5	6				
Part-Turn Actuator	Torque		Speed											
RHD250-10	250 Nm	(200 ft-lbs)	9.0 °/s				0	1	0	3				
RHD500-10	500 Nm	(400 ft-lbs)	9.0 °/s				0	1	0	4				
RHD800-10	800 Nm	(600 ft-lbs)	9.0 °/s				0	1	0	5				
RHD1250-12	1250 Nm	(1000 ft-lbs)	7.5 °/s				0	1	0	6				
RHD2500-25	2500 Nm	(1900 ft-lbs)	3.5 °/s				0	1	0	7				
RHD4000-40	4000 Nm	(3000 ft-lbs)	2.25 °/s				0	1	0	8				
RHD8000-80	8000 Nm	(6000 ft-lbs)	1.25 °/s				0	1	0	9				

Special features of Electronic Unit Select at least one feature per group					
Supply voltage	230 V AC 1 Ph			380	
	115 V AC 1 Ph			381	
Frequency	50 Hz			382	
	60 Hz			383	
Digital communication	RS 232			384	
	RS 232 + HART			385	
	PROFIBUS DP	(cyclic communication)		386	
	PROFIBUS DPV1	(cyclic and acyclic communication)		387	
Electrical connection to actuator	without cable (plug at actuator)			335	
	with 5 m (16 ft) cable end and 24-pole plug			690	
	with 10 m (32 ft) cable end and 24-pole plug			691	
	with 20 m (65 ft) cable end and 24-pole plug			692	
Ambient temperature range of actuator	-30 ... 50 °C (-20 .... 130 °F)			341	
	-10 ... 65 °C (15 ... 150 °F)			344	
	-1 ... 85 °C (30 ... 185 °F)	(only f. RHD250/500/800 a.RSD10/20)		349	
Settings of electronic unit	Standard settings	(see techn. data)		390	
	Customer specific settings	(see data sheet 10/68-2.40 EN)		391	

Additional ordering information					
			Code		
Electrical connection thread	Set NPT adapter (joint metric / NPT thread)		680		
	Set PG adapter (joint metric / PG thread)		681		
Anti-condensation heater in actuator "ON"			359		
Identification on data label	(alphanumeric, max. 32 characters)		295		
Data label with US units			253		
F. No. of associated actuator on data label of electronic unit			297		
Factory certificate 2.1 acc. to EN 10204			291		
Certificate B acc. to EN 10204			292		
Operating instruction	(specify total quantity required, 1 copy without extra charge)				
German	(no specification for 1 copy)		Z1D		
English	(always state Code-No.)		Z1E		

Note: Delivery time for max. 2 pcs. For 3 pcs. or more delivery time on request.

Electronic Unit						Variant digit No.	1 - 7	8	9	10	11	Code			
EBN853						Catalog No.	**V68853-**								
Suitable for															
Linear Actuator	Force		Speed		Stroke										
RSDE10-5,0/100	10 kN	(2250 lbs)	5.0 mm/s	(5.0 s/in)	100 mm	(4.0 in)		2	0	7	6				
RSDE10-5,0/300	10 kN	(2250 lbs)	5.0 mm/s	(5.0 s/in)	300 mm	(11.8 in)		9	1	7	6				
RSDE10-10,0/100	10 kN	(2250 lbs)	10.0 mm/s	(2.5 s/in)	100 mm	(4.0 in)		2	0	7	7				
RSDE10-10,0/300	10 kN	(2250 lbs)	10.0 mm/s	(2.5 s/in)	300 mm	(11.8 in)		9	1	7	7				
RSDE20-5,0/100	20 kN	(4500 lbs)	5.0 mm/s	(5.0 s/in)	100 mm	(4.0 in)		2	0	7	8				
RSDE20-5,0/300	20 kN	(4500 lbs)	5.0 mm/s	(5.0 s/in)	300 mm	(11.8 in)		9	1	7	8				
RSDE20-7,5/100	20 kN	(4500 lbs)	7.5 mm/s	(3.4 s/in)	100 mm	(4.0 in)		2	0	7	9				
RSDE20-7,5/300	20 kN	(4500 lbs)	7.5 mm/s	(3.4 s/in)	300 mm	(11.8 in)		9	1	7	9				
RSDE50-3,0/120	50 kN	(11240 lbs)	5.0 mm/s	(5.0 s/in)	120 mm	(4.7 in)		3	0	8	0				
RSDE50-3,0/300	50 kN	(11240 lbs)	5.0 mm/s	(5.0 s/in)	300 mm	(11.8 in)		9	1	8	0				
RSDE100-1,5/150	100 kN	(22500 lbs)	1.5 mm/s	(17.0 s/in)	150 mm	(5.9 in)		2	1	8	5				
RSDE100-1,5/300	100 kN	(22500 lbs)	1.5 mm/s	(17.0 s/in)	300 mm	(11.8 in)		9	1	8	5				
Part-Turn Actuator	Torque		Speed												
RHDE250-10	250 Nm	(185 ft-lbs)	9.0 °/s					0	1	1	0				
RHDE500-10	500 Nm	(370 ft-lbs)	9.0 °/s					0	1	1	9				
RHDE800-10	800 Nm	(600 ft-lbs)	9.0 °/s					0	1	2	0				
RHDE1250-12	1250 Nm	(925 ft-lbs)	7.5 °/s					0	1	2	8				
RHDE2500-25	2500 Nm	(1850 ft-lbs)	3.5 °/s					0	1	2	9				
RHDE4000-40	4000 Nm	(2950 ft-lbs)	2.25 °/s					0	1	5	7				
RHDE8000-80	8000 Nm	(5900 ft-lbs)	1.25 °/s					0	1	5	8				
Special features of Electronic Unit															
Select at least one feature per group															
Supply voltage	230 V AC 1 Ph											380			
	115 V AC 1 Ph											381			
Frequency	50 Hz											382			
	60 Hz											383			
Digital communication	RS 232											384			
	RS 232 + HART											385			
	PROFIBUS DP		(cyclic communication)									386			
	PROFIBUS DPV1		(cyclic and acyclic communication)									387			
Electrical connection to actuator	without cable											335			
	with cable for motor and signals						price per m					695			
	..... m cable length (max. 100 m; 328 ft)														
Ambient temperature range	-25 ... 60 °C (-13 ... 140 °F)		(only for part turn actuators Ex)									346			
of actuator	-30 ... 40 °C (-22 ... 104 °F)		(only for part turn actuators Ex)									347			
	-20 ... 60 °C (-4 ... 140 °F)		(only for linear actuators Ex)									348			
Settings of electronic unit	Standard settings		(see techn. data)									390			
	Customer specific settings		(see data sheet 10/68-2.40 EN)									391			

Additional ordering information

		Code			
Electrical connection thread	Set NPT adapter (joint metric / NPT thread)	680			
	Set PG adapter (joint metric / PG thread)	681			
Anti-condensation heater in actuator "ON"		359			
Identification on data label	(alphanumeric, max. 32 characters)	295			
Data label with US units		253			
F. No. of associated actuator on data label of electronic unit		297			
Factory certificate 2.1 acc. to EN 10204		291			
Certificate B acc. to EN 10204		292			
Operating instruction	(specify total quantity required, 1 copy without extra charge)				
German	(no specification for 1 copy)	Z1D			
English	(always state Code-No.)	Z1E			

Note: Delivery time for max. 2 pcs. For 3 pcs. or more delivery time on request.

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