SIPART DR Input/Output Modules

Analog signal modules		SIPART DR19 Slot	SIPART DR20 Slot	SIPART DR21 Slot	SIPART DR22 Slot	SIPART DR24 Slot	Description see page
U/I module	6DR2800-8J	1/2	1/2	1/2	2/3	2/3	8/3
3 U/I modules	6DR2800-8A	–	–	–	–	6	8/4
R module	6DR2800-8R	1/2	1/2	1/2	2/3	2/3	8/5
Pt 100 module	6DR2800-8P	1/2	1/2	1/2	2/3	2/3	8/6
TC module	6DR2800-8T	1/2	1/2	1/2	2/3	2/3	8/7
UNI module (TC/RTD/R/U/I)	6DR2800-8V	1	–	1	–	–	8/8
y-hold module	6DR2802-8A	–	–	–	6	6	8/10

Switching signal modules		SIPART DR19 Slot	SIPART DR20 Slot	SIPART DR21 Slot	SIPART DR22 Slot	SIPART DR24 Slot	Description see page
5 DI	6DR2801-8C	3	–	3	5/6	5/6	8/11
2 relays	6DR2801-8D	3	GW	3	5/6	5/6	8/12
4DO/2DI	6DR2801-8E	3	GW	3	5/6[1]	5/6[1]	8/13

Interface module		SIPART DR19 Slot	SIPART DR20 Slot	SIPART DR21 Slot	SIPART DR22 Slot	SIPART DR24 Slot	Description see page
SES module	6DR2803-8C						8/14
	RS 232/SIPART bus	4	4	4	4	4	
	RS 485	4	–	4	–	–	
PROFIBUS DP module	6DR2803-8P	4	4	4	4	4	8/15

Coupling relay module can be installed on rear of following controllers		SIPART DR19	SIPART DR20	SIPART DR21	SIPART DR22	SIPART DR24	Description see page
with 4 relays	6DR2804-8A	Yes	–	Yes	Yes	Yes	8/15
with 2 relays	6DR2804-8B	Yes	–	Yes	Yes	Yes	8/15

Depending on the application, the following can be used in conjunction with the UNI module 6DR2800-8V and SIPART DR19/AE1		Description see page
Reference junction terminal	6DR2805-8A	8/8
Measuring range connector	6DR2805-8J	8/8

[1] Only 4 DO/1DI effective.

Analog signal modules

- U/I module 6DR2800-8J for current and voltage input

This input/output module enables a current or voltage signal to be connected. The module is used to extend the number of analog inputs and provides electronic isolation through a differential amplifier with high common mode rejection.

The changeover between current and voltage input is handled by coding jumpers on the module itself. In addition, the wiring of the connector is different.

The signal range 0 to 20 mA, 4 to 20 mA, 0 to 1 V, 0.2 to 1 V, 0 to 10 V or 2 to 10 V as well as the assignment to the function inputs is determined when the controller is configured.

The input impedance is 49.9 Ω if the module is being used as a current input. Owing to the high common mode rejection, several inputs or another consumer can be connected in series.

The input impedance is 200 kΩ if the module is being used as a voltage input.

The screw-type terminal is part of the scope of supply.

| Technical data 6DR2800-8J		
U/I module	Current	Voltage
Start of measuring range	0 or 4 mA	0 or 0.2 V or 2 V
End of measuring range	20 mA	1 V or 10 V
Output range	−0.8 to 23 mA	−4 % to 115 %
Input impedance		
– difference	49.9 Ω ± 0.1 %	200 kΩ
– common mode	500 kΩ	≥ 200 kΩ
Permitted common mode voltage (rated range)	0 to +10 V	0 to +10 V
Filter time constant ± 20 %	50 ms	
Error without A/D conversion		
– zero	≤ 0.3 %	≤ 0.2 %
– gain	≤ 0.5 %	≤ 0.2 %
– linearity	≤ 0.05 %	≤ 0.05 %
– common mode	≤ 0.07 %/V	≤ 0.02 %/V
Variation with temperature without A/D conversion		
– zero	≤ 0.05 %/10 K	≤ 0.02 %/10 K
– gain	≤ 0.1 %/10 K	≤ 0.1 %/10 K
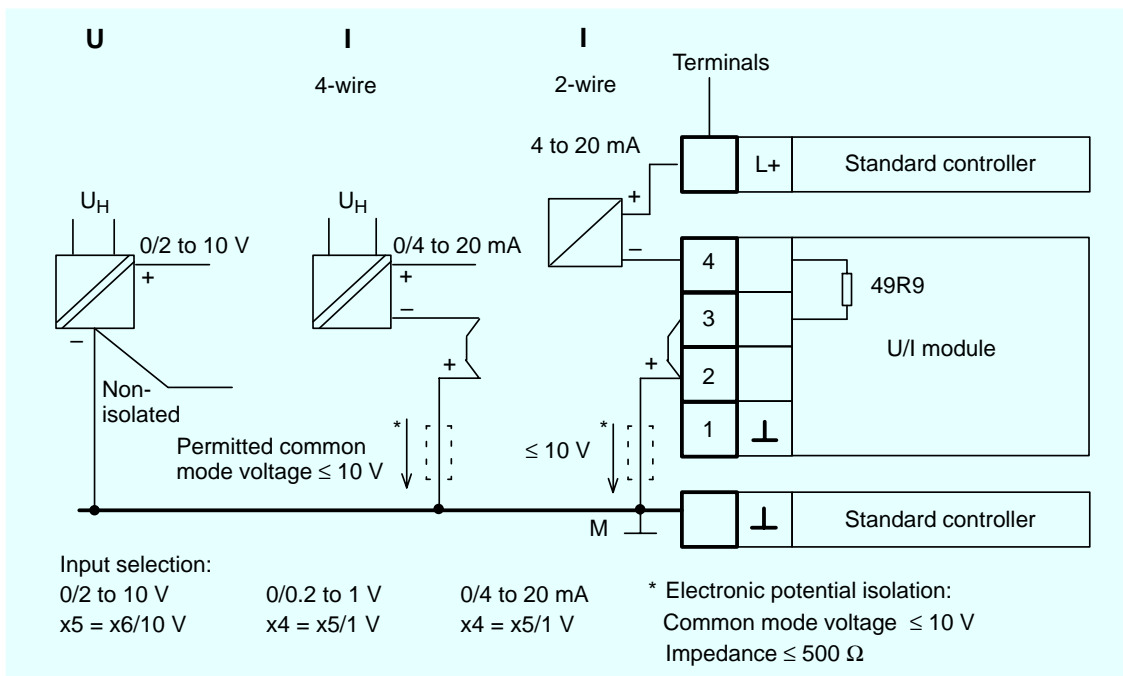
Fig. 8/1   Wiring of U/I module 6DR2800-8J

SIPART DR Input/Output Modules

Analog signal modules

- Three 6DR2800-8A U/I modules for current and voltage input

This input/output module has 3 channels (inputs) for connecting current or voltage signals. The module is used to extend the number of analog inputs in the SIPART DR24 multi-function unit and provides electronic isolation through a differential amplifier with high common mode rejection.

Each channel can be switched separately to accept current or voltage signals. The switchover is performed using jumpers on the module itself. In addition, the wiring for I or U signals is different.

The changeover between current and voltage input is handled by coding jumpers on the module itself. In addition, the wiring of the connector is different.

The signal range 0 to 20 mA, 4 to 20 mA, 0 to 1 V, 0.2 to 1 V, 0 to 10 V or 2 to 10 V as well as the assignment to the function inputs is determined when the controller is configured.

The input impedance is 49.9 Ω if the module is being used as a current input. Owing to the high common mode rejection, several inputs or another consumer can be connected in series.

The input impedance is 200 kΩ if the module is being used as a voltage input.

The screw-type terminal is part of the scope of supply.

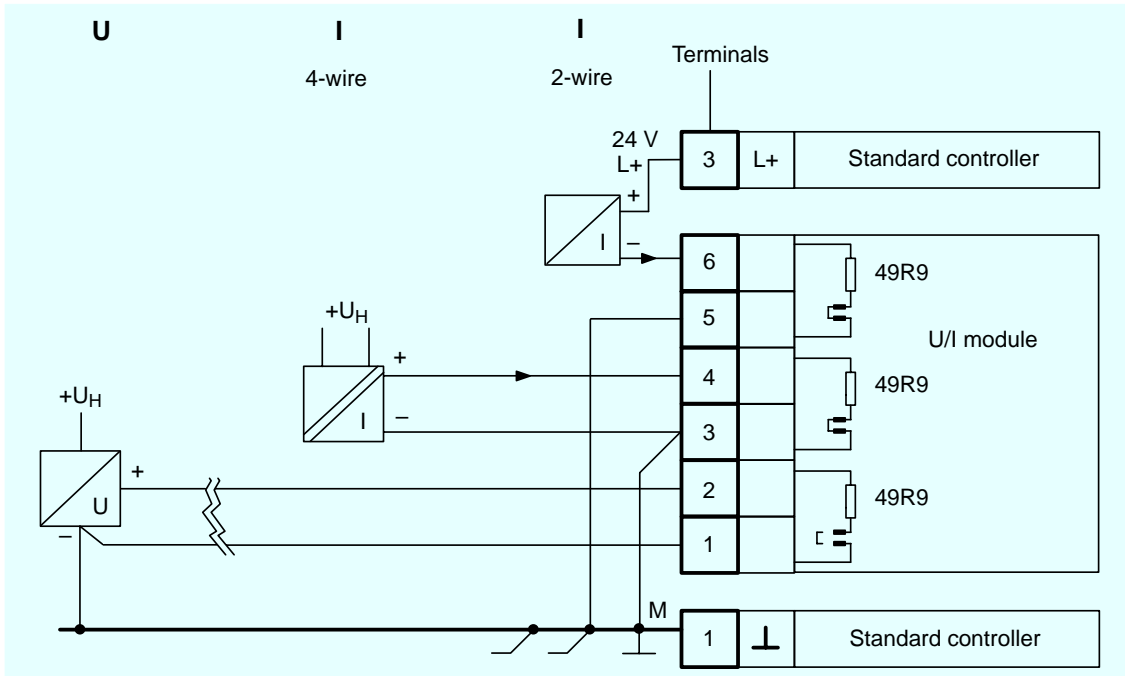| Technical data 6DR2800-8A		
Three U/I modules	**Current**	**Voltage**
Start of measuring range	0 or 4 mA	0 or 0.2 V or 2 V
End of measuring range	20 mA	1 V or 10 V
Output range	–0.8 to 23 mA	–4 % to 115 %
Input impedance – difference – common mode	49.9 Ω ± 0.1 % 500 kΩ	200 kΩ ≥ 200 kΩ
Permitted common mode voltage (rated range)	0 to +10 V	0 to +10 V
Filter time constant ± 20 %	50 ms	
Error without A/D conversion – zero – gain – linearity – common mode	≤ 0.3 % ≤ 0.5 % ≤ 0.05 % ≤ 0.07 %/V	≤ 0.2 % ≤ 0.2 % ≤ 0.05 % ≤ 0.02 %/V
Variation with temperature without A/D conversion – zero gain – gain	≤ 0.05 %/10 K ≤ 0.1 %/10 K	≤ 0.02 %/10 K ≤ 0.1 %/10 K

Fig. 8/2   Three U/I modules 6DR2800-8A

Analog signal modules

- R module 6DR2800-8R for resistance input (potentiometer)

This input/output module allows a potentiometer with a rated resistance of between 80 and 1200 Ω to be connected. The signal range (80 to 220 Ω, 200 to 500 Ω or 470 to 1200 Ω) is selected using jumpers on the module.

Trimming of the start of scale and full scale values is performed once the module is inserted using a potentiometer on the rear of the module.

The assignment to the function inputs is determined when the controller is configured.

This module can also be configured as a current input. It is best used when the start of scale and full scale values of the current signal do not exactly match the standard signal ranges and need to be trimmed. The input impedance is 49.9 Ω in this case.

The input is not isolated.

The screw-type terminal is part of the scope of supply.

Technical data 6DR2800-8R	
R module	
Start of measuring range	$0\ \Omega$
– span, min.	$\Delta R \geq 0.3 \cdot R$
– max. zero suppression	$R_A \leq 0.2 \cdot R$
– end	$R_A + 1.1 \cdot R$
	R in 3 spans
	200 – 500 – 1000 Ω adjustable
Output range	–5 % to 105 %
Supply current	5 mA ± 5 %
Line resistors R_i	
– two-wire circuit	–
– three-wire circuit	< 10 Ω each
– four-wire circuit	–
Filter time constants ± 20 %	50 ms
Error without A/D conversion	
– zero	≤ 0.2 %
– gain	≤ 0.2 %
– linearity	≤ 0.2 %
Variation with temperature without A/D conversion	
– zero	≤ 0.1 %/10 K
– gain	≤ 0.3 %/10 K

$$Rp = \frac{R \cdot 200\,\Omega}{R - 200\,\Omega}$$

Setting:
20 mA   R < 200 Ω

R < 1 kΩ
or
R < 500 Ω
or
R < 200 Ω

Compensation:

1. Set measuring range on the module
2. Set RA to start of scale value
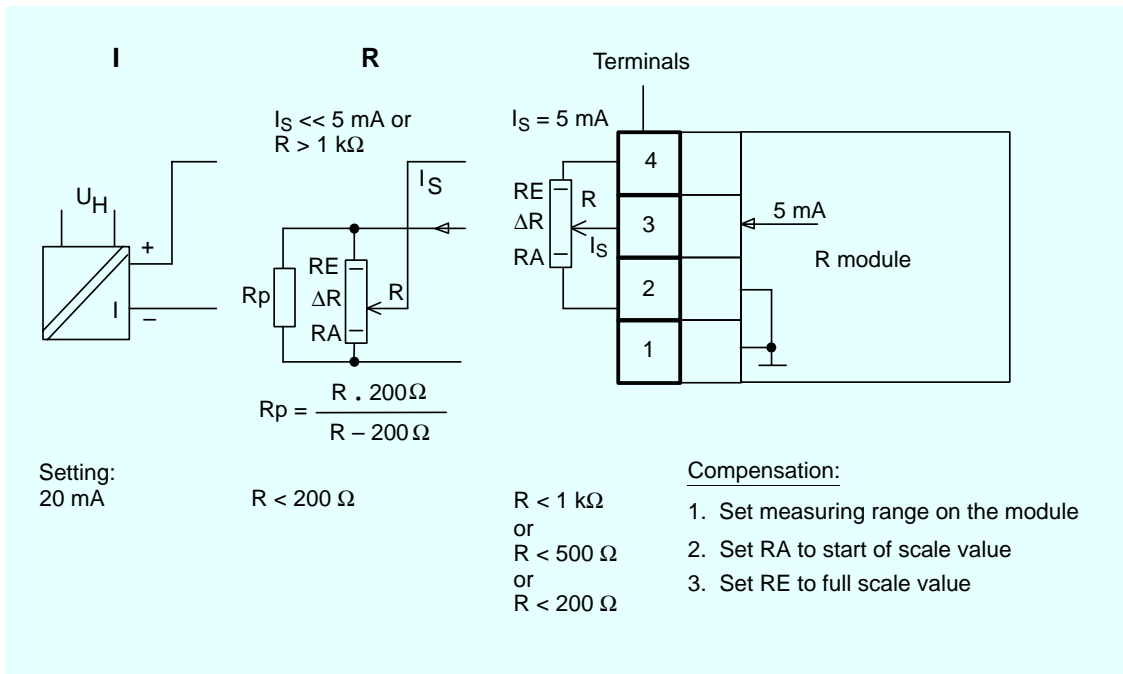3. Set RE to full scale value

Fig. 8/3   Wiring of R module 6DR2800-8R

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SIPART DR Input/Output Modules

Analog signal modules

- Pt 100 module 6DR2800-8P for Pt 100 resistance thermometers

Via this input/output module, a Pt 100 resistance thermometer (RTD) can be connected.

Note:

The type of connection, two-wire, three-wire or four-wire, and the start of scale and full scale values are selected using jumpers on the module. The jumper settings can be found in the relevant SIPART DR20, SIPART DR22 and SIPART DR24 manuals.

Trimming of the start of scale and full scale values is performed once the module is inserted using a potentiometer on the rear of the module.

The input has a differential amplifier and is electronically isolated.

The output signal is temperature linear.

The screw-type terminal is part of the scope of supply.

| Technical data 6DR2800-8P	
Pt 100 module	
Start of measuring range	$R_{tA} \geq 80.25\ \Omega$ $(t_A \geq -50\ °C)$
– span, min.	$\Delta R = 19\ \Omega$ $(\Delta t = 50\ °C)$
– max. zero suppression	$R_{tA} \leq 5 \cdot \Delta R$
– end	$R_{tE} \leq 390.26\ \Omega$ $(t_E \leq 850\ °C)$
Supply current Line resistors R_j	100 mV/ΔR
– two-wire circuit	$R_{L1} + R_{L2} \leq 10\ \Omega$
– three-wire circuit	$R_{L1} = R_{L2} = R_{L3} \leq 50\ \Omega$
– four-wire circuit	$R_L \leq 80\ \Omega$
Filter time constants ± 20 %	50 ms
Error without A/D conversion	
– zero	≤ 0.1 %
– gain	≤ 0.1 %
– linearity	≤ 0.3 %
Variation with temperature without A/D conversion	
– zero	≤ 0.2 %/10 K
– gain	≤ 0.3 %/10 K
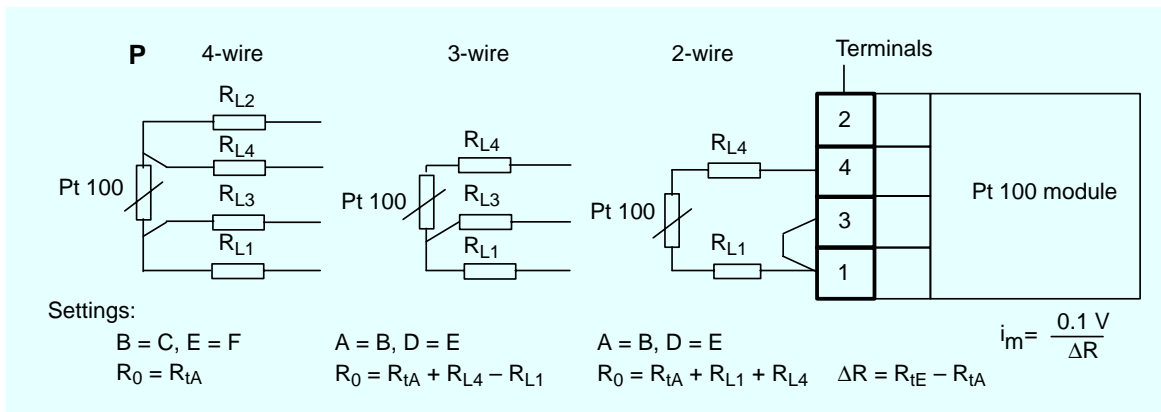
Fig. 8/4   Wiring of Pt 100 module 6DR2800-8P

8

Analog signal modules

- TC module 6DR2800-8T for thermocouples or other mV signals

A thermocouple or other voltage source can be connected directly using the TC module.

Reference junction compensation can take place either internally or externally. Internal compensation is implemented through a temperature sensor (included with the TC module) mounted on the terminal block.

The type of thermocouple, reference junction compensation method, start of scale and span, plus the response in the event of a sensor break (output goes high or low) are all determined using jumpers on the module.

The input/output module works on voltage linear principles and can be used for all thermoelectric e.m.f. or mV signals. Linearization must be performed using the lineariser in the standard controller if thermocouples are connected.

Note:

The jumper settings can be found in the relevant SIPART DR20, SIPART DR22 and SIPART DR24 manuals.

Trimming of the start of scale and full values is performed once the module is inserted using a potentiomer on the rear of the module.

The following thermocouple pairs can be connected:

according to DIN IEC 584, Part 1

– Cu-CuNi	(Type T)
– Fe-CuNi	(Type J)
– NiCr-Ni	(Type K)
– NiCr-CuNi	(Type E)
– Pt10Rh-Pt	(Type S)
– Pt13Rh-Pt	(Type R)
– Pt30Rh-Pt6Rh	(Type B)

according to DIN 43 710

– Cu-CuNi	(Type U)
– Fe-CuNi	(Type L)

This input/output module is electronically isolated.

The screw-type terminal is part of the scope of supply.

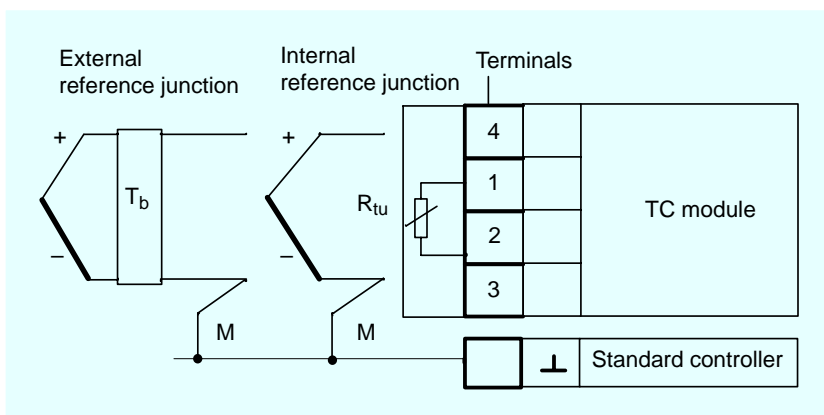| Technical data 6DR2800-8T	
TC module	
Start of measuring range	$-5 \cdot \Delta U \dots 0 \dots +5 \cdot \Delta U$
– span, min.	$\Delta U = 10$ mV
– max. zero suppression	$|U| \leq 5 \cdot \Delta U$
– end	$U \leq 60$ mV
Output range	–5 to 105 %
Input impedance	
– difference	2 MΩ
– common mode	1 MΩ
Permitted common mode voltage (rated range)	–10 to +10 V
Line resistances	$R_{L1} + R_{L2} \leq 300$ Ω
Filter time constant ± 20 %	20 ms
Error without A/D conversion	
– zero	≤ 0.1 %
– gain	≤ 0.1 %
– linearity	≤ 0.1 %
– common mode	≤ 0.1 %/V
– reference junction compensation	≤ 2 °C
Variation with temperature without A/D conversion	
– zero	≤ 0.3 %/10 K
– gain	≤ 0.3 %/10 K
– reference junction compensation	≤ 0.5 %/10 K

Fig. 8/5   Wiring of TC module 6DR2800-8T

SIPART DR Input/Output Modules

- UNI module 6DR2800-8V for connecting

  – Pt 100 resistance thermometers (RTD)

  – Thermocouples (TC)

  – mV sources

  – Potentiometers (R)

  – U/I input (10 V/20 mA)

- Reference junction terminal 6DR2805-8A

- Measuring range connector 6DR2805-8J

This input/output module has galvanic isolation.

The following sensors can be connected.

  – Pt 100 resistance thermometers in 2, 3 or 4-wire circuits

  – Thermocouples with internal (reference junction terminal 6DR2805-8A required) or external reference junction

  – mV signals

  – Resistance based sensor (potentiometer) in 2-wire circuit

  – 10 V and 20 mA signals via an additional measuring range connector (6DR2805-8J)

The module is designed for use with the SIPART DR19 and SIPART DR21 controllers. The module is configured and set up in the configuring level StrS (configuring switches) and CAE (calibrate analog input) of these controllers. No settings need be made on the module itself.

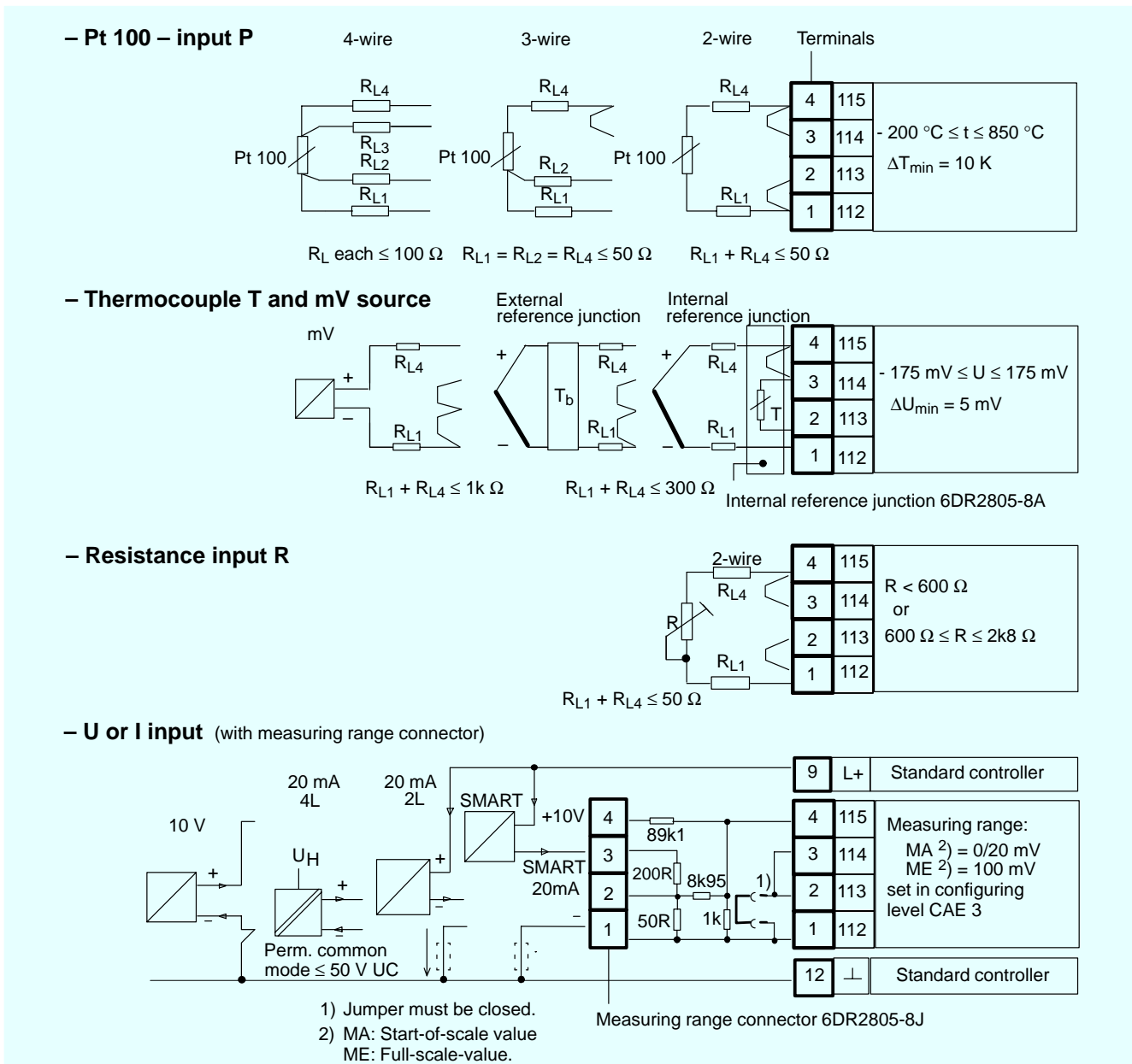The screw-type terminal is part of the scope of supply.

Fig. 8/6   Wiring of UNI module 6DR2800-8V

Analog signal modules

Technical data 6DR2800-8V

Pt 100 resistance thermometer

Line resistance	
– 2-wire circuit	Line resistance configurable $R_{Ab} = R_{L1} + R_{L4}$, or automatic calibration when configuring $R_{L1} + R_{L4} \leq 50\ \Omega$
– 3-wire circuit	No compensation necessary when $R_{L1} = R_{L2} = R_{L4}$ $R_{L1}, R_{L2}, R_{L4} \leq 50\ \Omega$
– 4-wire circuit	R_{L1} to $R_{L4} \leq 100\ \Omega$
Measuring current	400 µA
Measuring range, configurable	
start	MA $\geq$ –200 °C
end	ME $\leq$ +850 °C
Recommended min. span	10 K
Characteristic	Temperature linear
Filter time constant	< 2 s adaptive
Potential isolation	
permitted common mode voltage	$\leq$ 50 V AC/DC
Test voltage	500 V AC

Thermocouples

		Type
Thermocouples, configurable according to DIN IEC 584 Part 1	Cu-CuNi	T
	Fe-CuNi	J
	NiCr-Ni	K
	NiCr-CuNi	E
	Pt10Rh-Pt	S
	Pt13Rh-Pt	R
	Pt30Rh-Pt6Rh	B
	NiCrSi-NiSi	N
according to DIN 43 710	Cu-CuNi	U
	Fe-CuNi	L

Reference junction compensation	
internal	Reference junction terminal required
external	Temperature of the external reference junction configurable
Line resistance	$\leq$ 300 Ω
Measuring range, configurable	
start	$\geq$ –175 mV
end	$\leq$ +175 mV
Recommended min. span	5 mV
Characteristic, configurable	Voltage or temperature linear
Filter time constant	< 2 s adaptive
Input current	$\leq$ 1 µA
Potential isolation	
permitted common mode voltage	$\leq$ 50 V AC/DC
test voltage	500 V AC
Stat. destruction limit across inputs	$\pm$ 35 V

mV source

Measuring range, configurable	
start	$\geq$ –175 mV
end	$\leq$ +175 mV
Recommended min. span	5 mV
Line resistance	$\leq$ 1 kΩ
Characteristic	Voltage linear
Input current	$\leq$ 1 µA
Potential isolation	
permitted common mode voltage	$\leq$ 50 V AC/DC
test voltage	500 V AC
Stat. destruction limit across inputs	$\pm$ 35 V

Resistance based sensor R

	Measuring range	
Measuring range, configurable Measuring range limits incl. line resistance	$R_{tot} \leq 600\ \Omega$	$600\ \Omega \leq R_{tot} \leq 2.8\ k\Omega$
Recommended min. span.	30 Ω	70 Ω
Input current	290 µA	60 µA
Linearity error	$\pm$ 60 mΩ	$\pm$ 0.2 Ω

mA source
with additional measuring range connector 6DR2805-8J

Measuring range, can be compensated	
start	0/4 mA $\triangleq$ 0/20 mV
end	20 mA $\triangleq$ 100 mV
Transformation error	0.3 %
Input resistance	50 Ω
Smart input resistance	250 Ω
Potential isolation	
permitted common mode voltage	$\leq$ 50 V AC/DC
Stat. destruction limit across inputs	$\pm$ 40 mA

10 V-voltage source
with additional measuring range connector 6DR2805-8J

Measuring range, can be compensated	
start	0/2 V $\triangleq$ 0/20 mV
end	10 V $\triangleq$ 100 mV
Transformation error	0.2 %
Input resistance	90 kΩ
Potential isolation	
permitted common mode voltage	$\leq$ 50 V AC/DC
Stat. destruction limit across inputs	$\pm$ 100 V

SIPART DR Input/Output Modules

- *y*-hold module 6DR2802-8A
  analog output module with alarm output

The y-hold module is designed for use with the SIPART DR22 and SIPART DR24 controllers. It has a 0/4 to 20 mA analog output and a digital output for the CPU alarm signal ($\overline{St}$ = High).

When used with the SIPART DR22 controller, the analog output is permanently assigned the manipulated variable *y*.

The module contains a microprocessor that transfers data in serial mode to and from the processor in the controller. If the transfer of data is interrupted, the analog output retains the last manipulated variable and the CPU alarm output is triggered ($\overline{St}$ = Low).

The module can be powered via an external supply, which is ORed with the internal supply on the module. This enables the manipulated variable *y* to be retained if:

- the controller's power supply fails
- the *y*-hold module is removed and the controller replaced.

The screw-type terminal is supplied with the module.

Technical data 6DR2802-8A	
y-hold module	
Analog output	
Rated signal range	0 to 20 mA or 4 to 20 mA
Load voltage	
– Supplied from controller	–1 to +18 V
– External supply	
(U_H > 22.5 V)	–1 to +15 V
Max. permitted inductivity	≤ 0.1 H
Digital output $\overline{St}$	
Signal status 0	≤ 1.5 V
Signal status 1	+19 to 26 V
On-load current	≤ 30 mA
Short-circuit current	≤ 50 mA pulsed
Power supply U_H	
– Voltage range	20 to 30 V
– Power consumption of U_H	
when on external supply	≤ 70 mA
when supplied from	
controller	Approx. 6 mA
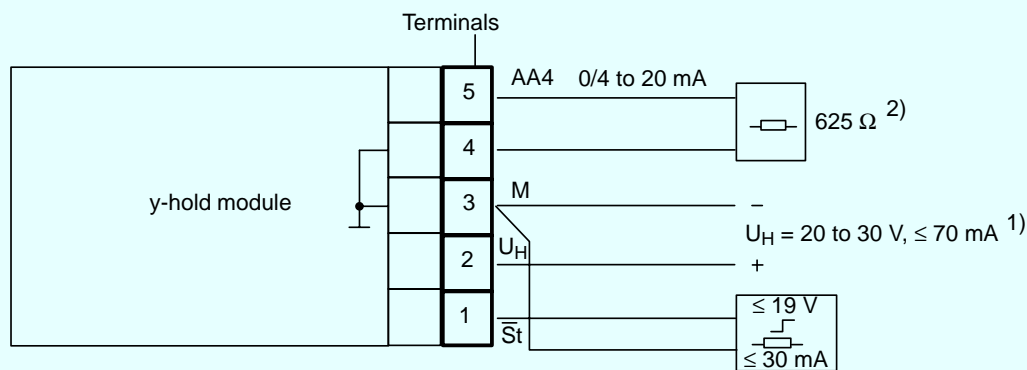
1) U_H need only be connected if the output current has to be retained should the power supply to the multi-function unit fail or the module is removed when servicing.

2) Up to 900 Ω possible, depending on the power supply.

Fig. 8/7   *y*-hold module 6DR2802-8A

8

Switching signal modules

• 5DI module 6DR2801-8C for additional digital inputs

Module with 5 digital inputs.

Assignment of functions and the logic is performed using the configuring switches.

The screw-type terminal is supplied with the module.

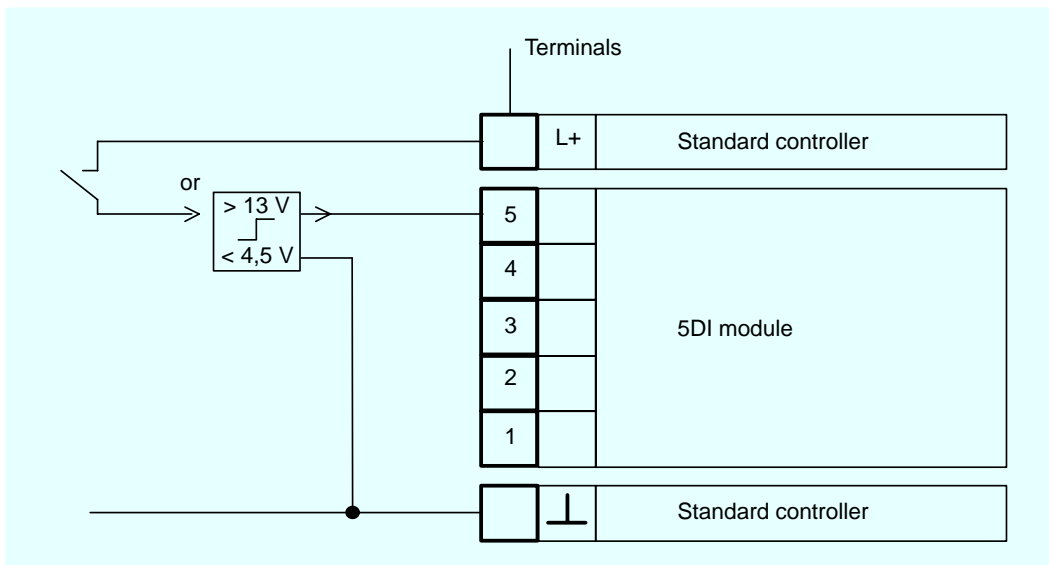| Technical data 6DR2801-8C	
5DI module	
Signal status "0"	≤ 4.5 V or open
Signal status "1"	≥ 13 V
Input resistance	≥ 27 kΩ
Static destruction limit across inputs	± 35 V

Fig. 8/8   Wiring of 5DI module 6DR2801-8C

**Assignment of the terminals to the digital input (DI);
depending on device version and slot**

	Digital input with:		
Terminal	SIPART DR19 and DR21	SIPART DR22 and DR24	
		Slot 5	Slot 6
5	BE7	BE9	BE14
4	BE6	BE8	BE13
3	BE5	BE7	BE12
2	BE4	BE6	BE11
1	BE3	BE5	BE10

Switching signal modules

- 2DO relay module 6DR2801-8D
  for additional digital outputs

Relay output module for 2 digital outputs.
Floating changeover contact, can take up to 35 V.

Assignment of functions and the logic is performed using the configuring switches.

The RC networks of the spark suppressors all lie parallel to the NC and NO contact. The current flowing via the spark suppressor capacitor (1 μF) when the contact is open (e. g. contactor withstand current) can cause interference in the case of AC consumers with a very low rating. Should this happen, the capacitors should be replaced by ones with a lower rating or be removed altogether.

The 68 V suppressor diodes connected in parallel to the contacts also have an effect and limit the induced voltage.

The screw-type terminal is supplied with the module.

Technical data 6DR2801-8D		
2DO relay module		
Contact material	Ag/Ni	
Contact rating	AC	DC
Max. switching voltage	$\leq$ 35 V	$\leq$ 35 V
Max. switching current	$\leq$ 5 A	$\leq$ 5 A
Max. switching capacity	$\leq$ 150 VA	$\leq$ 100 W at 24 V $\leq$ 80 W at 30 V
Service life Mechanical Electrical 24 V, 4 A, Ω loading Electrical 24 V, 1 A, inductive	$2 \cdot 10^7$ switching operations $2 \cdot 10^6$ switching operations $2 \cdot 10^5$ switching operations	
Spark suppressor	1 μF and 22 Ω connected in series, with 68 V suppressor diodes wired in parallel	

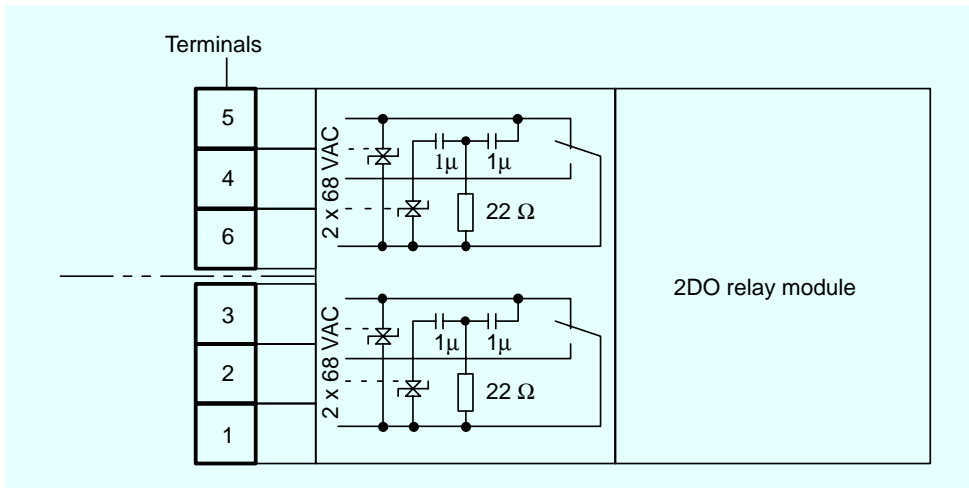

Fig. 8/9   Wiring of 2DO relay module 6DR2801-8D

**Assignment of the terminals to the digital output (DO);
depending on device version and slot**

	Relay output with:			
Terminals	SIPART DR19 and DR21	SIPART DR20	SIPART DR22 and DR24	
			Slot 5	Slot 6
4, 5, 6	BA4	A1	BA10	BA14
1, 2, 3	BA3	A2	BA9	BA13

Switching signal modules

- 4DO/2DI module 6DR2801-8E for additional digital inputs and outputs

Module with 2 digital inputs and 4 active digital outputs.

Assignment of functions and the logic is performed using the configuring switches.

The screw-type terminal is supplied with the module.

With the SIPART DR22 and DR24 devices, the digital input on terminal 6 cannot be used.

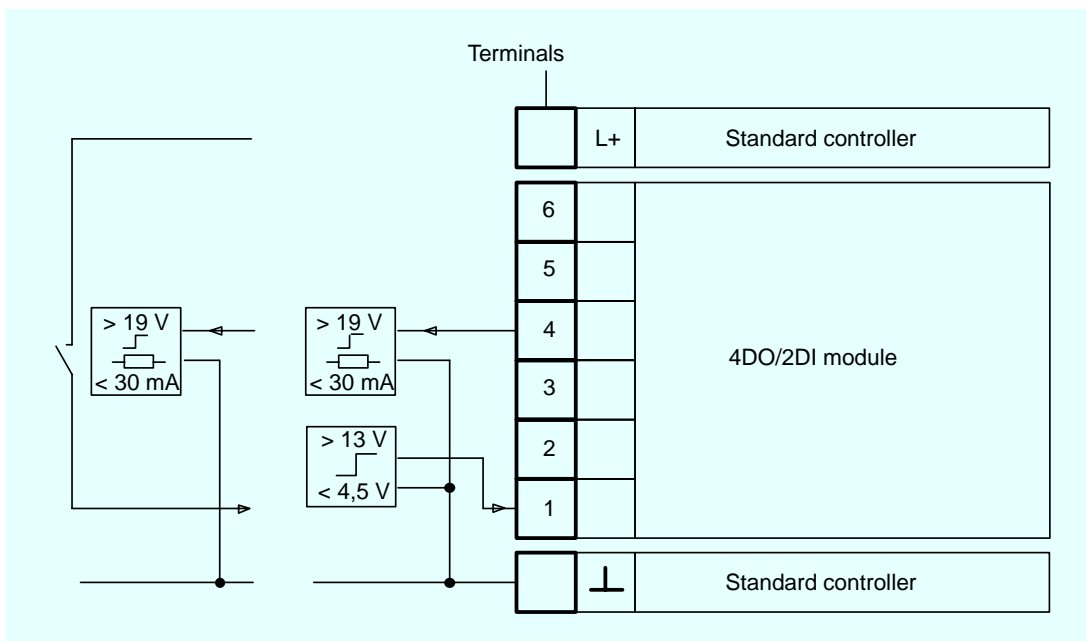| Technical data 6DR2801-8E	
4DO/2DI module	
Signal status "0"	≤ 4.5 V or open
Signal status "1"	≥ 13 V
Input resistance	≥ 27 kΩ
Static destruction limit across inputs	± 35 V
Signal status "0"	≤ 1.5 V
Signal status "1"	19 to 26 V
On-load current	≤ 30 mA
Short-circuit current	≤ 50 mA, pulsed
Static destruction limit across inputs	−1 V or +35 V

Fig. 8/10 Wiring of 4DO/2DI module 6DR2801-8E

Assignment of the terminals to the digital input (DI) and the digital output (DO); depending on device version and slot

Terminal	Digital input, digital output with:			
	SIPART DR19 and DR21	SIPART DR20	SIPART DR22 and DR24	
			Slot 5	Slot 6
6	BE4	–	–	–
5	BA6	+Δy	BA12	BA16
4	BA5	−Δy	BA11	BA15
3	BA4	A2	BA10	BA14
2	BA3	A1	BA9	BA13
1	BE3	BLPS [1])	BE5	BE10

[1]) BLPS = Blocking, parameterization and configuring.

SIPART DR Input/Output Modules

Interface modules

- SES module 6DR2803-8C
  Serial interface module for RS232 and RS485

All process variables, status flags, setpoints, manipulated variables, parameters and configuring switch settings can be transmitted and received via the serial interface module.

Serial data transfer can take place on a point-to-point basis via the RS232 interface; alternatively, the SIPART bus with up to 32 participants can be used, in which case a SIPART bus driver and a power pack are required.

If used in the SIPART DR19 and SIPART DR21 controllers, data can also be transferred across a serial bus using the RS485 interface.

Which method is used (RS232, SIPART bus, RS485) is determined using jumpers on the module.

If the appropriate software is installed on a higher-level system, all controllers in the SIPART family can be connected together in parallel on a bus (e. g. SIMATIC interface).

Should you want to write your own interface software, a detailed technical description of the telegram traffic is provided for each type of controller.

The interface module provides galvanic isolation between the individual controllers and the higher-level system.

See section 9 of the catalog for more information on:

- SIPART bus driver
- Power pack for the bus driver
- Connector/cable
- Software
- SIMATIC interface.

The connector is not supplied with the controller.

The connector and the connector cable must be ordered separately (see page 9/5).

| **Technical data 6DR2803-8C**	
SES module	
Transmittable signals	RS232, SIPART bus or RS485 (RS485 with SIPART DR19 or SIPART DR21 only)
Transmittable data	Status values, process variables, parameters and configuring data
Tpye of transmission	According to DIN 66 258 A or B
Character format	10 bits (start bit, 7 data bits (ASCII format), parity bit and stop bit)
Transmission rate	300 to 9600 bit/s
Transmission	Asynchronous, half-duplex
Addressable stations	32
Watchdog timer for data traffic	1 to 25 s or none
Galvanic isolation	Up to 50 V AC/DC
RS232 point-to-point	
– Line capacity[1]	≤ 2.5 nF
– Line length recommendations	
Unscreened ribbon cable	≤ 50 m
Screened flat cable	≤ 25 m
SIPART bus	with bus driver C73451-A347-B202
– Line capacity[1]	≤ 25 nF
– Line length recommendations	
Unscreened ribbon cable	≤ 500 m
Screened round cable	≤ 250 m
RS485 bus	
– Line capacity[1]	≤ 200 nF
– Line length recommendations	
Unscreened ribbon cable	≤ 1200 m
Screened round cable	≤ 600 m
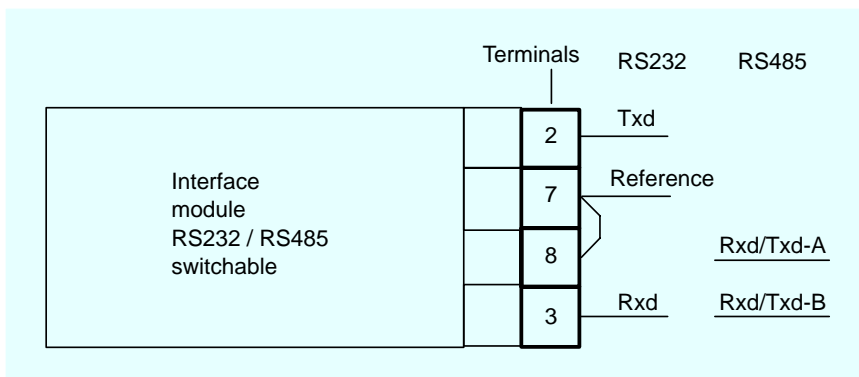
Fig. 8/11 Wiring of the SES module 6DR2803-8C

[1] The cable capacity restricts the permitted line length.

Interface modules

- Module 6DR2803-8P
  PROFIBUS DP interface for SIPART DR

The PROFIBUS DP interface for the SIPART DR controllers is designed as a plug-in option module. It can be used in all previously delivered SIPART DR controllers in the slot provided for the SES interface.

The interface module directly satisfies the PROFIBUS DIN 19 245, Parts 1 and 3 (without additional line driver).

The module has a 9-contact Sub-D socket for connection to the PROFIBUS DP. Standardized PROFIBUS plugs can be used here.

Data transmission is via a twisted RS 485 two-core cable. The power supply to the module is obtained internally direct from the controller.

The firmware of the SIPART DR19/21/22/24 controllers has been extended to the address range 0 to 125 for deliveries from 6/96 onwards. Earlier controllers of these types (address range 0 to 31) can be easily converted.

When connecting the SIPART DR 20 controllers (address range 0 to 31) to the PROFIBUS DP, they must be arranged in the corresponding address range.

The SIPART S5 DP and S7 DP programs (function blocks) are available for connection of the SIPART DR controllers to SIMATIC S5/S7 via the PROFIBUS DP.

| Technical data 6DR2803-8P	
Transmittable signals	RS 485, PROFIBUS DP protocol
Transmittable data	Status flags, process variables, parameters and configuring switches
Transmission procedure PROFIBUS DP protocol	To DIN 19 245 Parts 1 and 3
Certification by the PROFIBUS user organization e.V.	Certificate No.: Z00177 dated 16.09.1996
Transmission rate	9.6 kbits/s to 1.5 Mbits/s
Station No.	0 to 125 (note software version of controller) (0 to 31 with SIPART DR20)
Electrical isolation between RxD/TxD -P/-N and the device	Max. UC 50 V common-mode voltage
Test voltage	AC 500 V
Repeater control signal CNTR-P	5 V −0.4 V/+0.2 V, short-circuit-proof
Cable lengths: per segment at 1.5 Mbits/s	200 m; for further data see ET 200 manual 6ES5 998-3ES12
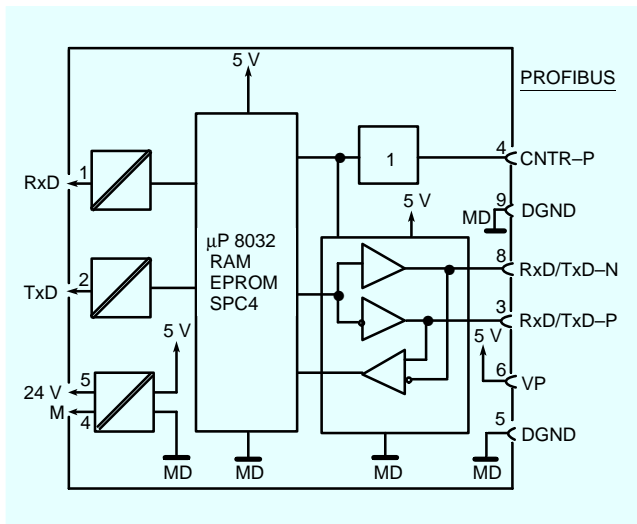
Fig. 8/12 Block diagram

The GSD (basic device data) file is required to connect the SIPART DR controllers to other systems. The type file is required when connecting to a SIMATIC S5/S7 CPU. The DP master interface is parameterized using these data.

When using the coupling software S5/S7 DP, the type file is part of the program and thus not necessary separately.

GSD and the type file can be downloaded free of charge from the mailbox of the Interface Center in Fürth (SSC) Tel.: ++49 (0) 911 73 0983.

The plug and cable must be ordered separately (e.g. from the Siemens catalog IK10, also with integrated terminating resistor).

Brief instructions for the PROFIBUS module in German and English are enclosed with the delivery.

8

SIPART DR Input/Output Modules

Coupling relay module

- 6DR2804-8A coupling relay 230 V, 4 relays
  6DR2804-8B coupling relay 230 V, 2 relays
  for snapping onto the rear of the controller

Note: observe max. switching voltages! (resonance
      magnification on phase shift motors)

The coupling relays can be snapped onto a mounting rail on the
rear of the SIPART DR19, SIPART DR21, SIPART DR22 and
SIPART DR24 controllers.

The mounting rail is supplied with the coupling relay.

The 6DR2804-8A coupling relay contains 4 relays. Two terminal
strips with 9 terminals each are provided for connection
purposes.

Technical data 6DR2804-8A and -8B

2 or 4 coupling relays

|	AC	DC
Relay design	CO contact with spark suppressor	
Contact material	Silver/Cadmium Oxide	
Contact rating[1])	AC	DC
Max. switching voltage	≤ 250 V	≤ 250 V
Max. switching current	≤ 8 A	≤ 8 A
Max. switching capacity	≤ 1250 VA	≤ 100 W at 24 V ≤ 30 W at 250 V
Service life Mechanical	$2 \cdot 10^7$ switching operations	
Electrical 230 V AC, Ω loading	$2 \cdot 10^6$ switching operations	
Spark suppressor	22 nF and 220 Ω connected in series, with 420 V varistor wired in parallel	
Excitation coil[1]) Voltage	+19 to 30 V	
Resistance	1.2 kΩ ± 180 Ω	
Degree of protection EN 60 529 Housing	IP 50	
Terminals inserted	IP 20	
Housing material	Polyamide 66	
Fitting to mounting rail	On NS 35/7.5 to DIN EN 50 022 or NS 35/15 according to DIN EN 50 035 NS 32 according to DIN EN 50 035	
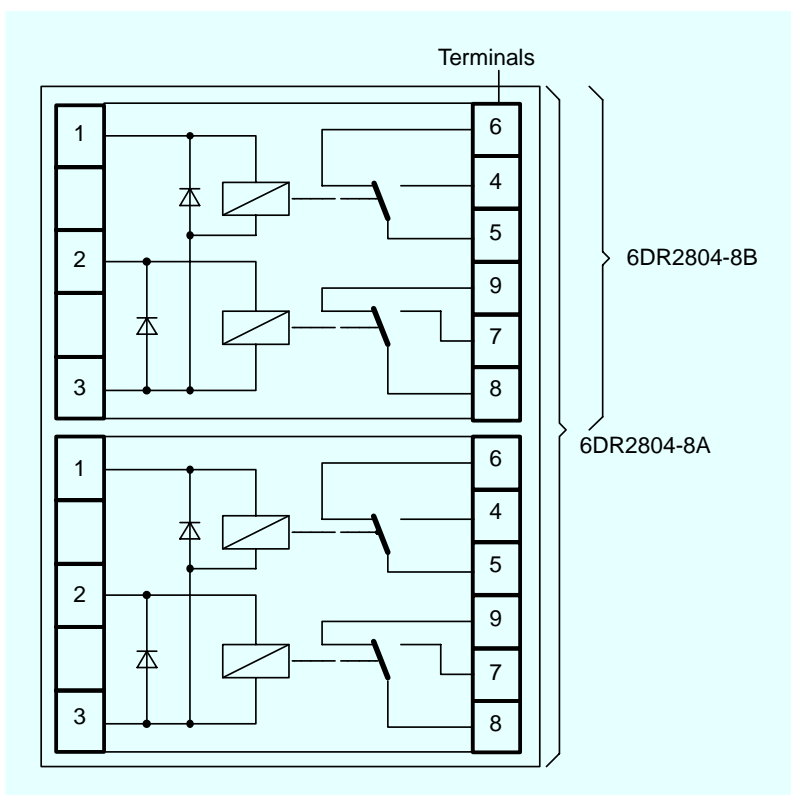
Fig. 8/13 Coupling relay module 6DR2804-8A and 6DR2804-8B

[1]) Excitation coil and contacts safely isolated through the use of reinforced
insulation conforming to DIN/VDE 0106 Part 100 (Nov. 1986).
Ventilation and creepage paths for surge class III and
pollution level 2 according to DIN/VDE 0110 Part 1 January 1989.

Contacts on a relay module safely isolated through the use
of reinforced insulation conforming to DIN/VDE 0106 Part 101 (Nov. 1986).
Ventilation and creepage paths for surge class II and
pollution level 2 according to DIN/VDE 0110 Part 1 January 1989.

Ordering data

Ordering data	
	Order No.
Analog signal modules	
U/I module for current input 0/4 to 20 mA or voltage input 0/0.2 to 1 V or 0/2 to 10 V	**6DR2800-8J**
3 U/I modules with 3 analog inputs 0/4 to 20 mA or 0/0.2 to 1 V or 0/2 to 10 V (SIPART DR24 only)	**6DR2800-8A**
R module for resistance-based sensor	**6DR2800-8R**
Pt 100 module for Pt 100 resistance thermometer	**6DR2800-8P**
TC module for thermocouples or other mv signals	**6DR2800-8T**
UNI module for TC/RTD/R/mV signals, programmable (SIPART DR19/DR21 only)	**6DR2800-8V**
y-hold module (SIPART DR22/DR24 only)	**6DR2802-8A**
Switching signal modules	
5DI module with 5 digital inputs (not with SIPART DR20)	**6DR2801-8C**
2DO relay module with 2 relay outputs	**6DR2801-8D**
4DO/2DI module with 4 digital outputs and 2 digital inputs	**6DR2801-8E**
Interface module	
SES module for serial communication via RS232/RS485 interface	**6DR2803-8C**
PROFIBUS DP module for direct communication via the PROFIBUS DP	**6DR2803-8P**
Coupling relay module	
Coupling relay module with 2 relays (AC 250 V) with 4 relays (AC 250 V)	**6DR2804-8B** **6DR2804-8A**
Reference junction terminal for TC, internal (for use in conjunction with SIPART DR19/AE1 and UNI module)	**6DR2805-8A**
Measuring range connector for I = 20 mA and U = 10 V (for use in conjunction with SIPART DR19/AE1 and UNI module)	**6DR2805-8J**

Available ex-stores:

Items marked ▇ are available ex-stores.