

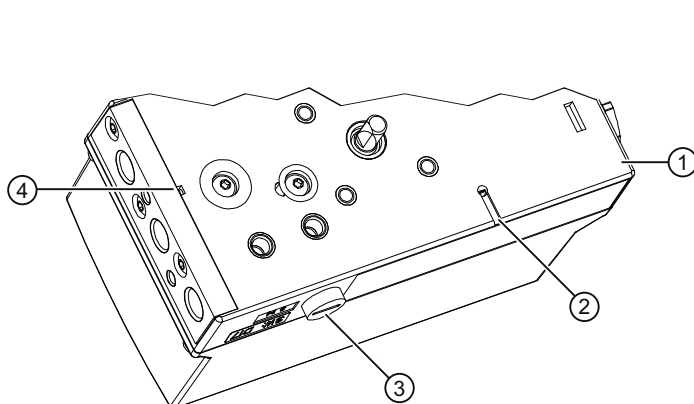
7.1.5.3 Maximal permissible ambient temperature ranges

Positioner and option modules	Temperature class T4	Temperature class T6
Positioner		
• 6DR5ayb-0cdef-g*Ah-Z jjj	-30 °C ≤ Ta ≤ +80 °C	-30 °C ≤ Ta ≤ +50 °C
• 6DR5ayb-0cdef-g*Ah-Z M40	-40 °C ≤ Ta ≤ +80 °C	-40 °C ≤ Ta ≤ +50 °C
• 6DR5ayb-0cdef-g*Ah-Z jjj for a = 0, 1, 2 and f = 0, 2	-30 °C ≤ Ta ≤ +80 °C	-30 °C ≤ Ta ≤ +60 °C
• 6DR5ayb-0cdef-g*Ah-Z M40 for a = 0, 1, 2 and f = 0, 2	-40 °C ≤ Ta ≤ +80 °C	-40 °C ≤ Ta ≤ +60 °C
Option modules		
• Non-Contacting Sensor (NCS) 6DR4004-6N	-40 °C ≤ Ta ≤ +90 °C	-40 °C ≤ Ta ≤ +70 °C
• Position Transmitter (Potentiometer) 6DR4004-1ES	-40 °C ≤ Ta ≤ +90 °C	-40 °C ≤ Ta ≤ +60 °C
• Position Transmitter (NCS) 6DR4004-2ES	-40 °C ≤ Ta ≤ +90 °C	-40 °C ≤ Ta ≤ +50 °C
• Position Transmitter (NCS, ILS) 6DR4004-3ES		
• Position Transmitter (NCS, MLS) 6DR4004-4ES		

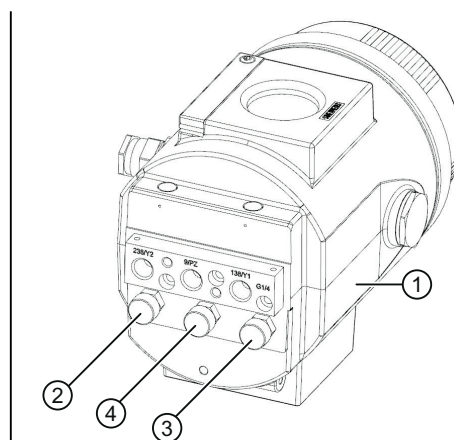
7.1.6 Natural gas as actuator medium

Introduction

For operation with natural gas, note that used natural gas escapes at the exhaust air outlets.



- ① Base plate
- ② Exhaust air outlet enclosure ventilation



- ③ Exhaust air outlet sound absorber
- ④ Exhaust air outlet near the pneumatic connections

Note

The following applies for exhaust air outlet with sound absorber ③:

The positioner is supplied as standard with a sound absorber. To provide an outlet for the exhaust air, replace the sound absorber by a G¼ pipe coupling.

The following applies for enclosure ventilation ② and control air outlet ④:

1. With the "flameproof enclosure" device version in an aluminum enclosure with order suffix -Z K50 "Operation with natural gas", you can completely collect and discharge the escaping natural gas.
2. In all other device versions, the escaping natural gas is released into the environment.

Maximum values for escaping natural gas

- The quantity of escaping natural gas is negligible during regulated operation.
- If a control error occurs, a maximum of 30 NI/min of natural gas will escape at the enclosure vent ② and a maximum of 89 NI/min at the control air outlet ④.

7.2 With 4 to 20 mA/HART

7.2.1 Electrical data

	Basic electronics without explosion protection	Basic electronics with explosion protection Ex "db"	Basic electronics with explosion protection Ex "ia", "db ia"	Basic electronics with explosion protection Ex "ic", "ec", "tb"
Current input I_w				
• Rated signal range			4 ... 20 mA	
• Test voltage			840 V DC, 1 s	
• Digital input DI1 (terminals 9/10; galvanically connected to basic device)		Suitable only for floating contact; max. contact load < 5 µA with 3 V		
2-wire connection				
6DR50.. and 6DR53.. 4 ... 20 mA				
6DR51.. and 6DR52.. HART				
Current to maintain the auxiliary power			≥ 3.6 mA	
Required load voltage U _B (corresponds to Ω at 20 mA)				
• 4 to 20 mA 6DR50..				
Typical	6.36 V (= 318 Ω)	6.36 V (= 318 Ω)	7.8 V (= 390 Ω)	7.8 V (= 390 Ω)

	Basic electronics without explosion protection	Basic electronics with explosion pro- tection Ex "db"	Basic electronics with explosion pro- tection Ex "ia", "db ia"	Basic electronics with explosion pro- tection Ex "ic", "ec", "tb"
Max.	6.48 V (= 324 Ω)	6.48 V (= 324 Ω)	8.3 V (= 415 Ω)	8.3 V (= 415 Ω)
• 4 to 20 mA 6DR53..				
Typical	7.9 V (= 395 Ω)	-	-	-
Max.	8.4 V (= 420 Ω)	-	-	-
• HART 6DR51..				
Typical	6.6 V (= 330 Ω)	6.6 V (= 330 Ω)	-	-
Max.	6.72 V (= 336 Ω)	6.72 V (= 336 Ω)	-	-
HART 6DR52..				
Typical	-	8.4 V (= 420 Ω)	8.4 V (= 420 Ω)	8.4 V (= 420 Ω)
Max.	-	8.8 V (= 440 Ω)	8.8 V (= 440 Ω)	8.8 V (= 440 Ω)
• Static destruction limit	± 40 mA	± 40 mA	-	-
Effective inner capacitance C_i	-	-		
• 4 to 20 mA	-	-	11 nF	"ic": 11 nF
• HART	-	-	11 nF	"ic": 11 nF
Effective inner inductance L_i	-	-		
• 4 to 20 mA	-	-	209 μH	"ic": 209 μH
• HART	-	-	312 μH	"ic": 312 μH
For connecting to circuits with the following peak values	-	-	$U_i \leq 30$ V $I_i \leq 100$ mA $P_i \leq 1$ W	"ic": $U_i \leq 30$ V $I_i \leq 100$ mA "ec"/"tb": $U_n \leq 30$ V $I_n \leq 100$ mA
3-/4-wire connection				
6DR52.. HART, explosion proof				
6DR53.. 4 ... 20 mA, non-explosion-proof				
Load voltage at 20 mA	≤ 0.2 V (= 10 Ω)	≤ 0.2 V (= 10 Ω)	≤ 1 V (= 50 Ω)	≤ 1 V (= 50 Ω)
Auxiliary power U_{Aux}	18 ... 35 V DC	18 ... 35 V DC	18 ... 30 V DC	18 ... 30 V DC
• Current consumption I_{Aux}	$(U_{Aux} - 7.5$ V) / 2.4 kΩ [mA]			
For connecting to circuits with the following peak values	-	-	$U_i \leq 30$ V $I_i \leq 100$ mA $P_i \leq 1$ W	"ic": $U_i \leq 30$ V $I_i \leq 100$ mA "ec"/"tb": $U_n \leq 30$ V $I_n \leq 100$ mA
Effective inner capacitance C_i	-	-	22 nF	22 nF
Effective inner inductance L_i	-	-	0.12 mH	0.12 mH
Galvanic isolation	Between U_{Aux} and I_W	Between U_{Aux} and I_W	Between U_{Aux} and I_W (2 intrinsically safe circuits)	Between U_{Aux} and I_W

7.2.2 Electrical data for pressure sensor module

	Basic electronics without explosion protection	Basic electronics with explosion protection Ex "db"	Basic electronics with explosion protection Ex "ia", Ex "db ia"	Basic electronics with explosion protection Ex "ic", "ec", "tb"
Basic electronics for the pressure sensor module				
6DR51.. -Z P01 und -Z P02 HART, non-Ex				
6DR51.. -Z P01 und -Z P02 HART, Ex				
Current input I_w				
• Rated signal range	4 ... 20 mA			
• Test voltage	840 V DC, 1 s			
• Digital input DI1 (terminals 9/10; galvanically connected to basic device)	Suitable only for floating contact; max. contact load < 5 μ A with 3 V			
Current to maintain the auxiliary power	≥ 3.6 mA			
Required load voltage U_b (corresponds to Ω at 20 mA)	9.4 V (= 470 Ω)	9.4 V (= 470 Ω)	9 V (= 450 Ω)	9 V (= 450 Ω)
Static destruction limit	± 30 V	± 30 V	-	-
Effective inner capacitance C_i	-	-	12.2 nF	"ic": 12.2 nF
Effective inner inductance L_i	-	-	105 μ H	"ic": 105 μ H
For connecting to circuits with the following peak values	-	-	$U_i \leq 30$ V $I_i \leq 100$ mA $P_i \leq 1$ W	"ic": $U_i \leq 30$ V $I_i \leq 100$ mA "ec"/"tb": $U_n \leq 30$ V $I_n \leq 100$ mA

7.2.3 Communication (HART)

HART communication	
HART version	7
PC parameter assignment software	SIMATIC PDM; supports all device objects. The software is not included in the scope of delivery.