

Explosion Proof Electrical Actuators (Contrac)

System description



—
RSDE50
RHDE1250
SD241-B
EBN861
EBN853

Introduction

Electric actuators for positioning valve flaps and valves in the process control loop.

Combining durability and precision positioning.

Suited for continuous positioning and three-step control.

Additional Information

Additional documentation on continuous control actuators is available for download free of charge at www.abb.com/actuators.

Alternatively simply scan this code:



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1 Design and function

Principle of operation

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

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

components

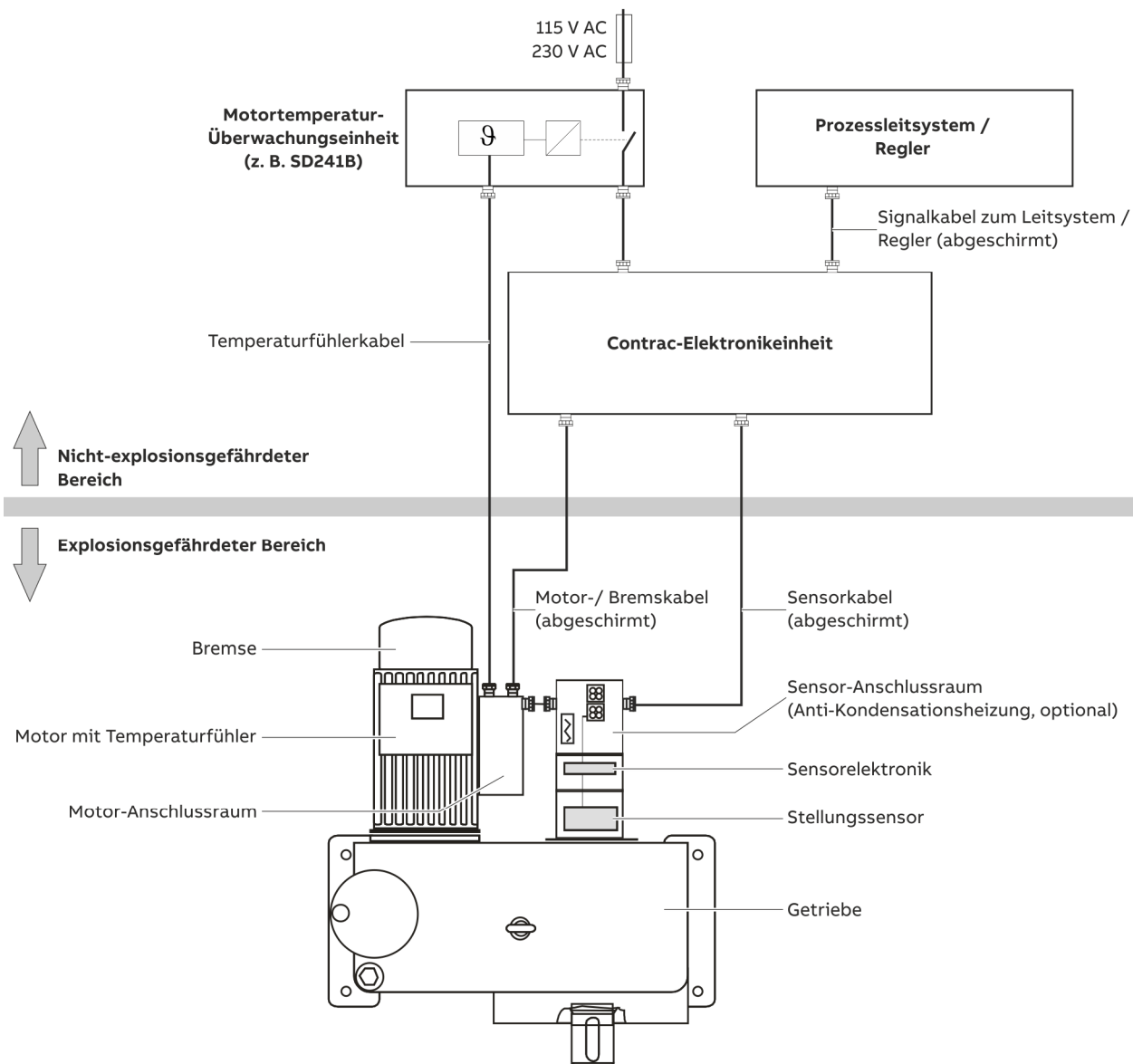


Figure 1: Setup of the Contrac components when using in potentially explosive atmospheres (example)

... 1 Design and function

... components

Pos.	Part-turn actuator	Nominal torque (configurable)	Nominal speed (configurable)	Rated actuator travel (configurable)
①	RHDE250-10	250 Nm	10s/90°	90°
	RHDE500-10	500 Nm	10s/90°	90°
	RHDE800-10	800 Nm	10s/90°	
	RHDE1250-12	1250 Nm	12s/90°	90°
	RHDE2500-10	2500 Nm	10s/90°	
	RHDE2500-25	2500 Nm	25s/90°	
	RHDE4000-10	4000 Nm	10s/90°	90°
	RHDE4000-40		40s/90°	
	RHDE8000-15	8000 Nm	15s/90°	90°
	RHDE8000-80		80s/90°	
	RHDE16000-30	16000 Nm	30s/90°	90°
	Linear actuator	Rated force (configurable)	Nominal speed (configurable)	Maximum actuator travel (configurable)
	RSDE10-5	10 kN	5,0 mm/s	100 / 300 mm
	RSDE10-10	10 kN	10,0 mm/s	
	RSDE20-5	20 kN	5,0 mm/s	
	RSDE20-7,5	20 kN	7,5 mm/s	
	RSDE50-3	50 kN	3,0 mm/s	120 / 300 mm
	RSDE50-10		10,0 mm/s	
Pos.	Electronic unit	Assembly		
②	EBN853 / EBN861	For field mounting (IP 66)		
	EBS852 / EBS862	For rack installation (IP 20)		
Pos.	Motor temperature monitoring	Assembly		
③		For field or rack mounting (IP 54)		

Table 1: Available components

Type code

R	x	D	E	xxx	-	xx	Drives
							Stroke time in s/90° or operating speed in mm/s
							Nominal torque in Nm or rated force in kN
							Explosion-proof design
							Series
							H = rotary actuator, S = linear actuator
							R = Actuators for modulating duty
E	B	x	8	xx			Electronic units
							52 and 53 medium performance range, 61 and 62 high performance range
							Series
							N = for field mounting IP 66, S = for rack mounting IP 20
							Performance class
							Electronic unit
SD241-B							Motor temperature monitoring unit
							Type designation

2 Components



RHDE250



RHDE500/
RHDE800



RHDE1250/
RHDE2500

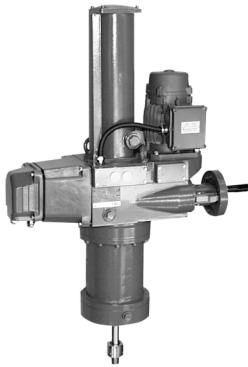


RHDE4000



RHDE8000/
RHDE16000

Figure 2: Rotary actuators



RSDE10/
RSDE20



RSDE50

Figure 3: Linear actuators



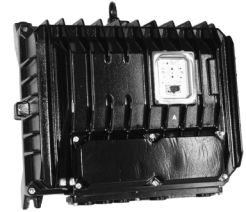
EBN853



EBN861



EBS852



EBS862

Figure 4: Electronic units



SD241-B

Figure 5: Motor temperature monitoring unit

3 Typical applications



① Valve flap actuation

② Rotary plug valve actuation



③ Valve positioning



Figure 6: Typical applications for electric control actuators (examples)

4 Features

- Electric actuators for positioning valve flaps and valves in the process control loop.
- Minimum maintenance costs
- Combining durability and precision positioning
- Suited for continuous positioning and three-step control
- Stallproof without the need for position-dependent or torque-dependent switch-off
- Explosion protection in accordance with ATEX and Rostechnadzor / GOST
- Three-phase asynchronous motor, flameproof enclosure
- Connection spaces with increased safety
- Sturdy gear unit with highly efficient design
- Adjustable mechanical limit stops for defined operating range
- Handwheel for emergency operation
- Integrated position and temperature sensors
- Control via separate, processor-controlled electronic unit
- Actuators for complex control tasks
- High positioning accuracy
- Maximum reliability and service life thanks to:
 - Continuous positioning principle
 - Sturdy oil-lubricated gear unit; stallproof
 - Continuous duty with 100% ON time (S9 in accordance with IEC 60034-1 / EN 60034-1)
 - Reliable frequency converter electronics
 - Activation via conventional signals (with HART®) or fieldbus
 - Additional functions (e.g. adjustment, diagnostics, maintenance, process controller)

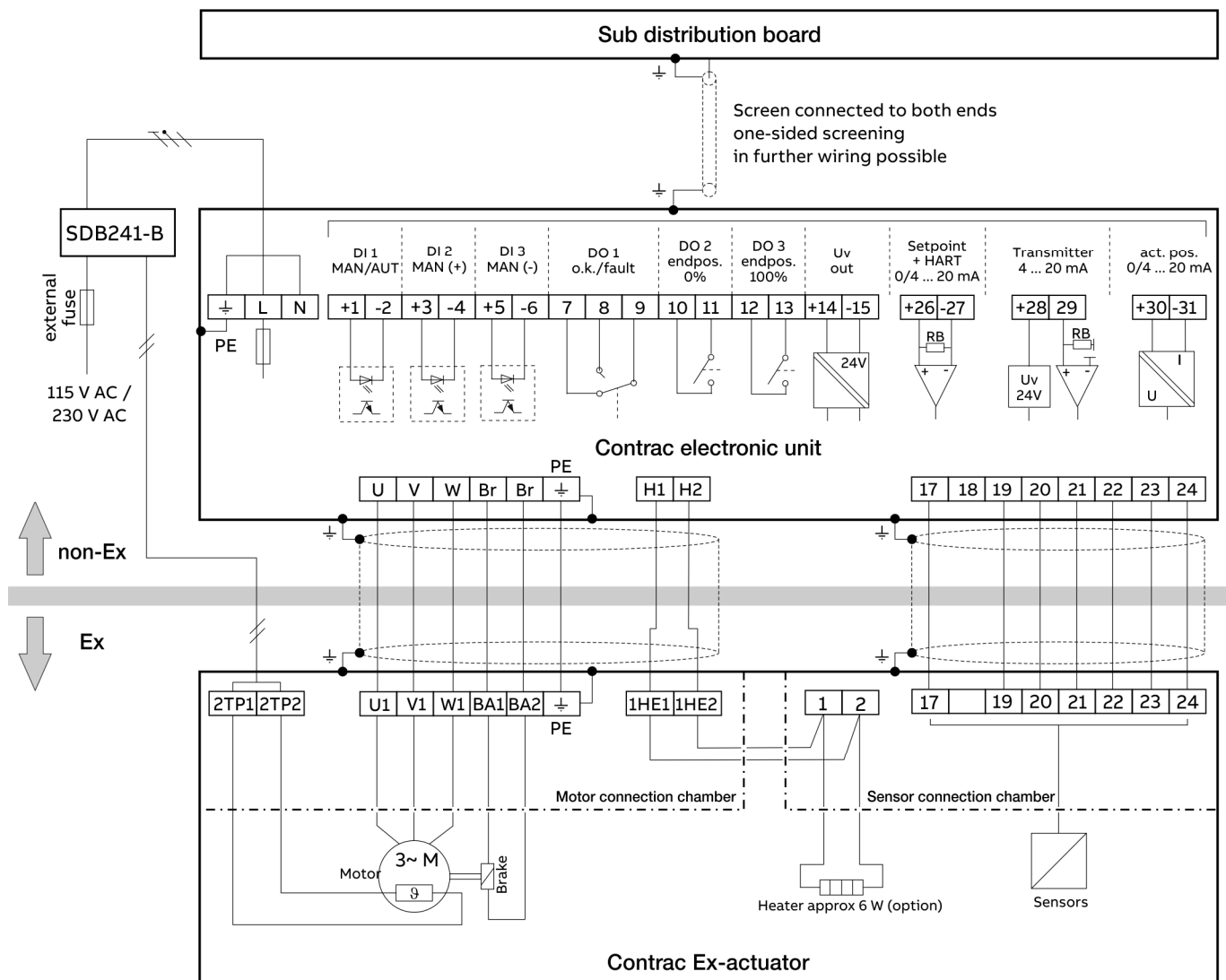
5 Electrical connections

Electronic Unit EBN853 (Contrac)

Analog / Digital

Note

The electrical connection is established via screw terminals on the control actuator and on the electronic unit.



DI = digital input

DO = digital output

Figure 7: Control via analog input 0/4 to 20 mA, HART® communication or digital inputs

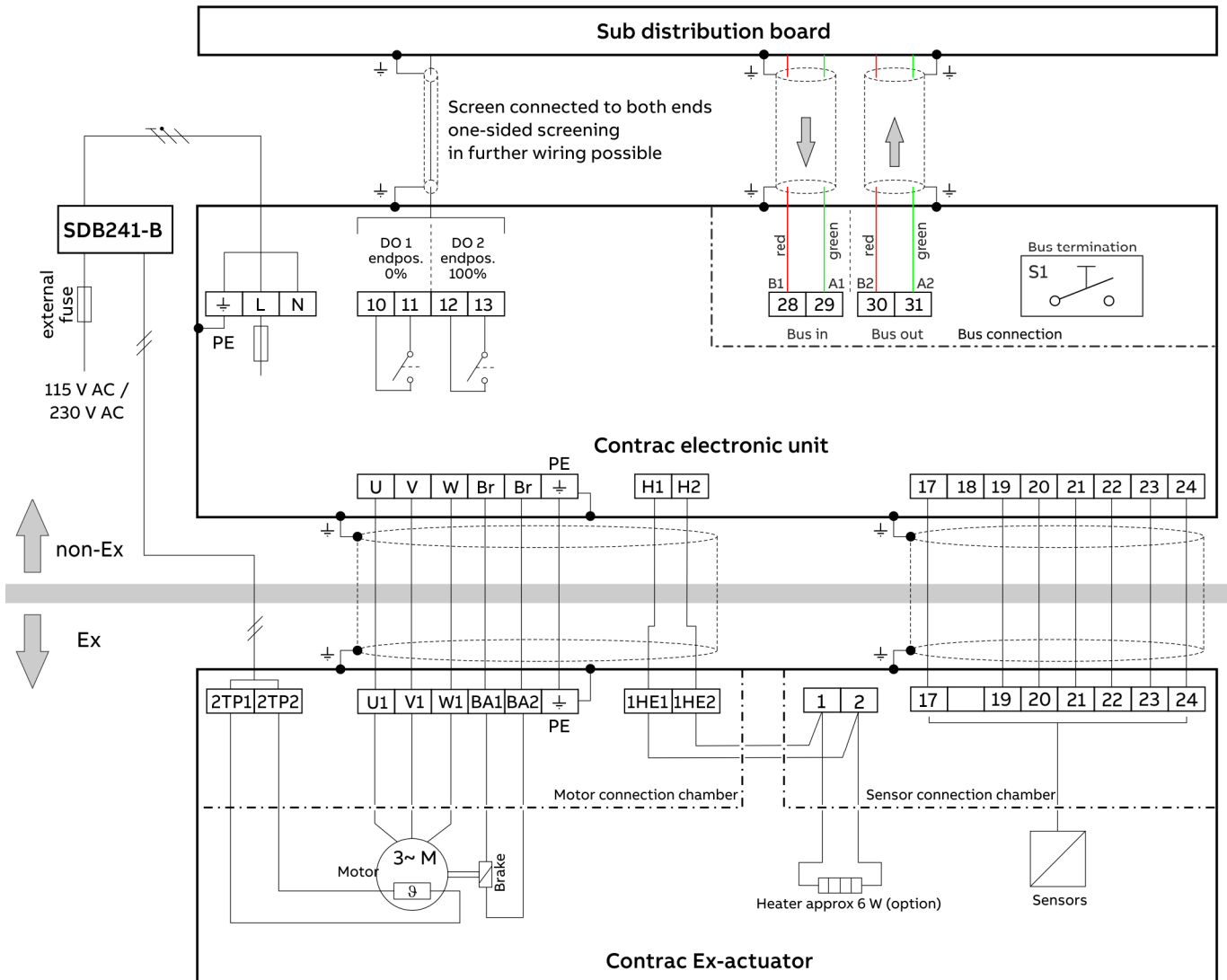
... 5 Electrical connections

... Electronic Unit EBN853 (Conrac)

PROFIBUS DP®

Note

The electrical connection is established via screw terminals on the control actuator and on the electronic unit.



DO = digital output

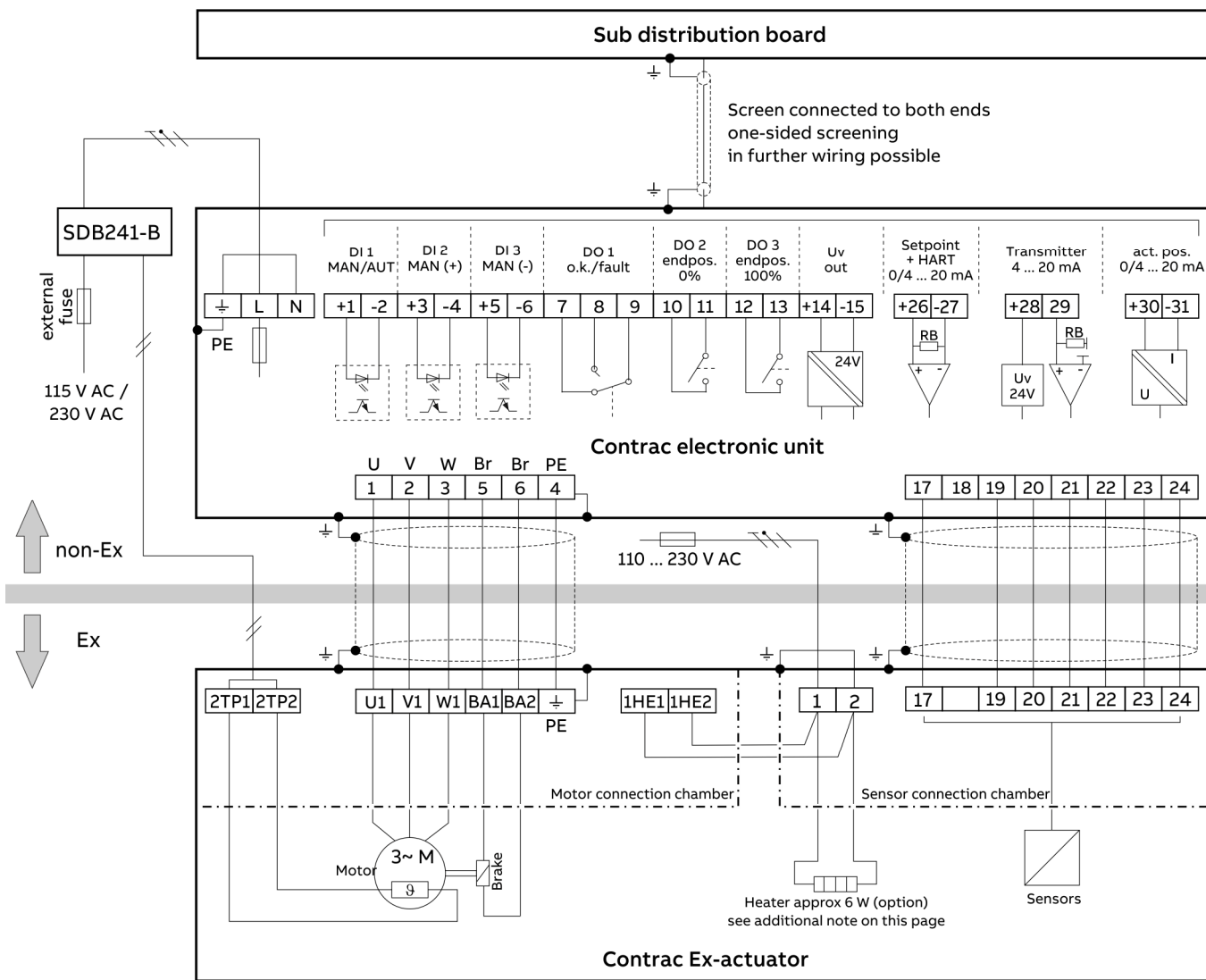
Figure 8: Control via fieldbus PROFIBUS DP®

Electronic unit EBS852, EBS862, EBN861 (Contrac)

Analog / Digital

Note

- The electrical connection is established via screw terminals on the control actuator and on the electronic unit.
- If you are using a separate heat supply, the heater must be protected with a 2 to 6 A medium time-lag fuse (e.g. NEOZED D01 E14).



BE = digital input
 BA = digital output

Figure 9: Control via analog input 0/4 to 20 mA, HART® communication or digital inputs

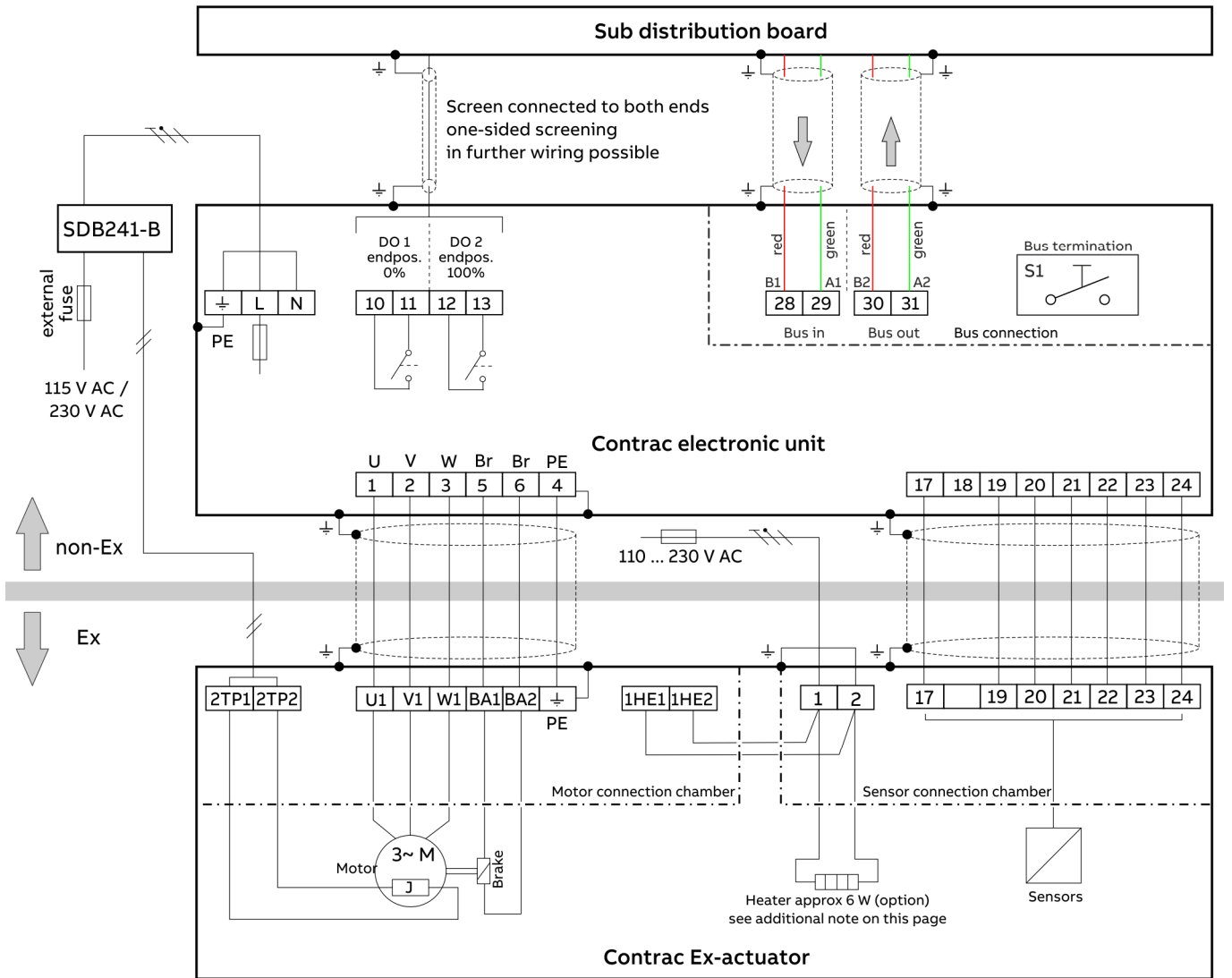
... 5 Electrical connections

... Electronic unit EBS852, EBS862, EBN861 (Contrac)

PROFIBUS DP®

Note

- The electrical connection is established via screw terminals on the control actuator and on the electronic unit.
- If you are using a separate heat supply, the heater must be protected with a 2 to 6 A medium time-lag fuse (e.g. NEOZED D01 E14).



BA = digital output

Figure 10: Control via fieldbus PROFIBUS DP®

6 Specification

Rotary actuators

RHDE250 to RHDE16000	
Nominal torque	250 to 16000 Nm (185 bis 11800 lbf-ft), adjustable to 0.5, 0.75 or 1 × nominal torque
Starting torque	1.2 × nominal torque (break-away torque in end positions for short time 2 × nominal torque)
Rated time for 90°; adjustable	10 to 900 s
Rated operating speed, adjustable	9.0 to 0.1°/s
Operating angle	Typically 90° (min. 35°; max. 140°), with lever and limit stops the mechanical limits in accordance with operating instruction should be complied with.
Weight	61.5 to 1030 kg (136 to 2270 lb)
Thermal motor monitoring	With motor temperature monitoring unit SD241-B or similarly certified tripping unit for thermistor temperature sensors
Motor	BD 80... .. BD112...
Sensors	Position transmitter and temperature sensor always available
Operating mode	S9; stallproof acc. to EN 60034-1
IP rating	IP 66
Explosion protection	ATEX
Humidity	≤ 95 % annual average; condensation not permitted
Ambient temperature	-25 to 60 °C (-13 to 140 °F) -30 to 40 °C (-22 to 104 °F) (reduced operating speed at rated load and below -10 °C (14 °F))
Transport and storage temperature	-30 to 60 °C (-22 to 140 °F)
Long-term storage temperature	-30 to 40 °C (-22 to 104 °F)
Mounting position	IMB 3, IMB 6, IMB 7, IMV 6; preferably IMB 3 in accordance with EN 60034-7
Coating	2-layer component epoxy (RAL 9005, black)
Anti-condensation heater	Motor winding: directly from electronic unit. Signal space: separate heating resistor; separate power supply or power feed from Confrac electronic unit
Electrical connection	Terminals in Ex e area; separately for motor and signals Connection cable for electronic unit – actuator available as an option (see ordering information for electronic unit)
Power supply for motor and sensors	Via Confrac electronic unit only

Table 2: Specification – Rotary actuator

... 6 Specification

Linear actuators

RSDE10 to RSDE50	
Rated force	10 to 50 kN (2200 to 11000 lbf), (adjustable to 0.5 / 0.75 or 1 × rated force)
Starting force	1.2 × rated force (break-away torque in end positions for short time 2 × rated force)
Rated operating speed, adjustable	0.1 to 10.0 mm/s (254 to 2.5 s/in)
Stroke	min.: 0 to 15 mm (0 to 0.59 in) / max. 0 to 100 mm (0 to 4 in) or min.: 0 to 50 mm (0 to 1.97 in) / max. 0 to 300 mm (0 to 11.8 in)
Weight	57 to 85 kg (126 to 187 lb)
Thermal motor monitoring	With motor temperature monitoring equipment SD241B or similarly certified tripping unit for thermistor temperature sensors.
Motor	BD80... .. BD112...
Sensors	Position transmitter and temperature sensor always available
Operating mode	S9; stall-proof as per IEC 60034-1 / EN 60034-1
IP rating	IP 66 acc. to IEC 60529 / EN 60529; Ex protection IP6x acc. to EN 60079-31
Humidity	≤ 95% annual average; condensation not permitted
Ambient temperature	-20 to 60 °C (-4 to 140 °F) (reduced operating speed at rated load and below -10 °C (14 °F))
Transport and storage temperature	-20 to 60 °C (-4 to 140 °F)
Long-term storage temperature	-20 to 40 °C (-4 to 104 °F)
Mounting position	IMV 1; IMV 3; IMB 5; preferably IMV 1 acc. to IEC 60034-7 / EN 60034-7 RSDE10 / RSDE20 The mounting position IMB 5 (handwheel down) is not permitted in the case of applications in Zones 21 and 22. RSDE50 Mounting position IMV 3 is not permissible for RSDE50 120 mm stroke.
Coating	2-layer component epoxy (RAL 9005, black)
Anti-condensation heater	Motor winding: directly from electronic unit. Signal space: separate heating resistor; separate power supply or power feed from Contrac electronic unit
Electrical connection	Terminals in explosion e area; separately for motor and signals Connection cable for electronic unit – actuator available as an option (see ordering information for electronic unit)
Power supply for motor and sensors	Via Contrac electronic unit only

Table 3: Specification – Linear actuator

Electronic units

EBN853 / EBN861 for field mounting

IP rating	IP 66 in accordance with IEC 60529 / EN 60529 NEMA 4X in accordance with CAN / CSA22.2 No. 94
Humidity	≤ 95% annual average; condensation not permitted
Ambient temperature	-25 to 55 °C (-13 to 131 °F)
Transport and storage temperature	-25 to 70 °C (-13 to 158 °F)
Weight	EBN853: 11 kg (24 lbs) EBN861: 40 kg (88 lbs)
Power supply	115 V AC (94 to 127 V) or 230 V AC (190 to 253 V); 47.5 to 63 Hz; single-phase
Maximum cable length between actuator and electronic unit	100 m (328 ft)

Table 4: Specification – Electronic units for field mounting

EBS852 / EBS862 for rack mounting

IP rating	IP 20
Humidity	≤ 75 % annual average; condensation not permitted
Rack air inlet temperature	0 to 45 °C (32 to 113 °F)
Transport and storage temperature	-25 to 70 °C (-13 to 158 °F)
Mounting position	EBS852: vertical; lateral connections, right EBS862: vertical; cable glands down
Vibration stress	2 to 9 Hz: maximum deflection: 3 mm (0.12 in) 9 to 200 Hz: acceleration: 1 g
Long-term storage temperature	-25 to 40 °C (-13 to 104 °F)
Weight	EBS852: 11 kg (24 lb) EBS862: 40 kg (88 lb)
Power supply	115 V AC (94 to 127 V) or 230 V AC (190 to 253 V); 47.5 to 63 Hz; single-phase
Maximum cable length between actuator and electronic unit	Depending on cable cross-section, maximum 470 m (1542 ft)

Table 5: Specification – Electronic units for rack mounting

Motor temperature monitoring unit

SD241-B

IP rating	IP 54
Operating temperature	-25 to 60 °C (-13 to 140 °F)
Transport and storage temperature	-25 to 70 °C (-13 to 158 °F)
Supply voltage	115 V AC (94 to 127 V) or 230 V AC (190 to 253 V); 50 / 60 Hz; single-phase

Table 6: Specification – Motor temperature monitoring unit

Trademarks

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