EAS822 (Contrac)
Electronic unit

For the continuous control of Contrac actuators PME120-AN and LME620-AN

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Processor-controlled electronic unit according to the frequency converter principle

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Power supply 115 V AC or 230 V AC

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

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Digital communication via RS232 and HART

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

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Simple configuration and parameter setting via graphical user interface

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Torque and speed variation

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Continuous positioning

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Reliable for short positioning times

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Brief description

The electronic unit builds the interface between the actuator and the control system.

During continuous positioning, the electronic unit varies the motor torque continuously 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.

Operating principles

The actuator continuously responds to a set point signal. The motor is permanently under voltage (operating mode S9 - 100 % stall-proof according to IEC 60034-1 / EN 60034-1) and gently increases or reduces the torque on the electronic unit in proportion to the ΔY signal (the difference between the Y set point and the Y position signal).

The actuator is not subject to temperature derating, i.e., there are no restrictions, even at the maximum permissible ambient temperature. Where a state of balance exists, the actuator force and process force are equivalent and the actuator keeps the final control element in the required position.

The classification of the 'S9 - 100 % overload protected' Contrac actuator in accordance with IEC 60034-1 / EN 60034-1 by far exceeds the requirements for the highest class, 'continuous modulation, class D' in accordance with EN 15714-2.

The Contrac actuator offers extensive process optimization capabilities thanks to its high-precision and highly dynamic operation.

Electronic unit

Electronic units are available for assembly in the field near the actuator, remotely in a mounting rack or for integrated assembly (smallest actuator type). In addition to the terminals, the electronic unit contains the microprocessor, frequency converter for motor control, analog and binary inputs and outputs, PROFIBUS® or HART® communication interfaces, the commissioning and service field and a plug connection to connect a PC.

No matter what the motor power of the respective actuator is, all electronic units are supplied single-phase by 230 V or 115 V mains supply (50 Hz or 60 Hz).

The commissioning and service field enables the end positions and direction of rotation to be set on the actuator. Moreover, status information is displayed using LEDs. Push buttons can be used to operate the actuator and set the operating mode (Automatic, Out of Service).

Analog signal and power input

For analog control, the set point entry is received from the control system through a 0 to 20 mA or 4 to 20 mA current value. Signal monitoring is possible. Should the signal leave the pre-defined limits, the actuator will perform the set safety procedure (e. g. 'Lock in last position' or 'Drive to safety position').

The position feedback is also given through a 0 to 20 mA or 4 to 20 mA feedback signal. There are 3 digital inputs and 3 digital outputs available in addition to the analog signal.

If a digital input is activated, it will take priority over the set point signal (manual mode takes priority over automatic mode).

The following digital input configurations are possible:

Configuration	Digital input 1	Digital input 2	Digital input 3
OFF	No function	No function	No function
Manual intervention	Manual mode / Automatic mode switching	Travel command in OPEN direction	Travel command in CLOSE direction
Rapid traverse	Rapid traverse mode / Automatic mode switching	Rapid traverse travel command in OPEN direction	Rapid traverse travel command in CLOSE direction
Step controller	ON / OFF step controller activation	Step controller pulses in OPEN direction	Step controller pulses in CLOSE direction

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... Brief description

... Analog signal and power input

The digital output function is freely selectable for each output. The following functions are available:

Function	Description
Ready to operate	Signaling of device status.
Signal end position 0 %	Actuator has reached the 0 % position.
Signal end position 100 %	Actuator has reached the 100 % position.
Signal limit value 1 rising	While the signal level is rising, the actuator has reached the position defined as limit value 1.
Signal limit value 1 falling	While the signal level is falling, the actuator has reached the position defined as limit value 1.
Signal limit value 2 rising	While the signal level is rising, the actuator has reached the position defined as limit value 2.
Signal limit value 2 falling	While the signal level is falling, the actuator has reached the position defined as limit value 2.
Collective failure	Drive function is no longer given. The actuator is no longer available.
Collective alarm	Parameters in the Contrac interface system have adopted values, which make a failure in the near future likely. The actuator remains functional.
Local operation	The actuator is operated via the local control station (ISF)
Rapid traverse + direction	Actuator is moving at rapid traverse speed in + direction (only for 2-motor version).
Rapid traverse control −direction	Actuator is moving at rapid traverse speed in − direction (only for 2-motor version).

Step controller operation

In the 'step controller' operating mode the incoming control commands are received as pulses at digital inputs 2 and 3 these are upward-integrated into an internal memory. The memory uses these pulses to generate an 'artificial' internal set point which the actuator then follows. This process is as easy on the control valve and actuator operation as the analog control process.

Rapid traverse mode

The actuator is operated exactly in the same operating mode as in the analog control mode. On activation of digital inputs 2 or 3, the actuator moves at twice the rated operating speed and half the torque in the corresponding direction. Just before the end position is reached, the actuator travel speed is automatically switched back to the set speed, at which the remaining distance is covered.

Speed

Contrac actuators offer different speed adjustments for both directions, independently of actuator torque or actuator force. Furthermore, a speed characteristics curve can be set with three different speed values for each direction. The actuator speed is steplessly adapted to the rate of change in speed of the set point value. This ensures a highly dynamic and extremely precise control process. In order to preserve the control valve, the actuator speed is automatically reduced before the end position is reached.

Torque/Force

The torque and actuator force setting options are comparable to the speed setting options. 50 %, 75 % and 100 % of the rated output value can be selected. The electronic unit alters the motor actuation according to the selected value.

Set point monitoring

The set point can be monitored for compliance with the adjustable limit values. Should the set point exceed the upper limit value or fall below the lower limit value, the actuator will perform the previously defined safety action. 'Lock in current Position' or 'Move to pre-defined safety position' are available as safety actions.

Ambient conditions

Temperature
Different temperature versions are available, dependent on the actuator type.
The power-up period is not subject to derating, i.e. even at the maximum permissible ambient temperature, the actuator ensures maximum control precision and dynamics during a power-up period of 100 %.

Corrosion protection
Contrac actuators and electronic units have been designed for operation in extreme ambient conditions. They satisfy the requirements of atmospheric corrosivity category C5-I (highly polluted industrial atmospheres) for protection against external corrosion in accordance with DIN EN 15714 (Electric actuators for industrial valves – Basic requirements), and EN ISO 12944-2:1998 (Paints and varnishes. Corrosion protection of steel structures by protective paint systems. Classification of environments).
Electronic cabinet modules satisfy the requirements of category C1 (low pollution) as per EN ISO 12944-2:1998 (Paints and varnishes. Corrosion protection of steel structures by protective paint systems. Classification of environments).

Maintenance interval
Contrac actuators and electronic units exceed the service life requirements for the highest class D, 'continuous modulation', as per DIN EN 15714 (Electric actuators for industrial valves – Basic requirements). The actuators remain maintenance-free for up to 10 years under 'normal' load.

Expected service life of the device
With proper use and consideration of relevant environmental conditions, the service life of the Contrac actuators and electronic units can reach approx. 10 years.

Regular maintenance work and / or proper repairs by ABB Service, along with the use of ABB spare parts, can extend the service life of the Contrac actuators and electronic units.

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Communication

HART

Contrac actuators also offer the option of using the HART® communication protocol for configuration and parameterization while operation is in progress. HART®-FSK communication enables simultaneous analog set point transmission and digital communication without additional installation. The HART signal is modulated on to the 4 to 20 mA analog set point signal. The HART® protocol works with Frequency Shift Keying (FSK) technology, based on the Bell 202 communication standard.

FDI – Field Device Integration

The Device Type Driver for Contrac actuators is based on FDI technology and can either be integrated in a control system or loaded onto a PC with the ABB Ability™ Field Information Manager (FIM).
This allows you to work with the same user interface in the commissioning phase, during operation, and for service tasks involving monitoring the device, parameterization, and reading out data.

DTM

The DTM (Device Type Manager) for Contrac actuators is based on FDT / DTM technology (FDT 1.2 / 1.2.1) and can either be integrated into a control system or loaded on a PC with an FDT framework application. This allows you to work with the same user interface in the commissioning phase, during operation, and for servicing tasks, involving monitoring the device, setting parameters, and reading out data. Communication is based on HART® protocol or PROFIBUS® communication. Reading out data from the device has no effect on the operation in progress. Newly set parameters are saved in the non-volatile memory directly upon download to the device, and become active immediately.

EDD

Similar to DTM, the EDD (Electronic Device Description) provides the option of configuration and parameterization of the device through HART® communication by using a handheld terminal or an EDD integrated in the system.

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Specification

General information

EAS822	
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)
Long-term storage temperature	−25 to 40 °C (−13 to 104 °F)
Mounting position	Vertical; lateral connections, right
Vibration stress	2 to 9 Hz: maximum deflection: 3 mm (0.12 in)
	9 to 200 Hz: acceleration: 1 g
Paint	2-layer component epoxy (RAL 9005, black)
Electrical connection	Mains supply via screw terminals; all other connections made via screw-type plug connectors
	Maximum cable length electronic unit – actuator: *
	480 m at 4.0 mm^2 (1575 ft at 12 AWG)
Weight	9 kg (20 lbs)

* The maximum cable length depends on the actuator type and cable cross-section, see 'Actuator assignment and maximum cable lengths' in the operating instruction.

Power supply

EAS822					
Supply voltage (standard actuators)	115 V AC (94 to 130 V) or 230 V AC (190 to 260 V); 47.5 to 63 Hz; single-phase				
Power consumption	50 / 160 W				
Average power loss P_{avg} and power consumption I_{max}	Actuator	P_{avg}	I_{max} at 115 V	I_{max} at 230 V	I_{pos} (115 V + 230 V):
of the electronic unit	PME120-AN	60 W	1.0 / 1.4 A*	0.5 / 0.7 A*	approx. 40 to 50 % of I_{max}
	LME620-AN	60 W	1.0 / 1.4 A*	0.5 / 0.7 A*	
External fuse for electronic unit	16 A, time-lag				
External fuse for heating (dewing protection)	2 to 6 A, medium time-lag				

* For low-temperature version

Communication

Conventional communication	
Analog input	0 / 4 to 20 mA, internal load: 300 Ω
Analog output	0 / 4 to 20 mA, electrically isolated, maximum load: 500 Ω
3 digital inputs, 1 to 3	Digital 0: −3 to 5 V or open, electrically isolated
	Digital 1: 12 to 35 V, electrically isolated
3 digital outputs, 1 to 3	Potential-free relay contact, max. 60 V, 150 mA
Digital communication	RS232 for commissioning and service, optionally FSK / HART®
Default settings	See Table **Conventional communication**
Voltage output U_V	24 V, 15 mA, electrically isolated, for scanning external contacts, or similar applications
Connection for transmitter (optional)	Supply for two-wire transmitter with activated process controller in Contrac
Individual settings	See data sheet 'DS/CONTRAC/SETTING' or available upon request.

Delivery status

Conventional communication	
Parameter	**Setting**
Function selection	Positioner, parameter: set point
Set point function	Analog set point
Set point range	4 to 20 mA
Set point characteristic	Linear; set point = position value
Actual value range	4 to 20 mA
Nominal torque / rated force in ±direction	100 %
Automatic speed in ±direction:	100 %
Action in 0 % / 100 % end position	Keep tight with nominal torque/rated force
Digital inputs	Digital input 1 Manual / Automatic switching,
	Digital input 2 / 3 Travel command ±
Digital outputs	Digital output 1 ready for operation / error message,
	Digital output 2/3 end position signal 0 %/100 %
Brake Away Function	Deactivated
Shut-off function	Deactivated
Positioning loop monitoring	Deactivated
Set point monitoring	Deactivated
Alarm Type	Deactivated
Action after restoration of power	Switch to Automatic
Working range of actuator	Not set

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Electrical connections

Wire cross-sectional areas

EAS822 – Clamping connection

|	Suited for cable Ø	Terminals for conductor cross-section
Mains cable	13 mm (0.51 in)	max. 4 mm^2 (12 AWG)
Signal cable (DCS)	8 mm (0.31 in)	max. 1.5 mm^2 (16 AWG)
Transmitter (option)	8 mm (0.31 in)	max. 1.5 mm^2 (16 AWG)
Motor cable	13 mm (0.51 in)	max. 4 mm^2 (12 AWG)
Sensor cable	8 mm (0.31 in)	max. 1.5 mm^2 (16 AWG)

Selection of suited connection cables

Please observe the following information when selecting cables:

- Use shielded cables for the motor/brake cable, the sensor cable, and the signal cable to the control system/controller.
- Connect the shielding of the motor/brake cable and the sensor cable on both sides (to the actuator and to the Contrac electronic unit).

Electronic unit EAS822 (Contrac)

Note
- The electrical connection is provided by a universal plug on the actuator and the screw terminals 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).
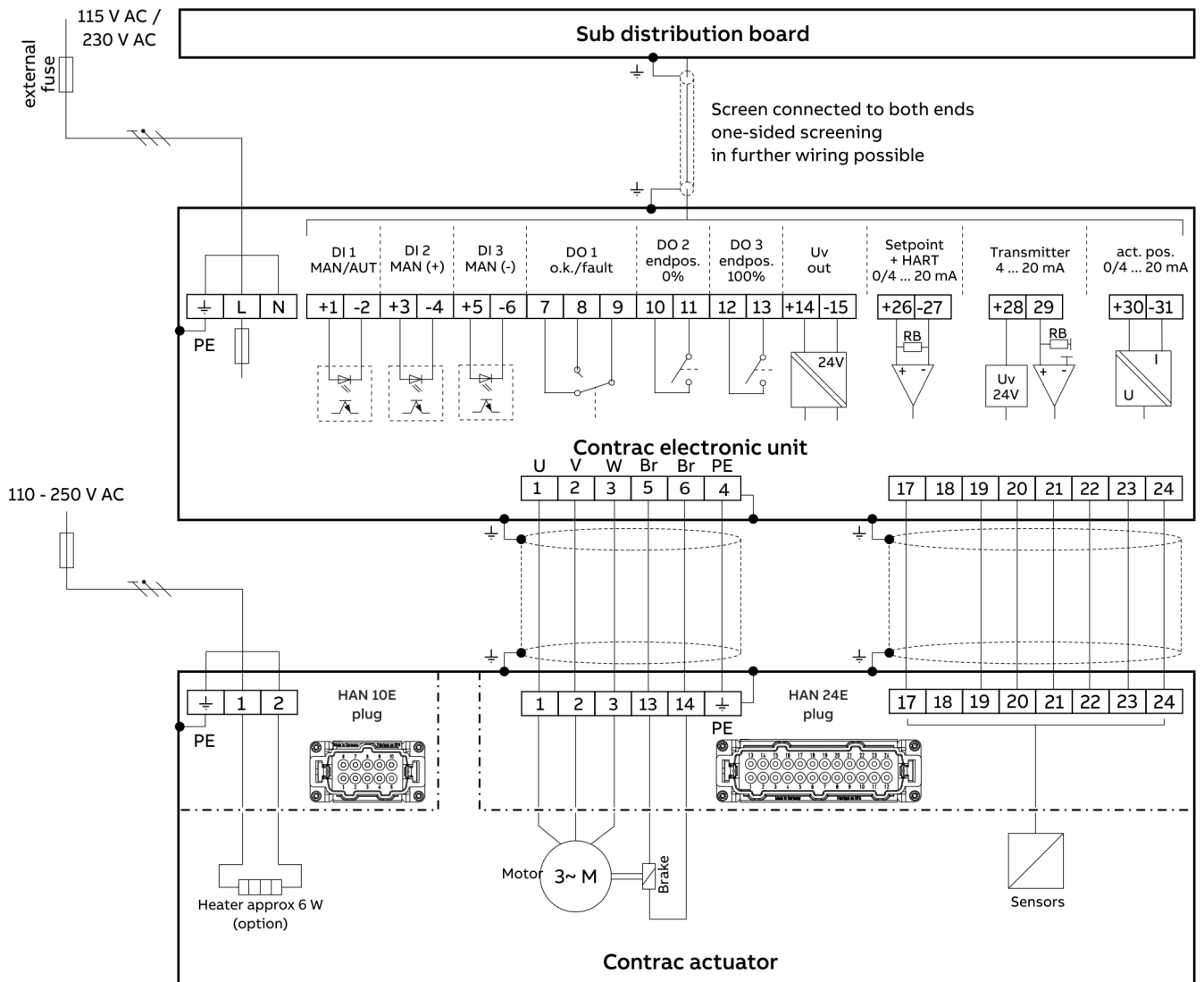
BE = digital input

BA = digital output

Figure 1: Control via analog input 0/4 to 20 mA, HART® communication or digital inputs
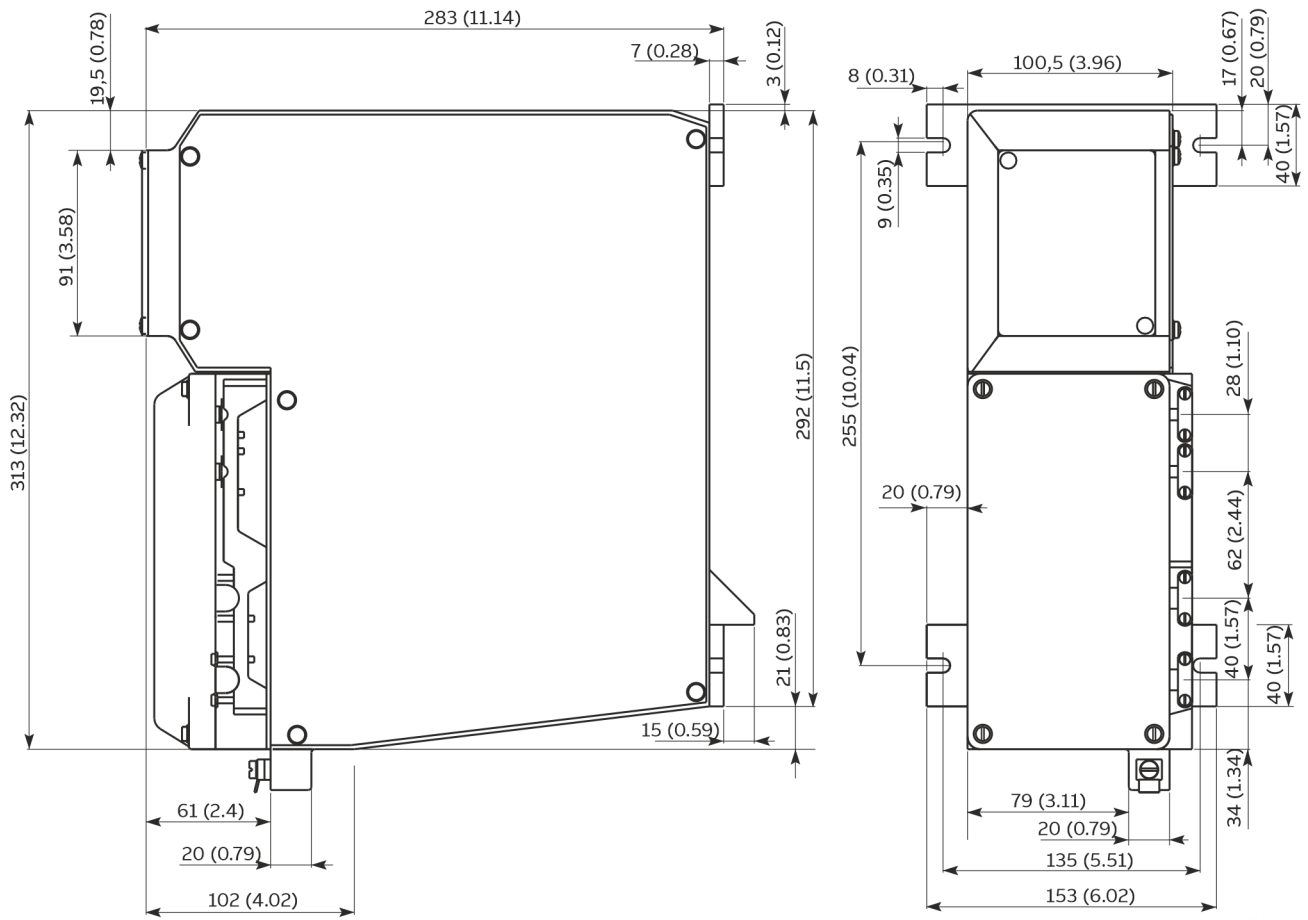
Dimensions

Figure 2:   Dimensions in mm (in)

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Ordering Information

EAS822

Basic model	V68822A	XXXX	XXX	XXX	XXX	XXX	XXX	XXX
EAS822 Electronic Unit, for rack mounted installation								
Suitable for								
Part-Turn Actuator PME120-AN		0001						
Linear Actuator LME620-AN		0002						
Adjusted to								
100 Nm (80 ft-lbs) // 4.5°/s // 20 s/90°			310					
4 kN (900 lbf) // 2.0 mm/s // 30 s/60 mm (12.7 s/in)			320					
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		
Ambient Temperature Range of Actuator								
−10 to 65 °C (15 to 150 °F)							344	
−25 to 55 °C (−15 to 130 °F)							343	
−1 to 85 °C (30 to 185 °F) (Only for PME120-AN, max. 2°/s)							349	
Settings of Electronic Unit								
Standard settings (see technical data)								390
Customer-specific settings (see data sheet 10/68-2.40 EN)								391

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... Ordering Information

... EAS822

Additional ordering information EAS822

	1	2	3	4	5	6	7	8	9	10
EAS822 Electronic Unit, for rack mounted installation	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX	XXX
Anti-condensation Heater in Actuator "ON"										
Anti-condensation heater in actuator "ON"	359									
Identification on Data Label										
(Alphanumeric, max. 32 characters)		295								
Data Label with US Units										
Data label with US units			253							
F. No. of associated Actuator on Data Label of Electronic Unit										
F. No. of associated actuator on data label of electronic unit (Available only as "Special				297						
Factory Certificate 2.1 acc. to EN 10204										
Factory certificate 2.1 acc. EN 10204					291					
Certificate 3.1 acc. to EN 10204										
Certificate 3.1 acc. EN 10204						292				
UKCA										
UKCA							293			
Handling of Certificates								GHE		
Send via e-mail								GHP		
Send via mail								GHD		
Send via mail express								GHA		
Send with instrument								GHS		
Only archived								GHE		
Operating Instruction										
German									Z1D	
English									Z1E	
Portuguese									Z1P	
Italian									Z1I	
French									Z1F	
Positioner / Controller Function										
Positioner function										238
Process controller function										239

Accessories

Description	Ordering number
RHD(E) / RSD(E) / PME / LME Save & Restore Tool ECOM700 for Contrac electronic units with software version ≥ 2.0	3KXE911100L0001
RHD(E) / RSD(E) / PME / LME Save & Restore Tool ECOM688 for Contrac electronic units with software version < 2.0	3201110
RHD(E) / RSD(E) / PME / LME PC connection cable, 3 m cable with 9-pole Sub-D connector and 9-pole Sub-D female connector	746349

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Trademarks

HART is a registered trademark of FieldComm Group, Austin, Texas, USA

Sales   **Service**

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Notes

ABB

ABB Measurement & Analytics

For your local ABB contact, visit:
www.abb.com/contacts

For more product information, visit:
www.abb.com/actuators