SIEMENS

SIPART PS2

6DR50xx
6DR51xx
6DR52xx
6DR53xx

Edition 10/2006

Manual

Electropneumatic Positioner for
Linear and Part-Turn Actuators

Degree of protection

The device is designed with IP66/NEMA4x degree of protection.

Explosion Protection

The intrinsically safe version can be used in hazardous areas in zone 1 or zone 2.
The explosion proof version can be used in hazardous areas in zone 1 or zone 2.
The version with the type of protection “n” can be used in hazardous areas of zone 2.

SIL applications

The SIPART PS2 positioners in the variations 6DR501*, 6DR511*, 6DR521* and 6DR531* (i.e. with 0/4 up to 20 mA control signal in the single-acting design) are also suitable for positioning on fittings with pneumatic actuators, which satisfy the special requirements for safety devices up to SIL 2 to IEC 61508/ IEC 61511-1. For this, the SIL safety instructions (see “SIPART PS2 SIL safety manual” A5E00442120) must be followed.

Options

The positioner can be expanded with various options modules (chapter 2.7, page 27). The following modules are available in all:

- $_{Iy}$-module: Two-wire current output 4 to 20 mA for position feedback
- Alarm module: 3 digital outputs and 1 digital input
- SIA module: one digital output for fault messages, two digital outputs for limit value alarms

Accessories

- Manometer block: 2 or 3 manometers for single and double-acting positioners
- Connection block (NAMUR) for safety valve block
- Mounting kits for linear and part-turn actuator

For decentralized installation of the positioner and position sensor:

- External position detection system
- Non-Contacting Position Sensor (NCS)

Environmental Protection

Only environmentally friendly materials have been used in the construction of the positioner.

The technical manual is printed on chlorine-free bleached paper.

☞ **NOTE**

Use standard M20 x 1.5 cable gland nuts to ensure leakage (IP-protection of the housing) and for the necessary tensile strength use only cables with a cable diameter ≥ 8 mm, or for smaller diameters use a suitable sealing insert.

For the NPT version, the positioner will be delivered with an adapter. Make sure that when fitting a part into the adapter, that the maximum permissible torque of 10 Nm is not exceeded.

NOTE for use in zone 2:

Non-sparking equipment for Zone 2 may not be connected or disconnected under power in normal operation.

However, during installation or repair work the positioner may be connected or disconnected even under power (see also certificate for zone 2).

NOTE for use in two-wire systems:

Never connect the current input (terminal 6 and 7) to a voltage source as this could destroy the positioner.

Always use a current source with a maximum output current of 20 mA.

To maintain the power supply, the input current must be ≥3.6 mA.

3.4.1 Connection in non-intrinsically safe and explosion proof version

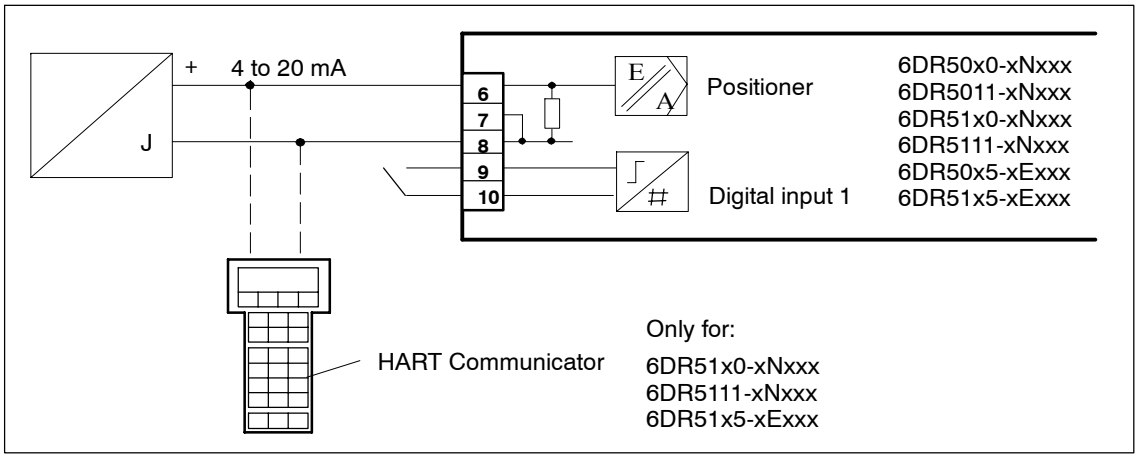

Figure 3-13 Two-wire connection

Standard controller

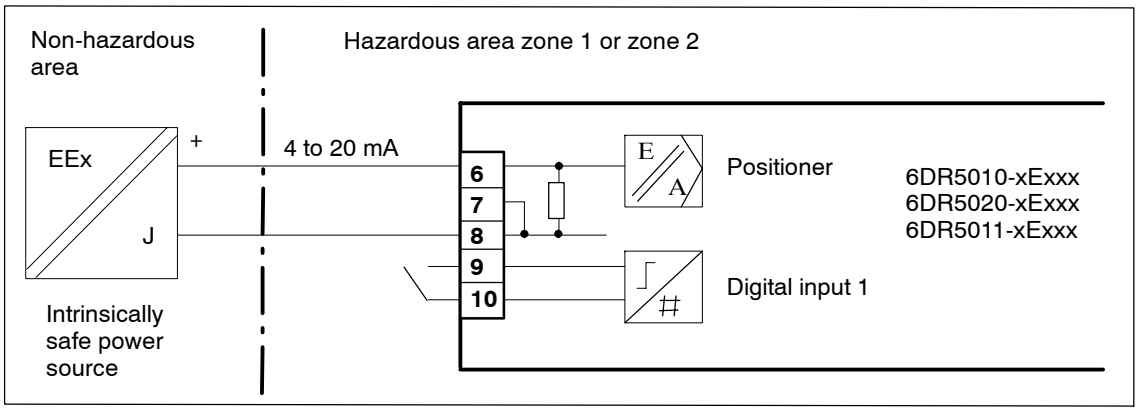

Figure 3-20 Two-wire connection, EEx i

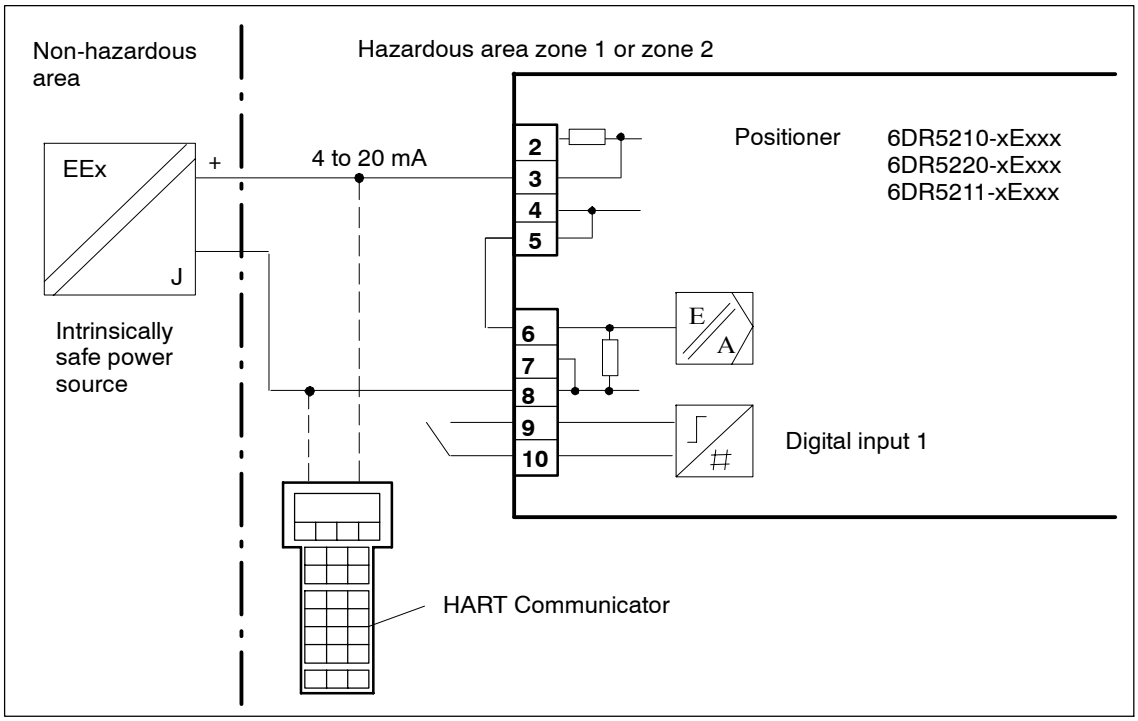

Figure 3-21 Two-wire connection, EEx i

3.4.3 Connection in type of protection “n” version

Standard controller

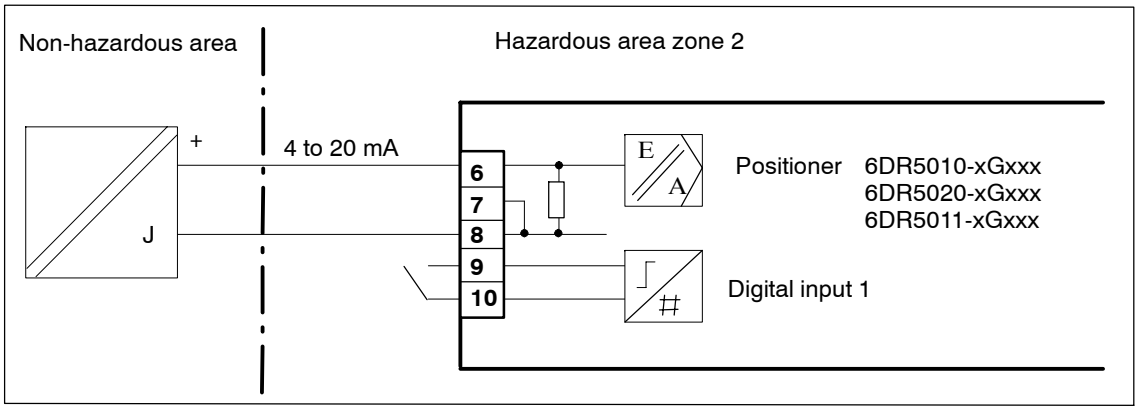

Figure 3-28 Two-wire connection, EEx n

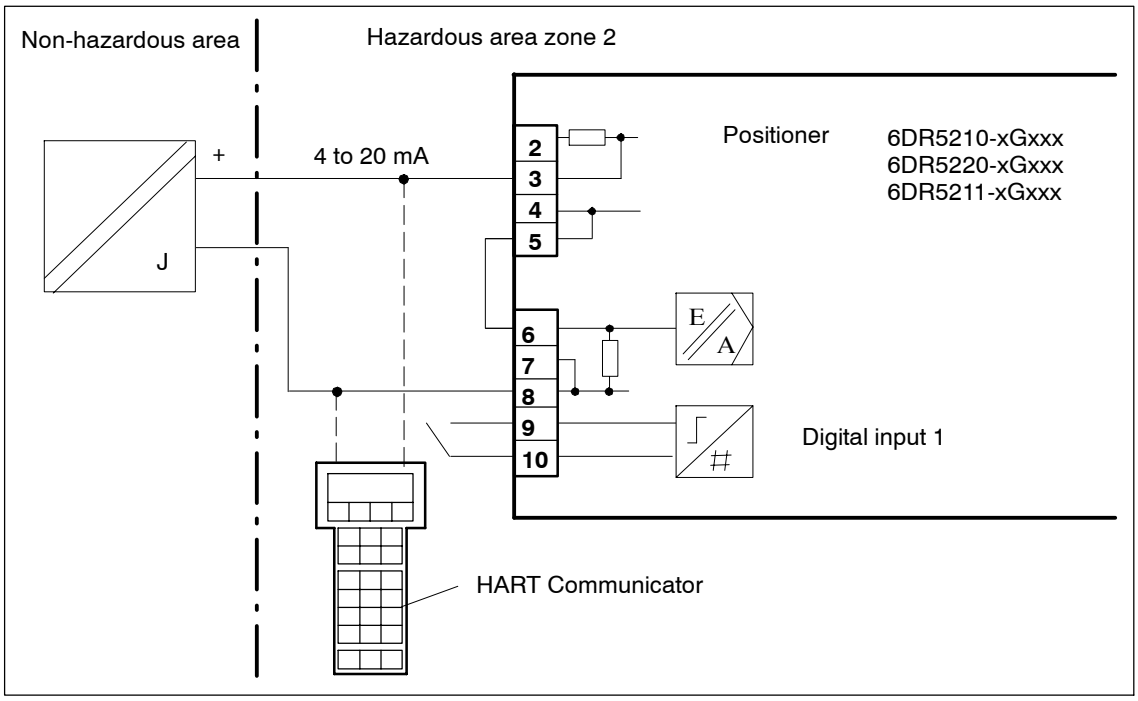

Figure 3-29 Two-wire connection, EEx n

Technical Data

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General data for basic device 6DR50xx
6DR51xx
6DR52xx
6DR53xx

(see following pages)

Technical specifications

SIPART PS2	Basic device without Ex protection	Basic device with EEx-d protection (flameproof casing)	Basic device with EEx ia/ib protection	Basic device with EEx n protection
Explosion protection to EN 50014, EN 50020 and EN 50021	Without	EEx d II 2 G EEx d II C T6	EEx ia/ib II 2 G EEx ia/ib II C T6	EEx n II 3 G EEx nA L [L] II C T6
Mounting location		Zone 1	Zone 1	Zone 2
Permissible ambient temperature for operation At ≤ -10 °C (+14 °F) the display refresh rate of the LCD is limited. (for basic devices with EEX ia/ib and EEx n protection the following applies: Only T4 is permissible when using I_y module.)	-30 ... +80 °C (-22 ... +176 °F)	T4: -30 ... +80 °C (-22 ... +176 °F) T5: -30 ... +65 °C (-22 ... +149 °F) T6: -30 ... +50 °C (-22 ... +122 °F)		
Electrical data				
Input				
2-wire connection (terminals 6/8)				
Rated signal range	4 ... 20 mA	4 ... 20 mA	4 ... 20 mA	4 ... 20 mA
Current to maintain the power supply	≥ 3.6 mA	≥ 3.6 mA	≥ 3.6 mA	≥ 3.6 mA
Required load voltage U_B (corresponds to Ω at 20 mA)				
• Without HART (6DR50..)				
- Typical	6.36 V (corresponds to 318 Ω)	6.36 V (corresponds to 318 Ω)	7.8 V (corresponds to 390 Ω)	7.8 V (corresponds to 390 Ω)
- Max.	6.48 V (corresponds to 324 Ω)	6.48 V (corresponds to 324 Ω)	8.3 V (corresponds to 415 Ω)	8.3 V (corresponds to 415 Ω)
• Without HART (6DR53..)				
- Typical	7.9 V (corresponds to 395 Ω)	–	–	–
- Max.	8.4 V (corresponds to 420 Ω)	–	–	–
• With HART (6DR51..)				
- Typical	6.6 V (corresponds to 330 Ω)	6.6 V (corresponds to 330 Ω)	–	–
- Max.	6.72 V (corresponds to 336 Ω)	6.72 V (corresponds to 336 Ω)	–	–
• With HART (6DR52..)				
- Typical	–	8.4 V (corresponds to 420 Ω)	8.4 V (corresponds to 420 Ω)	8.4 V (corresponds to 420 Ω)
- Max.	–	8.8 V (corresponds to 440 Ω)	8.8 V (corresponds to 440 Ω)	8.8 V (corresponds to 440 Ω)
• Static destruction limit	± 40 mA		–	–
Internal capacitance C_i				
• Without HART	–	–	≤ 22 nF	–
• With HART	–	–	≤ 7 nF	–
Internal inductance L_i				
• Without HART	–	–	≤ 0.12 mH	–
• With HART	–	–	≤ 0.24 mH	–
For connection to power circuits with	–	–	intrinsically safe U_o ≤ 30 V DC I_k ≤ 100 mA P ≤ 1 W	U_i ≤ 30 V DC I_i ≤ 100 mA

7.1 Scope of delivery of standard controller

Versions	Housing	Valve	Ex-protection	Order numbers
SIPART PS2 2L without HART	Plastic housing	single action	non Ex	6DR5010-xNxxx-0AA0
	Plastic housing	double action	non Ex	6DR5020-xNxxx-0AA0
	Metal housing	single action	non Ex	6DR5011-xNxxx-0AA0
SIPART PS2 2L without HART	Plastic housing	single action	CENELEC/FM	6DR5010-xExxx-0AA0
	Plastic housing	double action	CENELEC/FM	6DR5020-xExxx-0AA0
	Metal housing	single action	CENELEC/FM	6DR5011-xExxx-0AA0
	Explosion proof housing	single action	CENELEC/FM	6DR5015-xExxx-0AA0
	Explosion proof housing	double action	CENELEC/FM	6DR5025-xExxx-0AA0
SIPART PS2 2L with HART	Plastic housing	single action	non Ex	6DR5110-xNxxx-0AA0
	Plastic housing	double action	non Ex	6DR5120-xNxxx-0AA0
	Metal housing	single action	non Ex	6DR5111-xNxxx-0AA0
SIPART PS2 4L with HART	Plastic housing	single action	CENELEC/FM	6DR5210-xExxx-0AA0
	Plastic housing	double action	CENELEC/FM	6DR5220-xExxx-0AA0
	Metal housing	single action	CENELEC/FM	6DR5211-xExxx-0AA0
	Explosion proof housing	single action	CENELEC/FM	6DR5215-xExxx-0AA0
	Explosion proof housing	double action	CENELEC/FM	6DR5225-xExxx-0AA0
SIPART PS2 4L without HART	Plastic housing	single action	non Ex	6DR5310-xNxxx-0AA0
	Plastic housing	double action	non Ex	6DR5320-xNxxx-0AA0
	Metal housing	single action	non Ex	6DR5311-xNxxx-0AA0

2L corresponds to two-wire operation
4L corresponds to four-wire-operation
–x stands for sub-variant

7.2 Scope of delivery of options

Option	Order number
I_y- module without protection against explosion	6DR4004-8J
I_y- module with protection against explosion PTB [1)] I_y- module with protection against explosion FM[2)]	6DR4004-6J 6DR4004-7J
Alarm unit without protection against explosion	6DR4004-8A
Alarm unit with protection against explosion PTB [1)] Alarm unit with protection against explosion FM [2)]	6DR4004-6A 6DR4004-7A
SIA-module without protection against explosion	6DR4004-8G
SIA-module with protection against explosion CENELEC and FM [1)2)]	6DR4004-6G
Limit-contact module without protection against explosion	6DR4004-8K
Limit-switch module with protection against explosion CENELEC and FM [1)2)3)]	6DR4004-6K

1) EC-type examination certificate
2) Approval Reports from Factory Mutual System
3) In preparation

7.4 List of Spare Parts

Spare parts list: SIPART PS2 positioner			
	Description	Order No.	for version
	Cover (plastic enclosure) with screws (4 pcs) and seal	C73451-A430-D82	6DR4___ 6DR5___
	Cover (metal enclosure) with screws (4 pcs) and seal	C73451-A430-D83	6DR4___ 6DR5___
	Motherboard, two-wire without HART, without explosion protection	A5E00082459	6DR50__–_N 6DR40__–_N *)
	Motherboard, two-wire without HART, with explosion protection	A5E00082457	6DR50__–_E
	Motherboard, two-wire HART, without explosion protection	A5E00082458	6DR51__–_N 6DR40__–_N *)
	Motherboard, two-,three-,four-wire HART, with explosion protection	A5E00082456	6DR52__
	Motherboard Two-,three-,four-wire without HART, without expl. protect.	A5E00102018	6DR53__–_N 6DR40__–_N *)
	Motherboard PROFIBUS PA, without explosion protection	A5E00141523	6DR55__–_N.. 6DR41__–_N
	Motherboard PROFIBUS PA, with explosion protection	A5E00141550	6DR55__–_E 6DR41__–_E
	Motherboard FIELDBUS Foundation, without explosion proof	A5E00215467	6DR56__
	Motherboard FIELDBUS Foundation, with explosion protection	A5E00215466	6DR56__
	Pneumatic block (Valve single acting incl. seals and screws)	C73451-A430-D80	6DR4___ 6DR5___
	Pneumatic block (Valve double acting incl. seals and screws)	C73451-A430-D81	6DR4___ 6DR5___
	Potentiometer (complete)	C73451-A430-D84	6DR4___ 6DR5___

*) 6DR40.. can be used after having clarified whether application with two-wire or three-wire/four-wire input

Note: For accesories and option modules see Catalog FI 01 “Field Instruments for Process Automation”