

Signal Conditioning & *Communication Interfaces* *Product Catalog*

PERFORMANCE
MADE
SMARTER



TEMPERATURE | I.S. INTERFACES | COMMUNICATION INTERFACES | MULTIFUNCTIONAL | ISOLATION | DISPLAY

PR
electronics

Our purpose

is to create market-leading site standard solutions with high signal integrity and simplicity for our customers, concentrating on innovation in six core business areas: Temperature, I.S. Interfaces, Communication Interfaces, Multifunctional, Isolation and Display.

Our products are individually outstanding, but when our point-to-point temperature measurement devices, I.S. interfaces, backplanes, multifunctional signal devices and future-proof communication interfaces are combined, our solutions are truly unrivalled.

We will be

our customer's trusted partner for the best and most innovative signal conditioning solutions in the process and factory automation industries.

We provide

a wide range of benefits to our customers through innovative solutions and close collaboration:

- The highest signal integrity from your measurement point to control system
- Maximum uptime based on our Install and Forget® philosophy
- Easy and cost-effective deployment and monitoring with intuitive communication interfaces
- Site standard devices that are easily programmable to suit your specific application
- Day-to-day delivery

Since 1974, we have been dedicated to perfecting our core competence of innovating high precision technology with low power consumption. With a dedicated R&D center that is integrated with our lean production facility at our headquarters in Denmark, we are today one of the leading companies within signal conditioning.



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MULTIFUNCTIONAL TRANSMITTERS



TYPE	3114	4104	4114	4116	4131	
INPUT:	Isolated universal converter	Universal uni-bipolar signal transmitter	Universal transmitter	Universal transmitter	Universal trip amplifier	
RTD, TC, linear resistance, mV, mA, V, potentiometer						
OUTPUT:	mA, V, relays					

INPUT:						
mA, measurement range / min. span	0...23 mA / 16 mA	-23...+23 mA	0...23 mA / 16 mA	0...23 mA / 16 mA	0...23 mA / 16 mA	
V, measurement range / min. span	0...12 VDC / 0.8 V	-12...+12 VDC / 0.8 V	0...12 VDC / 0.8 V	0...12 VDC / 0.8 V	0...12 VDC / 0.8 V	
RTD, measurement range / min. span	-200...+850°C / 25°C	-200...+850°C / -	-200...+850°C / -	-200...+850°C / -	-200...+850°C / -	
Lin. R, measurement range / min. span	0...10000 Ω / -	0...10000 Ω / -	0...10000 Ω / -	0...10000 Ω / -	0...10000 Ω / -	
Potentiometer	10 Ω...100 kΩ	10 Ω...100 kΩ	10 Ω...100 kΩ	10 Ω...100 kΩ	10 Ω...100 kΩ	
Sensor connection, wires	2 - 3 - 4	2 - 3 - 4	2 - 3 - 4	2 - 3 - 4	2 - 3 - 4	
TC types	BEJKNRSTUW3W5Lr	BEJKNRSTUW3W5Lr	BEJKNRSTUW3W5Lr	BEJKNRSTUW3W5Lr	BEJKNRSTUW3W5Lr	
Cold junction compensation	Internal	Internal / external	Internal / external	Internal / external	Internal / external	
Reference voltage / 2-wire supply	- / > 15 V	- / 16 VDC				
OUTPUT:						
mA, signal range / min. span	0...23 mA / 16 mA	-23...+23 mA / 16 mA	0...23 mA / 16 mA	0...23 mA / 16 mA	0...23 mA / 16 mA	
Load (@ current output)	≤ 600 Ω	≤ 800 Ω	≤ 800 Ω	≤ 800 Ω	≤ 800 Ω	
V, signal range / min. span	0...10 VDC / 0.8 VDC	-10...+10 VDC / 0.8 VDC	0...10 VDC / 0.8 VDC	0...10 VDC / 0.8 VDC	0...10 VDC / 0.8 VDC	
Load (@ voltage output)	≥ 10 kΩ	≥ 500 kΩ				
Relays				2 x SPST, AC: 500 VA	2 x SPST, AC: 500 VA	
TECHNICAL SPECIFICATIONS:						
Ambient temperature	-25...+70°C	-20...+60°C	-20...+60°C	-20...+60°C	-20...+60°C	
Supply voltage, universal AC / DC	- / 16.8...31.2 VDC	21.6...253V / 19.2...300V	21.6...253V / 19.2...300V	21.6...253V / 19.2...300V	21.6...253V / 19.2...300V	
Max. required power	1.2 W	2.5 W	2.0 W	2.5 W	2.0 W	
Isolation voltage, test / operation	2.5 kVAC / 250 VAC	2.3 kVAC / 250 VAC	2.3 kVAC / 250 VAC	2.3 kVAC / 250 VAC	2.3 kVAC / 250 VAC	
Response time	0.4 / 1.0 s	< 20 ms	< 400 ms	< 400 ms	< 400 ms	
Signal dynamics, input / output	24 bit / 16 bit	20 bit / 18 bit	24 bit / 16 bit	24 bit / 16 bit	24 bit / -	
Accuracy	< ±0.1% of span	< ±0.05% of span	< ±0.1% of span	< ±0.1% of span	< ±0.1% of span	
Temperature coefficient	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C	
NAMUR	NE 21, NE 43	NE 21	NE 21, NE 43	NE 21, NE 43	NE 21, NE 43	
Channels	1	1	1	1	1	
Programming	4500 series devices	4500 series devices	4500 series devices	4500 series devices	4500 series devices	

APPROVALS:						
ATEX, Zone 2	✓					
IECEx, Zone 2	✓					
FM, Zone 2 - DIV 2	✓	✓	✓	✓	✓	✓
UL 61010 / 508	✓ / -	- / ✓	- / ✓	- / ✓	- / ✓	- / ✓
DNV-GL / EU-RO marine	✓ / -	✓ / -	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓
EAC	✓	✓	✓	✓	✓	✓
SIL 2, Hardware Assessment			✓	✓		

APPLICATION GUIDE:						
mA / V / temperature input	✓ / ✓ / ✓	✓ / ✓ / -	✓ / ✓ / ✓	✓ / ✓ / ✓	✓ / ✓ / ✓	
Bipolar mA / V input		✓ / ✓				
Lin. R / potentiometer input	✓ / ✓		✓ / ✓	✓ / ✓	✓ / ✓	
4...20 mA Tx input	✓	✓	✓	✓	✓	
V-curve function		✓				
Buffered voltage output	✓					
Active / passive current output	✓ / -	✓ / ✓	✓ / -	✓ / -		
Analog / relay output	✓ / -	✓ / -	✓ / -	✓ / ✓	- / ✓	
Custom sensor linearization						
Process signal calibration	✓	✓	✓	✓	✓	
Power rail option	✓					



TYPE

4179

4184

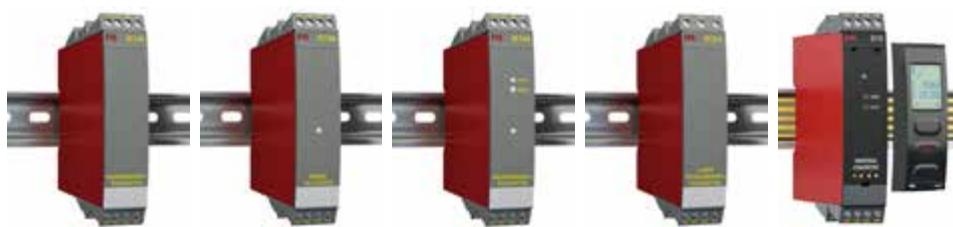
INPUT: mV, mA, A, V, potentiometer	Universal AC/DC transmitter	Universal uni-/bipolar signal transmitter				
OUTPUT: mA, V						

INPUT:						
mA, measurement range / min. span		±100 mA / 0.5 mA				
A, measurement range / min. span	0...5 AAC / 0.5 AAC					
V, measurement range / min. span	0...300 VAC / 0.5 VAC	±300 VDC / 25 mV				
RTD, measurement range / min. span						
Lin. R, measurement range / min. span						
Potentiometer		0..100 %				
Reference voltage / 2-wire supply		2.5 V / 16 V				
3-wire supply		> 18...< 28 V				
OUTPUT:						
mA, signal range / min. span	-23...+23 mA / 16 mA	±23 mA / 4 mA				
Load (@ current output)	≤ 800 Ω	≤ 1000 Ω				
V, signal range / min. span	-10...+10 VDC / 0.8 VDC	-10...+10 VDC / 0.8 VDC				
Load (@ voltage output)	≥ 500 kΩ	≥ 500 kΩ				
Buffered voltage output		± 23 V				
TECHNICAL SPECIFICATIONS:						
Ambient temperature	-20...+60°C	-20...+60°C				
Supply voltage, universal AC / DC	21.6...253V / 19.2...300V	21.6...253V / 19.2...300V				
Max. required power	1.8 W	2.5 W				
Isolation voltage, test / operation	2.3 kVAC / 250 VAC	2.3 kVAC / 250 VAC				
Response time	< 0.75 s	< 20 ms				
Signal dynamics, input / output	20 bit / 18 bit	24 bit / 18 bit				
Accuracy	< ±0.3% of span	< ±0.05% of span				
Temperature coefficient	< ±0.01% of span / °C	< ±0.01% of span / °C				
NAMUR	NE 21, NE 43	NE 21, NE 43				
Channels	1	1				
Programming	4500 series devices	4500 series devices				

APPROVALS:						
ATEX, Zone 2						
IECEx, Zone 2						
FM, Zone 2 - DIV 2						
UL 61010 / 508	- / ✓	- / ✓				
DNV-GL						
EAC						
SIL 2, Hardware Assessment	✓	✓				

APPLICATION GUIDE:						
mA / V / temperature input	✓ / ✓ / -	✓ / ✓ / -				
Bipolar mA / V input		✓ / ✓				
Lin. R / potentiometer input		- / ✓				
4...20 mA Tx input		✓				
V-curve function	✓	✓				
Buffered voltage output		✓				
Active / passive current output	✓ / ✓	✓ / ✓				
Analog / relay output	✓ / -	✓ / -				
Custom sensor linearization						
Process signal calibration	✓	✓				
Power rail option						

MULTIFUNCTIONAL TRANSMITTERS



TYPE	5114A	5115A	5116A	5131A	9116A	
linear resistance, V, potentiometer	Programmable transmitter	Signal calculator	Programmable transmitter w. limit switch	2-wire programmable transmitter	Universal converter	
delays						
ment range / min. span	0...100 mA / 4 mA	0...100 mA / 4 mA	0...100 mA / 4 mA	0...100 mA / 4 mA	0...23 mA / 16 mA	
ment range / min. span	0...250 VDC / 5 mV	0...250 VDC / 5 mV	0...250 VDC / 5 mV	0...250 VDC / 5 mV	0...12 VDC / 0.8 V	
ment range / min. span	-150...+150 mV / 5 mV	-150...+150 mV / 5 mV	-2500...+2500 mV/5 mV	-150...+150 mV / 5 mV		
ment range / min. span	-200...+850°C / 25°C	-200...+850°C / 25°C	-200...+850°C / 25°C	-200...+850°C / 25°C	-200...+850°C / 25°C	
ment range / min. span	0...5000 Ω / 30 Ω	0...5000 Ω / 30 Ω	0...5000 Ω / 30 Ω	0...5000 Ω / 30 Ω	0...10000 Ω / -	
er	200 Ω...100 kΩ	200 Ω...100 kΩ	200 Ω...100 kΩ		10 Ω...10000 Ω	
ction, wires	2 - 3 - 4	2 - 3 - 4	2 - 3 - 4	2 - 3 - 4	2 - 3 - 4	
	BE KLNRSUW3W5Lr	BE KLNRSUW3W5Lr	BE KLNRSUW3W5Lr	BE KLNRSUW3W5Lr	BE KLNRSUW3W5Lr	
50% of selec. max. value	50% of selec. max. value	50% of selec. max. value	50% of selec. max. value	50% of selec. max. value		
compensation	Internal / external	Internal / external	Internal / external	Internal / external	Internal / external	
stage / 2-wire supply	2.5 VDC / > 17.1 VDC	2.5 VDC / > 17.1 VDC	2.5 VDC / > 16.5 VDC		- / > 16.5 VDC	
age / min. span	0...23 mA / 10 mA	0...23 mA / 10 mA	0...23 mA / 10 mA	3.5...23 mA / 10 mA	0...23 mA / 16 mA	
nt output)	≤ 600 Ω	≤ 600 Ω	≤ 600 Ω	≤ (V _{supply} -7.5)/0.023 [Ω]	≤ 600 Ω	
age / min. span	0...10 VDC / 0.5 VDC	0...10 VDC / 0.5 VDC	0...10 VDC / 0.5 VDC			
age output)	≥ 500 kΩ	≥ 500 kΩ	≥ 500 kΩ			
			2 x SPST, AC: 500 VA		1 x SPST, AC: 500 VA	
E CIFICATIONS:						
perature	-20...+60°C	-20...+60°C	-20...+60°C	-20...+60°C	-20...+60°C	
e, universal AC / DC	21.6...253 V / 19.2...300 V	21.6...253 V / 19.2...300 V	21.6...253 V / 19.2...300 V	- / 7.5...35 VDC	- / 19.2...31.2 VDC	
power, 1 / 2 channels	2.1 W / 2.8 W	2.1 W / 2.8 W	2.4 W / -	0.8 W	≤ 2.1 W	
age, test / operation	3.75 kVAC / 250 VAC	3.75 kVAC / 250 VAC	3.75 kVAC / 250 VAC	3.75 kVAC / 250 VAC	2.6 kVAC / 250 VAC	
e	250 ms...60 s	250 ms...60 s	250 ms...60 s	1...60 s	0.4 / 1...60 s	
cs, input / output	22 bit / 16 bit	22 bit / 16 bit	22 bit / 16 bit	22 bit / 16 bit	24 bit / 16 bit	
coefficient	< ±0.05% of span	< ±0.05% of span	< ±0.05% of span	< ±0.05% of span	< ±0.1% of span	
	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C	
	NE 21, NE 43	NE 21, NE 43	NE 21, NE 43	NE 21, NE 43	NE 21, NE 43	
1 or 2	2		1	1 or 2	1	
5909 + DIP switch	5909 + DIP switch	5909	5909	5909 + DIP switch	4500 series devices	

APPROVALS

APPLICATION GUIDE:

mA / V / temperature input	✓ / ✓ / ✓	✓ / ✓ / ✓	✓ / ✓ / ✓	✓ / ✓ / ✓	✓ / ✓ / ✓	
Bipolar mV input	✓	✓	✓	✓		
Lin. R / potentiometer input	✓ / ✓	✓ / ✓	✓ / ✓	✓ / -	✓ / ✓	
4...20 mA Tx input	✓	✓	✓	✓	✓	
Dual input - math functions		✓				
Buffered voltage output						
Active / passive current output	✓ / ✓	✓ / ✓	✓ / ✓	✓	✓ / ✓	
Analog / relay output	✓ / -	✓ / -	✓ / ✓	✓ / -	✓ / ✓	
Custom sensor linearization	✓	✓	✓			
Process signal calibration	✓	✓	✓	✓	✓	
Power rail option						✓

FREQUENCY / PULSE



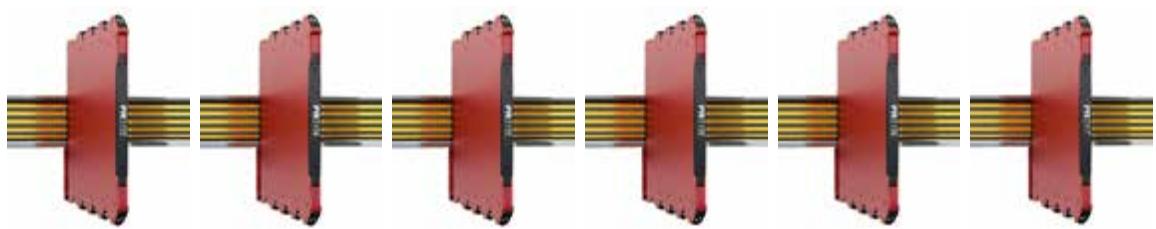
TYPE	4222	5202A	5223A	5225A	9202A
INPUT: Frequency, pulse, V, mA, Pt100, TC, mV	Universal I/f converter	Pulse isolator	Programmable f/I - f/f converter	Programmable f/I - f/f converter	Pulse isolator
OUTPUT: mA, V, pulse, relays					

INPUT:		NAMUR / switch	All standard sensors	All standard sensors	NAMUR / switch
Sensor type					
Hz, measurement range / min. span	0...5 kHz	0...20 kHz / 0.001 Hz	0...20 kHz / 0.001 Hz	0...20 kHz / 0.001 Hz	0...5 kHz
Min. pulse width	> 100 µs	25 µs	25 µs	25 µs	> 100 µs
mA, measurement range / min. span	0...23 mA / 16 mA				
V, measurement range / min. span	0...12 VDC				
RTD, measurement range / min. span	200...+850°C / -				
Lin. R, measurement range / pot.-meter	0 Ω...10 kΩ / 10 Ω...100 kΩ				
Sensor connection, wires	2 - 3 - 4				
TC types	BEJKLNRSTUW3W5Lr				
OUTPUT:					
mA, signal range / min. span		0...23 mA / 5 mA	0...23 mA / 5 mA		
V, signal range / min. span		0...10 VDC / 0.25 VDC	0...10 VDC / 0.25 VDC		
Hz, signal range / min. span	0...25000 Hz / 0.001 Hz	0...5 kHz / -			0...5 kHz
Pulse output	NPN / PNP / TTL	NPN / relay	NPN / PNP or relays	NPN / PNP or relays	NPN / relay
Relays		2 x SPDT, AC: 100 VA	2 x SPST, AC: 500 VA	2 x SPST, AC: 500 VA	1 x SPST, AC: 500 VA
Max. output frequency	25 kHz		1000 Hz	1000 Hz	
Sensor supply	> 16 VDC		5...17 VDC	5...17 VDC	
TECHNICAL SPECIFICATIONS:					
Ambient temperature	-20...+60°C	-20...+60°C	-20...+60°C	-20...+60°C	-20...+60°C
Supply voltage, AC / DC	21.6...253V / 19.2...300V	21.6...253V / 19.2...300V	21.6...253V / 19.2...300V	< 19.2...28.8 VDC	< 19.2...31.2 VDC
Max. required power, 1 / 2 channels	2.5 W / -	- / 1.5 W or 1.8 W*	3 W	3.5 W	≤ 1.1...1.3 W / ≤ 1.5...1.9 W
Isolation voltage, test / operation	2.3 kVAC / 250 VAC	3.75 kVAC / 250 VAC	3.75 kVAC / 250 VAC	3.75 kVAC / 250 VAC	2.6 kVAC / 250 VAC
Response time	< 1 s		60 ms...1000 s	60 ms...1000 s	200 ms
Signal dynamics, input / output	24 bit / -		- / 16 bit	- / 16 bit	
Accuracy	≤ ±0.1% of span		≤ ±0.1% of span	≤ ±0.1% of span	
Temperature coefficient	≤ ±0.01% of span / °C		≤ ±0.01% of span / °C	≤ ±0.01% of span / °C	
NAMUR	NE 21	NE 21			NE 21
Channels	1	2	1	1	1 or 2
Programming	4500 series devices	DIP switch	5909 + DIP switch	5909 + DIP switch	4500 series devices

APPROVALS:					
ATEX, Zone 2					✓
IECEx, Zone 2					
FM, Zone 2 - DIV 2	✓				
UL 61010 / 508	- / ✓	- / ✓			✓ / -
DNV-GL					✓
EAC	✓	✓	✓	✓	✓
SIL 2, Hardware Assessment		✓			
SIL 2 Full Assessment IEC 61508					✓

APPLICATION GUIDE:					
Frequency to analog converter			✓	✓	
Analog to frequency converter	✓				
Lin. R / potentiometer input	✓ / ✓				
Concurrent f/I and f/f				✓	
Pulse converter / scaler			✓	✓	
Pulse isolator 1:1					✓
Dual input - math functions		✓	✓		
Digital output	✓		✓	✓	✓
Relay output		✓	✓	✓	✓
Process signal calibration	✓	✓	✓	✓	
Power rail option					✓

ISOLATORS



TYPE	3103	3104	3105	3108	3109	3117
INPUT: mA, V, potentiometer	Isolated repeater	Isolated converter	Isolated converter	Isolated repeater / splitter	Isolated converter / splitter	Bipolar isolated converter
OUTPUT: mA, V						
INPUT: mA, measurement range / min. span V, measurement range / min. span Reference voltage / 2-wire supply	0...23 mA / 1:1 0...10.25 VDC / 4 VDC - / > 17 V	0...23 mA / 16 mA 0...10.25 VDC / 4 VDC	0...23 mA / 16 mA 0...10.25 VDC / 4 VDC	0...23 mA / 1:1 0...10.25 VDC / 4 VDC	0...23 mA / 16 mA 0...10.25 VDC / 4 VDC - / > 17 V	-23...+23 mA ±5 and ±10 VDC
OUTPUT: mA, signal range / min. span Load (@ current output) V, signal range / min. span Load (@ voltage output)	0...23 mA / 1:1 ≤ 600 Ω 0...10 VDC / 4 VDC ≥ 10 kΩ	0...23 mA / 16 mA ≤ 600 Ω 0...10 VDC / 4 VDC	0...23 mA / 16 mA ≤ 600 Ω 0...10 VDC / 4 VDC	0...23 mA / 1:1 ≤ 300 Ω per channel 0...10 VDC / 4 VDC ≥ 10 kΩ	0...23 mA / 16 mA ≤ 300 Ω per channel 0...10 VDC / 4 VDC ≥ 10 kΩ	0...23 mA / 16 mA ≤ 600 Ω 0...10 VDC / 4 VDC ≥ 10 kΩ
TECHNICAL SPECIFICATIONS:						
Ambient temperature	-25...+70°C	-25...+70°C	0...+70°C	-25...+70°C	-25...+70°C	-25...+70°C
Supply voltage, AC / DC	- / 16.8...31.2 VDC	- / 16.8...31.2 VDC	- / 16.8...31.2 VDC	- / 16.8...31.2 VDC	- / 16.8...31.2 VDC	- / 16.8...31.2 VDC
Max. required power*	0.65 W	1.2 W	0.8 W	0.75 W	1.2 W	0.8 W
Isolation voltage, test / operation	2.5 KVAC / 250 VAC	2.5 KVAC / 250 VAC	2.5 KVAC / 250 VAC	2.5 KVAC / 250 VAC	2.5 KVAC / 250 VAC	2.5 KVAC / 250 VAC
Response time	< 7 ms	< 7 ms	< 7 ms	< 7 ms	< 7 ms	< 7 ms
Signal dynamics, input / output	Analog signal chain	Analog signal chain	Analog signal chain	Analog signal chain	Analog signal chain	Analog signal chain
Accuracy	< ±0.05% of span	< ±0.05% of span	< ±0.2% of span	< ±0.05% of span	< ±0.05% of span	< ±0.05% of span
Temperature coefficient	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.015% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C
NAMUR	NE 21	NE 21	NE 21	NE 21	NE 21	NE 21
Channels	1	1	1	1	1	1
Programming	No	DIP switch	DIP switch	No	DIP switch	DIP switch
APPROVALS:						
ATEX, Zone 2	✓	✓		✓	✓	✓
IECEx, Zone 2	✓	✓		✓	✓	✓
FM, Zone 2 - DIV 2	✓	✓		✓	✓	✓
UL 61010 / 508	✓ / -	✓ / -	✓ / -	✓ / -	✓ / -	✓ / -
DNV-GL	✓	✓	✓	✓	✓	✓
EAC	✓	✓	✓	✓	✓	✓

APPLICATION GUIDE:

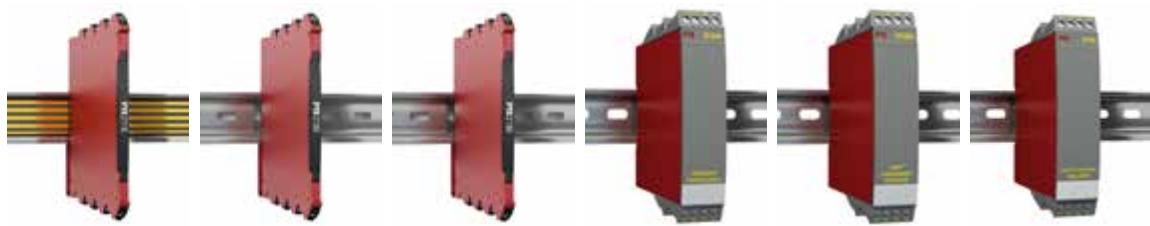
Signal repeater	✓			✓		
Signal converter		✓	✓		✓	✓
Signal splitter				✓	✓	
mA / V bipolar input						✓
4...20 mA Tx input		✓			✓	
Buffered voltage output		✓	✓		✓	✓
mA / V output	✓ / -	✓ / ✓	✓ / ✓	✓ / -	✓ / ✓	✓ / ✓
Active / passive mA output	✓ / -	✓ / -	✓ / -	✓ / -	✓ / -	✓ / -
Mounting in Zone 2 / Div 2	✓	✓	✓	✓	✓	✓
Power rail option	✓	✓	✓	✓	✓	✓

* = @ 24 VDC

Of span = Of the presently selected range

ISOLATORS

HART
COMMUNICATION FOUNDATION



TYPE	3118	3185	3186	5104A	5106A	6185
INPUT: mA, mV, V, HART communication	Bipolar isolated converter / splitter	Loop-powered isolator	2-wire transmitter isolator	Repeater / power supply	HART transparent repeater	Loop-powered isolator
OUTPUT: mA, V, HART communication						
INPUT:						
mA, measurement range / min. span	-23...+23 mA	0...23 mA / 1:1	3.5...23 mA / 1:1	0...23 mA / 16 mA	3.5...23 mA / 1:1	0...23 mA / 1:1
V, measurement range / min. span	±5 and ±10 VDC			0...10 VDC / 8 VDC		
Max. offset				20% of selec. max. value		
Reference voltage / 2-wire supply			- / V _{loop} -2.5 VDC	- / > 17.1 VDC	- / > 17 VDC	
OUTPUT:						
mA, signal range / min. span	0...23 mA / 16 mA	0...23 mA / 1:1	3.5...23 mA / 1:1	0...23 mA / 16 mA	3.5...23 mA / 1:1	0...23 mA / 1:1
Load (@ current output)	≤ 300 Ω per channel	≤ 600 Ω		≤ 600 Ω	≤ 600 Ω	≤ 600 Ω
V, signal range / min. span	0...10 VDC / 4 VDC			0...10 VDC / 0.8 VDC		
Load (@ voltage output)	≥ 10 kΩ			≥ 500 kΩ		
Max. offset				20% of selec. max. value		
TECHNICAL SPECIFICATIONS:						
Ambient temperature	-25...+70°C	-25...+70°C	-25...+70°C	-20...+60°C	-20...+60°C	-20...+60°C
Supply voltage, AC / DC	- / 16.8...31.2 VDC	≤ 1.25 V + (0.015 x V _{out})	- / 6...35 VDC	21.6...253 V / 19.2...300 V	21.6...253 V / 19.2...300 V	- / ≤ 1.8 VDC
Max. required power, 1 / 2 channels	*0.8 W / -	30 mW per channel	50 mW per channel	2.0 W / 2.8 W	2.0 W / 2.8 W	40 mW per channel
Isolation voltage, test / operation	2.5 kVAC / 250 VAC	2.5 kVAC / 250 VAC	2.5 kVAC / 250 VAC	3.75 kVAC / 250 VAC	3.75 kVAC / 250 VAC	2 kVAC / -
Response time	< 7 ms	< 5 ms	< 5 ms	< 25 ms	< 25 ms	< 4 ms
Signal dynamics, input / output	Analog signal chain	Analog signal chain	Analog signal chain	Analog signal chain	Analog signal chain	Analog signal chain
Accuracy	< ±0.05% of span	< ±0.1% of span	< ±0.05% of span	< ±0.1% of span	< ±0.1% of span	< ±0.1% of span
Temperature coefficient	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C
NAMUR	NE 21	NE 21	NE 21	NE 21	NE 21	
Channels	1	1 or 2	1 or 2	1 or 2	1 or 2	1, 2 or 4
Programming	DIP switch	No	No	DIP switch	DIP switch	No
APPROVALS:						
ATEX, Zone 2	✓	✓	✓			
IECEx, Zone 2	✓	✓	✓			
FM, Zone 2 - DIV 2	✓	✓	✓			
UL 61010 / 508	✓ / -	✓ / -	✓ / -	- / ✓	- / ✓	
DNV-GL	✓	✓	✓	✓		
EAC	✓	✓	✓	✓	✓	✓
APPLICATION GUIDE:						
Signal repeater		✓	✓		✓	✓
Signal converter	✓			✓		
Signal splitter	✓					
mA / V bipolar input	✓ / ✓					
4...20 mA Tx input			✓	✓	✓	
Buffered voltage output	✓					
Active / passive input signal		✓ / -	✓ / ✓			✓ / -
mA / V output	✓ / ✓	✓ / -	✓ / -	✓ / ✓	✓ / -	✓ / -
Active / passive mA output	✓ / -	✓ / -	- / ✓	✓ / ✓	✓ / ✓	✓ / -
Mounting in Zone 2 / Div 2	✓	✓	✓			
Power rail option	✓					

* = @ 24 VDC

Of span = Of the presently selected range

ISOLATORS



TYPE	9106A	9107A	9203A			
INPUT: mA, HART communication	HART transparent repeater	HART transparent driver	Solenoid / alarm driver			
OUTPUT: mA, HART communication						
INPUT:						
mA, measurement range / min. span	3.5...23 mA / 16 mA	3.5 ...23 mA / 16 mA				
V, measurement range / min. span						
Max. offset						
Reference voltage / 2-wire supply	- / > 16 VDC					
Sensor type			NPN / PNP / switch			
OUTPUT:						
mA, signal range / min. span	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA				
Pulse output			Valves etc.			
TECHNICAL SPECIFICATIONS:						
Ambient temperature	-20...+60°C	-20...+60°C	-20...+60°C			
Supply voltage, AC / DC	- / 19.2...31.2 VDC	19.2...31.2 VDC	19.2...31.2 VDC			
Max. required power, 1 / 2 channels	≤ 1.1 W / ≤ 1.9 W	≤ 1.0 W / ≤ 1.8 W	≤ 1.9...2.5 W / ≤ 3.1 W			
Isolation voltage, test / operation	2.6 kVAC / 250 VAC	2.6 kVAC / 250 VAC	2.6 kVAC / 250 VAC			
Response time	< 5 ms	< 5 ms	< 10 ms			
Signal dynamics,input	Analog signal chain	Analog signal chain				
Accuracy	≤ ±16 µA	≤ ±16 µA				
Temperature coefficient	≤ ±1.6 µA / °C	≤ ±0.01% of span / °C				
NAMUR	NE 21	NE 21	NE 21			
Channels	1 or 2	1 or 2	1 or 2			
Programming	4500 series devices	4500 series devices	4500 series devices			
APPROVALS:						
ATEX, Zone 2	✓	✓	✓			
IECEx, Zone 2						
FM, Zone 2 - DIV 2						
UL 61010 / 508	✓ / -	✓ / -	✓ / -			
DNV-GL	✓	✓	✓			
EAC	✓	✓	✓			
SIL 2/3 Full Assessment IEC 61508	✓	✓	✓			

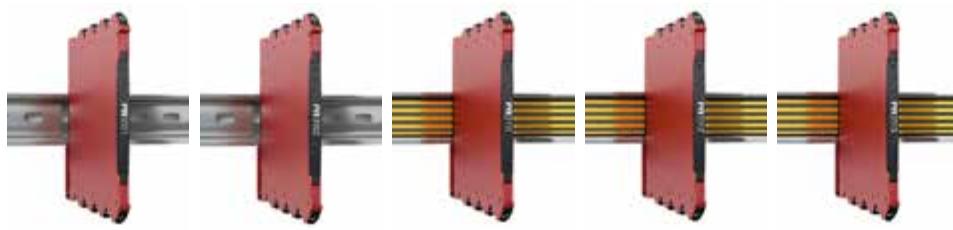
APPLICATION GUIDE:						
Signal repeater	✓					
Signal driver		✓				
Signal splitter	✓					
Solenoid / alarm driver			✓			
mA input	✓	✓				
4...20 mA Tx input	✓					
Active / passive mA output	✓ / ✓	✓ / -				
HART signal transparent	✓	✓				
Mounting in Zone 2 / Div 2	✓	✓	✓			
Power rail option	✓	✓	✓			



= Full assessment acc. to IEC 61508

TEMPERATURE TRANSMITTERS

HART
COMMUNICATION FOUNDATION



TYPE	3101	3102	3111	3112	3113
INPUT: RTD, linear resistance, TC, mV, mA, potentiometer	TC converter	Pt100 converter	TC converter - isolated	Pt100 converter - isolated	HART 7 temperature converter
OUTPUT: mA, HART communication					

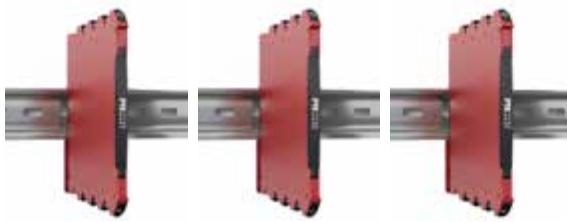
INPUT:				
RTD, measurement range / min. span		-200...+850°C / 10°C		-200...+850°C / 10°C
Lin. R, measurement range / min. span				
Sensor connection, wires	2 - 3 - 4		2 - 3 - 4	2 - 3 - 4
TC types	J & K		J & K	J & K
Max. offset				
Cold junction compensation	Internal		Internal / external	Internal / external
OUTPUT:				
mA, signal range / min. span	0...23 mA / 16 mA			
Load (@ current output)	≤ 600 Ω	≤ 600 Ω	≤ 600 Ω	≤ 600 Ω
V, signal range / min. span	0...10 VDC / 4 VDC			
Load (@ voltage output)	≥ 10 kΩ	≥ 10 kΩ	≥ 10 kΩ	≥ 10 kΩ
TECHNICAL SPECIFICATIONS:				
Ambient temperature	-25...70°C	-25...70°C	-25...70°C	-25...70°C
Supply voltage, DC	16.8...31.2 VDC	16.8...31.2 VDC	16.8...31.2 VDC	16.8...31.2 VDC
Max. required power*	0.52 W	0.52 W	0.7 W	0.7 W
Isolation voltage, test / operation			2.5 kVAC / 250 VAC	2.5 kVAC / 250 VAC
Response time	< 30 ms	< 30 ms	< 30 ms	< 30 ms
Signal dynamics, input / output	23 bit / 18 bit			
Accuracy	≤ ±0.1% of span	≤ ±0.1% of span	≤ ±0.05% of span	≤ ±0.05% of span
Temperature coefficient	≤ ±0.01% of span / °C			
NAMUR	NE 21, NE 43			
Channels	1	1	1	1
Programming	DIP switch	DIP switch	DIP switch	DIP switch / HART

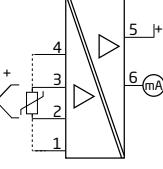
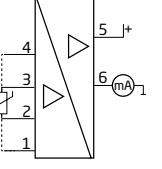
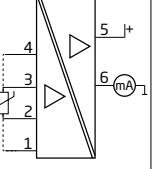
APPROVALS:				
ATEX, Zone 2	✓	✓	✓	✓
IECEx, Zone 2	✓	✓	✓	✓
FM, Zone 2 - DIV 2	✓	✓	✓	✓
UL 61010 / 508	✓ / -	✓ / -	✓ / -	✓ / -
DNV-GL	✓	✓	✓	✓
EAC	✓	✓	✓	✓

APPLICATION GUIDE:				
RTD / TC / mV input	- / ✓ / -	✓ / - / -	- / ✓ / -	✓ / - / -
mA / V output	✓ / ✓	✓ / ✓	✓ / ✓	✓ / -
Loop-powered				
Galvanically isolated			✓	✓
HART protocol				✓
Mounting in Zone 2 / DIV 2	✓ / ✓	✓ / ✓	✓ / ✓	✓ / ✓
Process signal calibration				✓
Power rail option			✓	✓

TEMPERATURE TRANSMITTERS

HART COMMUNICATION FOUNDATION



TYPE	3331	3333	3337			
INPUT: RTD, linear resistance, TC, mV	Temperature converter, loop- powered - isolated	Pt100 converter, loop- powered	HART 7 temperature converter, loop- powered			
OUTPUT: mA, V, HART communication						
INPUT: RTD, measurement range / min. span	-200...+850°C / 10°C	-200...+850°C / 10°C	-200...+850°C / 10°C			
Lin. R, measurement range / min. span						
Sensor connection, wires	2 - 3 - 4	2 - 3 - 4	2 - 3 - 4			
TC types	J & K		J & K			
Max. offset						
Cold junction compensation	Internal / external		Internal / external			
OUTPUT: mA, signal range / min. span	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA			
Load (@ current output)	≤ (V _{supply} -5.5)/0.023 [Ω]	≤ (V _{supply} -3.3)/0.023 [Ω]	≤ (V _{supply} -6.2)/0.023 [Ω]			
TECHNICAL SPECIFICATIONS:						
Ambient temperature	-25...70°C	-25...70°C	-25...70°C			
Supply voltage, DC	5.5...35 VDC	3.3...35 VDC	6.2...35 VDC			
Max. required power	0.8 W	0.8 W	0.8 W			
Isolation voltage, test / operation	2.5 kVAC / 250 VAC		2.5 kVAC / 250 VAC			
Response time	< 30 ms	< 30 ms	< 60 ms			
Signal dynamics, input / output	23 bit / 18 bit	23 bit / 18 bit	23 bit / 18 bit			
Accuracy	≤ ±0.05% of span	≤ ±0.1% of span	≤ ±0.05% of span			
Temperature coefficient	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C			
NAMUR	NE 21, NE 43	NE 21, NE 43	NE 21, NE 43			
Channels	1	1	1			
Programming	DIP switch	DIP switch	DIP switch / HART			
APPROVALS:						
ATEX, Zone 2	✓	✓	✓			
IECEx, Zone 2	✓	✓	✓			
FM, Zone 2 - DIV 2	✓	✓	✓			
UL 61010 / 508	✓ / -	✓ / -	✓ / -			
DNV-GL	✓	✓	✓			
EAC	✓	✓	✓			

TEMPERATURE TRANSMITTERS



TYPE	5331A	5332A	5333A	5334A	5335A	5337A
INPUT: RTD, linear resistance, TC, mV, potentiometer	2-wire programmable transmitter	2-wire programmable RTD transmitter	2-wire programmable transmitter	2-wire programmable transmitter	2-wire transmitter with HART 5 protocol	2-wire transmitter with HART 7 protocol
OUTPUT: mA, HART communication						

INPUT:						
mV, measurement range / min. span	-12...800 mV / 5 mV			-12...150 mV / 5 mV	-800...+800 mV / 2.5 mV	-800...+800 mV / 2.5 mV
RTD, measurement range / min. span	-200...+850°C / 25°C	-200...+850°C / 25°C	-200...+850°C / 25°C		-200...+850°C / 10°C	-200...+850°C / 10°C
Lin. R, measurement range / min. span	0...5000 Ω / 30 Ω	0...5000 Ω / 30 Ω	0...10 kΩ / 30 Ω		0...7000 Ω / 25 Ω	0...7000 Ω / 25 Ω
Potentiometer						
Sensor connection, wires	2 - 3 - 4	2 - 3 - 4	2 - 3		2 - 3 - 4	2 - 3 - 4
TC types	BEJ KLN RSTUW3 W5 Lr			BEJ KLN RSTUW3 W5 Lr	BEJ KLN RSTUW3 W5	BEJ KLN RSTUW3 W5
Max. offset	50% of selec. max. value					
Cold junction compensation	Internal / external			Internal	Internal / external	Internal / external
OUTPUT:						
mA, signal range / min. span	3.5...23 mA / 16 mA					
TECHNICAL SPECIFICATIONS:						
Ambient temperature	-40...+85°C	-40...+85°C	-40...+85°C	-40...+85°C	-40...+85°C	-40...+85°C
Supply voltage, DC	7.2...35 VDC	7.2...35 VDC	8...35 VDC	7.2...35 VDC	8...35 VDC	8...35 VDC
Max. required power	0.8 W					
Isolation voltage, test / operation	1500 VAC / 50 V			1500 VAC / 50 V	1500 VAC / 50 V	1500 VAC / 50 V
Response time	1...60 s	1...60 s	0.33...60 s	1...60 s	1...60 s	1...60 s
Signal dynamics, input / output	20 bit / 16 bit	20 bit / 16 bit	19 bit / 16 bit	18 bit / 16 bit	22 bit / 16 bit	22 bit / 16 bit
Accuracy	≤ ±0.05% of span	≤ ±0.05% of span	≤ ±0.1% of span	≤ ±0.05% of span	≤ ±0.05% of span	≤ ±0.05% of span
Temperature coefficient	< ±0.01% of span / °C	< ±0.005% of span / °C	< ±0.005% of span / °C			
NAMUR	NE 21, NE 43	NE 43	NE 43	NE 21, NE 43	NE 21, NE 43, NE89	NE 21, NE 43, NE89
Channels	1	1	1	1	1	1
Programming	5909	5909	5909	5909	5909/HART 5	5909/HART 7/HART 5

APPROVALS:						
ATEX, Zone 2	✓	✓	✓	✓	✓	✓
IECEx, Zone 2	✓	✓	✓	✓	✓	✓
CSA, Zone 2 - DIV 2						
FM, Zone 2 - DIV 2						
INMETRO	✓		✓	✓	✓	✓
NEPSI						
DNV-GL	✓		✓	✓	✓	✓
EAC	✓		✓	✓	✓	✓
SIL 2, Hardware Assessment					✓	✓

APPLICATION GUIDE:						
RTD / TC / mV input	✓ / ✓ / ✓	✓ / - / -	✓ / - / -	- / ✓ / ✓	✓ / ✓ / ✓	✓ / ✓ / ✓
Lin. R / potentiometer input	✓ / -	✓ / -	✓ / -		✓ / -	✓ / -
Dual input (4 terminals)					✓	✓
Custom sensor linearization	✓	✓	✓	✓	✓	✓
mA output	✓	✓	✓	✓	✓	✓
Loop-powered	✓	✓	✓	✓	✓	✓
Galvanically isolated	✓			✓	✓	✓
HART protocol					✓	✓
Mounting in Zone 2 / DIV 2	✓ / -	✓ / -	✓ / -	✓ / -	✓ / -	✓ / -
Process signal calibration	✓	✓	✓	✓	✓	✓

TEMPERATURE TRANSMITTERS



TYPE	5343A	5350A	5437A			
INPUT:	2-wire level transmitter	Profibus PA / Foundation Fieldbus transmitter	2-wire HART 7 temperature transmitter			
RTD, linear resistance, TC, mV, potentiometer						
mA, HART communication, Profibus PA, Foundation Fieldbus						
INPUT:						
mV, measurement range		-800...+800 mV	± 800 mV, -0.1...+1.7 V			
mV, min. span			2.5 mV			
RTD, measurement range / min. span		-200...+850°C / -	-200...+850°C / 10°C			
Lin. R, measurement range / min. span		0...10 kΩ / -	0...100 kΩ / 25 Ω			
Potentiometer	0...100 kΩ / 1 kΩ	0...100 kΩ	10 Ω...100 kΩ / 10%			
Sensor connection, wires	2 - 3 - 4	2 - 3 - 4				
TC types		BEJKLNRSTUW3W5	BEJKLNRSTUW3W5Lr			
Max. offset	50% of selec. max. value					
Cold junction compensation	Internal / external	Internal / external	Internal / external			
OUTPUT:						
mA, signal range / min. span	3.5...23 mA / 16 mA	Profibus PA/Foundation F.	3.5...23 mA / 16 mA			
TECHNICAL SPECIFICATIONS:						
Ambient temperature	-40...+85°C	-40...+85°C	-50...+85°C			
Supply voltage, DC	8...35 VDC	9...32 VDC	7.5...48 VDC			
Max. required power	0.8 W	< 350 mW	< 850 mW			
Isolation voltage, test / operation		1500 VAC / 50 V	2.5 kVAC / 55 VAC			
Response time	0.33...60 s	1...60 s	70 ms			
Signal dynamics, input / output	19 bit / 16 bit	24 bit / -	24 bit / 18 bit			
Accuracy	≤ ±0.1% of span	≤ ±0.05% of MV	≤ ±0.05% of span			
Temperature coefficient	≤ ±0.01% of span / °C	≤ ±0.002% of MV / °C	≤ ±0.005% of span / °C			
NAMUR	NE 43	NE 21/43/44/89/107				
Channels	1	1	1 or 2*			
Programming	5909	Profibus PA/Foundation F.	5909 / HART 7 / HART 5			
APPROVALS:						
ATEX, Zone 2	✓	✓	✓			
IECEx, Zone 2	✓		✓			
CSA, Zone 2 - DIV 2		✓	✓			
FM, Zone 2 - DIV 2		✓	✓			
INMETRO	✓		✓			
NEPSI		✓	✓			
DNV-GL / EU-RO marine	✓ / -		- / (✓)			
EAC	✓	✓	✓			
SIL 2, Hardware Assessment						
SIL 2/3 Full Assessment IEC 61508			✓ / ✓			

APPLICATION GUIDE:			
RTD / TC / mV input		✓ / ✓ / ✓	✓ / ✓ / ✓
Lin. R / potentiometer input	✓ / ✓	✓ / ✓	✓ / ✓
Dual input (4 terminals)		✓	
True dual input (7 terminals)			✓
Custom sensor linearization	✓	✓	✓
mA output	✓		✓
Loop-powered	✓		✓
Galvanically isolated		✓	✓
HART protocol			✓
Mounting in Zone 2 / DIV 2	✓ / -	✓ / ✓	✓ / ✓
Process signal calibration	✓	✓	✓



= Full Assessment acc. to IEC 61508

(✓) = Approval pending

Of span = Of the presently selected range

* = Single or true dual inputs

Of MV = Of the present measurement value

TEMPERATURE TRANSMITTERS



TYPE	6331A	6333A	6334A	6335A	6337A	6350A
INPUT:	Z-wire programmable transmitter	Z-wire programmable transmitter	Z-wire programmable transmitter	2-wire HART 5 transmitter	2-wire HART 7 transmitter	Profibus PA / Foundation Fieldbus transmitter
RTD, linear resistance, TC, mV, mA, potentiometer						
mA, HART communication, Profibus PA, Foundation Fieldbus						
INPUT:						
mA, measurement range / min. span						-100...+100 mA / -
mV, measurement range / min. span	-12...800 mV / 5 mV		-12...+150 mV / 5 mV	-800...+800 mV / 2.5 mV	-800...+800 mV / 2.5 mV	-800...+800 mV / -
RTD, measurement range / min. span	-200...+850°C / 25°C	-200...+850°C / 25°C		-200...+850°C / 10°C	-200...+850°C / 10°C	-200...+850°C / -
Lin. R, measurement range / min. span	0...5000 Ω / 30 Ω	0...10 kΩ / 30 Ω		0...7000 Ω / 25 Ω	0...7000 Ω / 25 Ω	0...10 kΩ / -
Potentiometer						0...100 kΩ / -
Sensor connection, wires	2 - 3 - 4	2 - 3		2 - 3 - 4	2 - 3 - 4	2 - 3 - 4
TC types	BEJKNRSTUW3W5Lr		BEJKNRSTUW3W5Lr	BEJKNRSTUW3W5	BEJKNRSTUW3W5	BEJKNRSTUW3W5
Max. offset	50% of selec. max. value	50% of selec. max. value	50% of selec. max. value	50% of selec. max. value	50% of selec. max. value	
Cold junction compensation	Internal / external		Internal	Internal / external	Internal / external	Internal / external
OUTPUT:						
mA, signal range / min. span	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA	Profibus PA/Foundation F.
TECHNICAL SPECIFICATIONS:						
Ambient temperature	-40...+85°C	-40...+85°C	-40...+85°C	-40...+85°C	-40...+85°C	-40...+85°C
Supply voltage, DC	7.2...35 VDC	8...35 VDC	7.2...35 VDC	8...35 VDC	8...35 VDC	9...32 VDC
Max. required power, 1 / 2 channels	0.8 W / 1.6 W	0.8 W / 1.6 W	0.8 W / 1.6 W	0.8 W / 1.6 W	0.8 W / 1.6 W	< 350 mW per channel
Isolation voltage, test / operation	1500 VAC / 50 V		1500 VAC / 50 V	1500 VAC / 50 V	1500 VAC / 50 V	1500 VAC / 50 V
Response time	1...60 s	0.33...60 s	1...60 s	1...60 s	1...60 s	1...60 s
Signal dynamics, input / output	20 bit / 16 bit	19 bit / 16 bit	18 bit / 16 bit	22 bit / 16 bit	22 bit / 16 bit	24 bit / -
Accuracy	≤ ±0.05% of span	≤ ±0.1% of span	≤ ±0.05% of span	≤ ±0.05% of span	≤ ±0.05% of span	≤ ±0.05% of MV
Temperature coefficient	≤ ±0.01% of span / °C	≤ ±0.01% of span / °C	≤ ±0.01% of span / °C	≤ ±0.005% of span / °C	≤ ±0.005% of span / °C	≤ ±0.002% of MV / °C
NAMUR	NE 21, NE 43	NE 43	NE 21, NE 43, NE 89	NE 21, NE 43, NE 89	NE 21, NE 43, NE 89	NE 21, NE 43
Channels	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2
Programming	5909	5909	5909	5909/HART 5	5909/HART 7/HART 5	Profibus PA/Foundation F.
APPROVALS:						
ATEX, Zone 2	✓	✓	✓	✓	✓	✓
IECEx, Zone 2	✓	✓	✓	✓	✓	✓
CSA, Zone 2 - DIV 2						✓
FM, Zone 2 - DIV 2						✓
UL 61010 / 508						
DNV-GL						
EAC	✓	✓	✓	✓	✓	✓
SIL 2, Hardware Assessment				✓	✓	
SIL 2 Full Assessment IEC 61508						

APPLICATION GUIDE:	✓ / ✓ / ✓	✓ / - / -	- / ✓ / ✓	✓ / ✓ / ✓	✓ / ✓ / ✓	✓ / ✓ / ✓
RTD / TC / mV input	✓ / ✓ / ✓	✓ / - / -	- / ✓ / ✓	✓ / ✓ / ✓	✓ / ✓ / ✓	✓ / ✓ / ✓
Lin. R / potentiometer input	✓ / -	✓ / -		✓ / -	✓ / -	✓ / ✓
Dual input (4 terminals)				✓	✓	✓
Custom sensor linearization	✓	✓	✓	✓	✓	✓
mA output	✓	✓	✓	✓	✓	✓
Loop-powered	✓	✓	✓	✓	✓	✓
Galvanically isolated	✓		✓	✓	✓	✓
HART protocol				✓	✓	
Mounting in Zone 2 / DIV 2	✓ / -	✓ / -	✓ / -	✓ / -	✓ / -	✓ / ✓
Process signal calibration	✓	✓	✓	✓	✓	✓

TEMPERATURE TRANSMITTERS



TYPE	6437A	7501	9113A			
INPUT:	2-wire HART 7 temperature transmitter	Field mounted HART temperature transmitter	Temperature / mA converter			
RTD, linear resistance, TC, mV, mA, potentiometer						
mA, measurement range / min. span			0...23 mA / 16 mA			
mV, measurement range	± 800 mV, -0.1...+1.7 V	-800...+800 mV				
mV, min. span	2.5 mV	2.5 mV				
RTD, measurement range / min. span	-200...+850°C / 10°C	-200...+850°C / 10°C	-200...+850°C / 25°C			
Lin. R, measurement range / min. span	0...100 kΩ / 25 Ω	0...7000 Ω / 25 Ω				
Potentiometer	10 Ω...100 kΩ / 10%					
Sensor connection, wires	2 - 3 - 4	2 - 3 - 4	2 - 3 - 4			
TC types	BEJKLNRSTUW3W5Lr	BEJKLNRSTUW3W5	BEJKLNRSTUW3W5Lr			
Cold junction compensation	Internal / external	Internal / external	Internal / external			
OUTPUT:						
mA, signal range / min. span	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA	0...23 mA / 16 mA			
TECHNICAL SPECIFICATIONS:						
Ambient temperature	-50...+85°C	-40...+85°C	-20...+60°C			
Supply voltage, DC	7.5...48 VDC	10 / 12...35 VDC	19.2...31.2 VDC			
Max. required power, 1 / 2 channels	< 850 mW / -		≤ 0.8 W / ≤ 1.4 W			
Isolation voltage, test / operation	2.5 kVAC / 55 VAC	1500 VAC / 50 VAC	2.6 kVAC / 250 VAC			
Response time	70 ms	22 bit / 16 bit	0.4 / 1...60 s			
Signal dynamics, input / output	24 bit / 18 bit	1...60 s	24 bit / 16 bit			
Accuracy	≤ ±0.05% of span	≤ ±0.05% of span	≤ ±0.1% of span			
Temperature coefficient	< ±0.005% of span / °C	< ±0.005% of span / °C	< ±0.01% of span / °C			
NAMUR	NE 21 / 43 / 44 / 89 / 107	NE 21, NE 43	NE 21, NE 43			
Channels	1 or 2*	1	1 or 2			
Programming	5909 / HART 7 / HART 5	LOI / HART	4500 series devices			
APPROVALS:						
ATEX, Zone 2	✓	✓	✓			
IECEx, Zone 2	✓	✓				
CSA, Zone 2 - DIV 2	✓					
FM, Zone 2 - DIV 2	✓					
INMETRO / NEPSI	✓ / ✓					
UL 61010 / 508			✓ / -			
DNV-GL / EU-RO marine	- / (✓)	- / ✓	✓ / -			
EAC	✓	✓	✓			
SIL 2, Hardware Assessment		✓				
SIL 2/3 Full Assessment IEC 61508	✓ / ✓		✓ / -			

APPLICATION GUIDE:

RTD / TC / mV input	✓ / ✓ / ✓	✓ / ✓ / ✓	✓ / ✓ / -			
Lin. R / potentiometer input	✓ / ✓	✓ / -				
Dual input (4 terminals)		✓				
True dual input (8 terminals)	✓					
Custom sensor linearization	✓	✓				
mA output	✓	✓	✓			
Loop-powered	✓	✓				
Galvanically isolated	✓	✓	✓			
HART protocol	✓	✓				
Process signal calibration	✓	✓	✓			
Power rail option		✓				



= Full assessment acc. to IEC 61508
(✓) = Approval pending



= FMEDA report
* = Single or true dual inputs

LOI = Local operator interface

Of span = Of the presently selected range



TYPE	5331D	5332D	5333D	5334B	5335D	5337D
INPUT: RTD, linear resistance, TC, mV, potentiometer	2-wire programmable transmitter	2-wire programmable RTD transmitter	2-wire programmable transmitter	2-wire programmable transmitter	2-wire transmitter with HART 5 protocol	2-wire transmitter with HART 7 protocol
OUTPUT: mA, HART communication						
INPUT: mV, measurement range / min. span	-12...800 mV / 5 mV			-12...150 mV / 5 mV	-800...+800 mV / 2.5 mV	-800...+800 mV / 2.5 mV
RTD, measurement range / min. span	-200...+850°C / 25°C	-200...+850°C / 25°C	-200...+850°C / 25°C		-200...+850°C / 10°C	-200...+850°C / 10°C
Lin. R, measurement range / min. span	0...5000 Ω / 30 Ω	0...5000 Ω / 30 Ω	0...10 kΩ / 30 Ω		0...7000 Ω / 25 Ω	0...7000 Ω / 25 Ω
Potentiometer						
Sensor connection, wires	2 - 3 - 4	2 - 3 - 4	2 - 3		2 - 3 - 4	2 - 3 - 4
TC types	BEJKNRSTUW3W5Lr			BEJKNRSTUW3W5Lr	BEJKNRSTUW3W5	BEJKNRSTUW3W5
Max. offset						
Cold junction compensation	Internal / external	Internal / external		Internal	Internal / external	Internal / external
OUTPUT: mA, signal range / min. span	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA
TECHNICAL SPECIFICATIONS:						
Ambient temperature	-40...+85°C	-40...+85°C	-40...+85°C	-40...+85°C	-40...+85°C	-40...+85°C
Supply voltage, DC	7.2...30 VDC	7.2...30 VDC	8...30 VDC	7.2...30 VDC	8...30 VDC	8...30 VDC
Max. required power	0.7 W	0.7 W	0.7 W	0.7 W	0.7 W	0.7 W
Isolation voltage, test / operation	1500 VAC / 50 V			1500 VAC / 50 V	1500 VAC / 50 V	1500 VAC / 50 V
Response time	1...60 s	1...60 s	0.33...60 s	1...60 s	1...60 s	1...60 s
Signal dynamics, input / output	20 bit / 16 bit	20 bit / 16 bit	19 bit / 16 bit	18 bit / 16 bit	22 bit / 16 bit	22 bit / 16 bit
Accuracy	≤ ±0.05% of span	≤ ±0.05% of span	≤ ±0.1% of span	≤ ±0.05% of span	≤ ±0.05% of span	≤ ±0.05% of span
Temperature coefficient	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.005% of span / °C	< ±0.005% of span / °C
NAMUR	NE 21, NE 43	NE 21, NE 43	NE 43	NE 21, NE 43	NE 21, NE 43, NE89	NE 21, NE 43, NE89
Channels	1	1	1	1	1	1
Programming	5909	5909	5909	5909	5909/HART 5	5909/HART 7/HART 5
APPROVALS:						
ATEX	✓	✓	✓	✓	✓	✓
IECEx	✓	✓	✓	✓	✓	✓
FM	✓	✓	✓	✓	✓	✓
CSA		✓	✓		✓	✓
INMETRO	✓	✓	✓	✓	✓	✓
DNV-GL	✓	✓	✓	✓	✓	✓
EAC Ex	✓		✓	✓	✓	✓
NEPSI						
SIL 2 Hardware Assessment					✓	✓
APPLICATION GUIDE:						
RTD / TC / mV input	✓ / ✓ / ✓	✓ / - / -	✓ / - / -	- / ✓ / ✓	✓ / ✓ / ✓	✓ / ✓ / ✓
Lin. R / potentiometer input	✓ / -	✓ / -	✓ / -		✓ / -	✓ / -
Dual input (4 terminals)						
Custom sensor linearization	✓	✓	✓	✓	✓	✓
mA output	✓	✓	✓	✓	✓	✓
Loop-powered	✓	✓	✓	✓	✓	✓
Galvanically isolated	✓			✓	✓	✓
HART protocol					✓	✓
Process signal calibration	✓	✓	✓	✓	✓	✓

I.S. TEMPERATURE TRANSMITTERS



SIL 2/3



TYPE	5343B	5350B	5437D			
INPUT:	2-wire level transmitter	Profibus PA / Foundation Fieldbus transmitter	2-wire HART 7 temperature transmitter			
RTD, linear resistance, TC, mV, potentiometer						
mA, HART communication, Profibus PA, Foundation Fieldbus						
INPUT:						
mV, measurement range		-800...+800 mV	-± 800 mV, -0.1...+1.7 V			
mV, min. span			2.5 mV			
RTD, measurement range / min. span		-200...+850°C / -	-200...+850°C / 10°C			
Lin. R, measurement range / min. span	0...100 kΩ / 1 kΩ	0...10 kΩ / -	0...100 kΩ / 25 Ω			
Potentiometer	1 kΩ...100 kΩ	0...100 kΩ	10 Ω...100 kΩ / 10%			
Sensor connection, wires	2 - 3 - 4	2 - 3 - 4				
TC types		BEJKNRSTUW3W5	BEJKNRSTUW3W5Lr			
Max. offset	50% of selec. max. value					
Cold junction compensation		Internal / external	Internal / external			
OUTPUT:						
mA, signal range / min. span	3.5...23 mA / 16 mA	Profibus PA/Foundation F.	3.5...23 mA / 16 mA			
TECHNICAL SPECIFICATIONS:						
Ambient temperature	-40...+85°C	-40...+85°C	-50...+85°C			
Supply voltage, DC	8...30 VDC	9...32 VDC	7.5...30 VDC			
Max. required power	0.7 W	< 350 mW	< 850 mW			
Isolation voltage, test / operation		1500 VAC / 50 V	2.5 kVAC / 42 VAC			
Response time	0.33...60 s	1...60 s	70 ms			
Signal dynamics, input / output	19 bit / 16 bit	24 bit / -	24 bit / 18 bit			
Accuracy	≤ ±0.1% of span	≤ ±0.05% of MV	≤ ±0.05% of span			
Temperature coefficient	≤ ±0.01% of span / °C	≤ ±0.002% of MV / °C	≤ ±0.005% of span / °C			
NAMUR	NE 43	NE 21, NE 43	NE 21/43/44/89/107			
Channels	1	1	1 or 2*			
Programming	5909	Profibus PA/Foundation F.	5909 / HART 7 / HART 5			
APPROVALS:						
ATEX	✓	✓	✓			
IECEx	✓	✓	✓			
FM	✓	✓	✓			
CSA	✓	✓	✓			
INMETRO	✓	✓	✓			
DNV-GL / EU-RO marine	✓ / -		- / (✓)			
EAC Ex	✓	✓	✓			
NEPSI			✓			
SIL 2, Hardw. Assessment			✓ / ✓			
SIL 2/3 Full Assessment IEC 61508						
APPLICATION GUIDE:						
RTD / TC / mV input		✓ / ✓ / ✓	✓ / ✓ / ✓			
Lin. R / potentiometer input	✓ / ✓	✓ / ✓	✓ / ✓			
Dual input (4 terminals)		✓				
True dual input (7 terminals)	✓		✓			
Custom sensor linearization	✓	✓	✓			
mA output	✓		✓			
Bus-powered PA/FF		✓ / ✓				
Loop-powered			✓			
Galvanically isolated	✓	✓	✓			
HART protocol			✓			
Process signal calibration		✓	✓			



= Full Assessment acc. to IEC 61508

(✓) = Approval pending

* = Single or true dual inputs

Of span = Of the presently selected range

Of MV = Of the present measurement value



TYPE	6331B	6333B	6334B	6335D	6337D	6350B
INPUT:	2-wire programmable transmitter	2-wire programmable transmitter	2-wire programmable transmitter	2-wire HART 5 transmitter	2-wire HART 7 transmitter	Profibus PA / Foundation Fieldbus transmitter
RTD, linear resistance, TC, mV, mA, potentiometer						
mA, HART communication, Profibus PA, Foundation Fieldbus						
INPUT:						
mA, measurement range / min. span						-100...+100 mA
mV, measurement range / min. span	-12...800 mV / 5 mV		-12...+150 mV / 5 mV	-800...+800 mV / 2.5 mV	-800...+800 mV / 2.5 mV	-800...+800 mV / -
RTD, measurement range / min. span	-200...+850°C / 25°C	-200...+850°C / 25°C	-200...+850°C / 10°C	-200...+850°C / 10°C	-200...+850°C / 10°C	-200...+850°C / -
Lin. R, measurement range / min. span	0...5000 Ω / 30 Ω	0...10 kΩ / 30 Ω	0...7000 Ω / 25 Ω	0...7000 Ω / 25 Ω	0...10 kΩ / -	0...100 kΩ / -
Potentiometer						
Sensor connection, wires	2 - 3 - 4	2 - 3		2 - 3 - 4	2 - 3 - 4	2 - 3 - 4
TC types	BEJKNRSTUW3W5Lr		BEJKNRSTUW3W5Lr	BEJKNRSTUW3W5	BEJKNRSTUW3W5	BEJKNRSTUW3W5
Max. offset	50% of selec. max. value	50% of selec. max. value	50% of selec. max. value	50% of selec. max. value	50% of selec. max. value	
Cold junction compensation	Internal / external		Internal	Internal / external	Internal / external	Internal / external
OUTPUT:						
mA, signal range / min. span	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA	Profibus PA/Foundation F.
TECHNICAL SPECIFICATIONS:						
Ambient temperature	-40...+85°C	-40...+85°C	-40...+85°C	-40...+85°C	-40...+85°C	-40...+85°C
Supply voltage, DC	7.2...30 VDC	8...30 VDC	7.2...30 VDC	8...30 VDC	8...30 VDC	9...32 VDC
Max. required power, 1 / 2 channels	0.7 W / 1.4 W	0.7 W / 1.4 W	0.7 W / 1.4 W	0.7 W / 1.4 W	0.7 W / 1.4 W	< 350 mW per channel
Isolation voltage, test / operation	1500 VAC / 50 V		1500 VAC / 50 V	1500 VAC / 50 V	1500 VAC / 50 V	1500 VAC / 50 V
Response time	1...60 s	0.33...60 s	1...60 s	1...60 s	1...60 s	1...60 s
Signal dynamics, input / output	20 bit / 16 bit	19 bit / 16 bit	18 bit / 16 bit	22 bit / 16 bit	22 bit / 16 bit	24 bit / -
Accuracy	≤ ±0.05% of span	≤ ±0.1% of span	≤ ±0.05% of span	≤ ±0.05% of span	≤ ±0.05% of span	≤ ±0.05% of MV
Temperature coefficient	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.005% of span / °C	< ±0.005% of span / °C	< ±0.002% of MV / °C
NAMUR	NE 21, NE 43	NE 43	NE 21, NE 43	NE 21, NE 43, NE 89	NE 21, NE 43, NE 89	NE 21, NE 43
Channels	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2
Programming	5909	5909	5909	5909/HART 5	5909/HART 7/HART 5	Profibus PA/Foundation F.
APPROVALS:						
ATEX	✓	✓	✓	✓	✓	✓
IECEx	✓	✓	✓	✓	✓	✓
FM	✓	✓	✓	✓	✓	✓
CSA	✓	✓	✓	✓	✓	✓
UL						
DNV-GL						
EAC Ex	✓	✓	✓	✓	✓	✓
SIL 2, Hardware Assessment						
APPLICATION GUIDE:						
RTD / TC / mV input	✓ / ✓ / ✓	✓ / - / -	- / ✓ / ✓	✓ / ✓ / ✓	✓ / ✓ / ✓	✓ / ✓ / ✓
Lin. R / potentiometer input	✓ / -	✓ / -		✓ / -	✓ / -	✓ / ✓
Dual input (4 terminals)						
Custom sensor linearization	✓	✓	✓	✓	✓	✓
mA output	✓	✓	✓	✓	✓	
Bus-powered PA/FF						
Loop-powered	✓	✓	✓	✓	✓	✓ / ✓
Galvanically isolated	✓	✓	✓	✓	✓	✓
HART protocol						
Process signal calibration	✓	✓	✓	✓	✓	✓



HART
COMMUNICATION FOUNDATION
SIL 2/3

HART
COMMUNICATION FOUNDATION

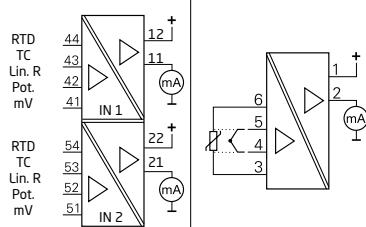
**TYPE****6437D****7501****INPUT:**

RTD, linear resistance,
TC, mV, potentiometer

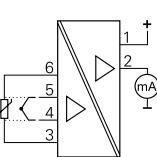
OUTPUT:

mA,
HART communication

2-wire HART 7
temperature
transmitter



Field mounted
HART temperature
transmitter

**INPUT:**

mA, measurement range / min. span

mV, measurement range

mV, min. span

RTD, measurement range / min. span

Lin. R, measurement range / min. span

Potentiometer

Sensor connection, wires

TC types

Cold junction compensation

± 800 mV, -0.1...+1.7 V

2.5 mV

-200...+850°C / 10°C

0...100 kΩ / 25 Ω

10 Ω...100 kΩ / 10%

2 - 3 - 4

BE/J/K/L/N/R/S/T/U/W/3W/5Lr

Internal / external

800...+800 mV

2.5 mV

-200...+850°C / 10°C

0...7000 Ω / 25 Ω

2 - 3 - 4

BE/J/K/L/N/R/S/T/U/W/3W/5

Internal / external

OUTPUT:

mA, signal range / min. span

3.5...23 mA / 16 mA

3.5...23 mA / 16 mA

TECHNICAL SPECIFICATIONS:

Ambient temperature

-50...+85°C

-40...+85°C

Supply voltage, DC

7.5...30 VDC

10 / 12...30 VDC

Max. required power, 1 / 2 channels

< 850 mW / -

Isolation voltage, test / operation

2.5 kVAC / 42 VAC

1500 VAC / 50 V

Signal dynamics, input / output

70 ms

22 bit / 16 bit

Response time

24 bit / 18 bit

1..60 s

Accuracy

≤ ±0.05% of span

≤ ±0.05% of span

Temperature coefficient

< ±0.005% of span / °C

< ±0.005% of span / °C

NAMUR

NE 21/43/44/89/107

NE 21, NE 43

Channels

1 or 2*

1

Programming

5909 / HART 7 / HART 5

LOI / HART

APPROVALS:

ATEX

✓

✓

IECEx

✓

✓

FM

✓

✓

CSA

✓

✓

INMETRO

✓

✓

EU-RO marine

(✓)

✓

EAC Ex

✓

✓

NEPSI

✓

✓

SIL 2 Hardware Assessment

✓ / ✓

✓

SIL 2/3 Full Assessment IEC 61508

✓ / ✓

✓

APPLICATION GUIDE:

RTD / TC / mV input

✓ / ✓ / ✓

✓ / ✓ / ✓

Lin. R / potentiometer input

✓ / ✓

✓ / -

Dual input (4 terminals)

✓

True dual input (8 terminals)

✓

Custom sensor linearization

✓

✓

mA output

✓

✓

Bus-powered PA/FF

Loop-powered

✓

✓

Galvanically isolated

✓

✓

HART protocol

✓

✓

Process signal calibration

✓

✓



= Full assessment acc. to IEC 61508
(✓) = Approval pending

= FMEDA report
* = Single or true dual inputs

LOI = Local operator interface
Of span = Of the presently selected range

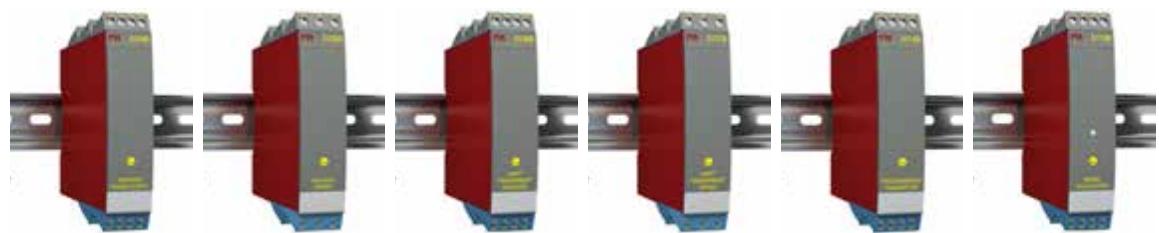


TYPE	9106B	9107B	9113B	9116B	9202B	9203B
INPUT:	HART transparent repeater	HART transparent driver	Temperature / mA converter	Universal converter	Pulse isolator	Solenoid / alarm driver
mA, mV, V, potentiometer, RTD, Lin. R, TC, Hz, HART communication						
mA, relays, HART communication						
INPUT:	mA, measurement range / min. span	3.5...23 mA / 16 mA	3.5 ...23 mA / 16 mA	0...23 mA / 16 mA	0...23 mA / 16 mA	
V, measurement range / min. span						
RTD, measurement range / min. span			-200...+850°C / 25°C			
Lin. R, measurement range / min. span				-200...+850°C / 25°C		
Potentiometer				0...10000 Ω / -		
Sensor connection, wires		2 - 3 - 4		10 Ω...10000 Ω		
TC types			BEJJKLNRSTUW3W5Lr	BEJJKLNRSTUW3W5Lr		
Sensor type					NAMUR / switch	
Hz, measurement range / min. span					0...5 kHz	
Min. pulse width					100 µs	
OUTPUT:	mA, signal range / min. span	3.5...23 mA / 16 mA	3.5...23 mA / 16 mA	0...23 mA / 16 mA	0 ...23 mA / 16 mA	
Pulse output					NPN / relay	
Hz, signal range					0...5 kHz	
Relay				1 x SPST, AC: 500 VA	1 x SPST, AC: 500 VA	
TECHNICAL SPECIFICATIONS:						
Ambient temperature	-20...+60°C	-20...+60°C	-20...+60°C	-20...+60°C	-20...+60°C	-20...+60°C
Supply voltage, DC	19.2...31.2 VDC	19.2...31.2 VDC	19.2...31.2 VDC	19.2...31.2 VDC	19.2...31.2 VDC	19.2...31.2 VDC
Max. required power, 1 / 2 channels	≤ 1.1 W / ≤ 1.9 W	≤ 1.0 W / ≤ 1.8 W	≤ 0.8 W / ≤ 1.4 W	≤ 2.1 W / -	≤ 1.1...1.3 W / ≤ 1.5...1.9 W	≤ 1.9...2.5 W / ≤ 3.1 W
Isolation voltage, test / operation	2.6 kVAC / 250 VAC	2.6 kVAC / 250 VAC	2.6 kVAC / 250 VAC	2.6 kVAC / 250 VAC	2.6 kVAC / 250 VAC	2.6 kVAC / 250 VAC
Response time	< 5 ms	< 5 ms	0.4 / 1...60 s	0.4 / 1...60 s	200 ms	< 10 ms
Signal dynamics, input / output	Analog signal chain	Analog signal chain	24 bit / 16 bit	24 bit / 16 bit		
Accuracy	< ±16 µA	< ±16 µA	≤ ±0.1% of span	≤ ±0.1% of span		
Temperature coefficient	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C	< ±0.01% of span / °C		
NAMUR	NE 21	NE 21	NE 21, NE 43	NE 21, NE 43	NE 21	NE 21
Channels	1 or 2	1 or 2	1 or 2	1	1 or 2	1 or 2
Programming	4500 series devices	4500 series devices	4500 series devices	4500 series devices	4500 series devices	4500 series devices
APPROVALS:						
ATEX	✓	✓	✓	✓	✓	✓
IECEx	✓	✓	✓	✓	✓	✓
FM	✓	✓	✓	✓	✓	✓
INMETRO	✓	✓	✓	✓	✓	✓
UL 61010	✓	✓	✓	✓	✓	✓
DNV-GL	✓	✓	✓	✓	✓	✓
EAC Ex	✓	✓	✓	✓	✓	✓
SIL 2/3 Full Assessment IEC 61508	✓ / ✓	✓ / -	✓ / -	✓ / -	✓ / -	✓ / -
APPLICATION GUIDE:						
AI barrier	✓		✓	✓		
AO barrier		✓				
DI barrier						
DO barrier	✓ / - / -	✓ / - / -	✓ / - / ✓	✓ / ✓ / ✓		
mA / V / temperature input	✓ / - / -	✓ / - / -	✓ / - / ✓	✓ / ✓ / ✓		
4...20 mA Tx input	✓			✓		
mA / V / relay output	✓ / - / -	✓ / - / -	✓ / - / -	✓ / - / ✓	- / - / ✓	
Active / passive mA output	✓ / ✓	✓ / -	✓ / ✓	✓ / ✓		
HART signal transparent	✓	✓		✓		
Process signal calibration				✓		
Power rail option	✓	✓	✓	✓	✓	✓



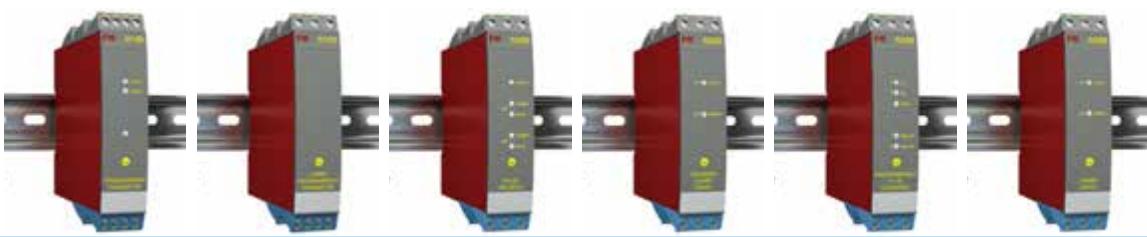
= Full assessment acc. to IEC 61508

Of span = Of the presently selected range



TYPE	5104B	5105B	5106B	5107B	5114B	5115B
INPUT: mA, mV, V, potentiometer, RTD, linear resistance, TC, HART communication	Ex repeater / power supply	Ex-isolated driver	HART transparent repeater	HART transparent driver	Programmable transmitter	Signal calculator
OUTPUT: mA, V, relays, HART communication						
INPUT: mA, measurement range / min. span V, measurement range / min. span mV, measurement range / min. span RTD, measurement range / min. span Lin. R, measurement range / min. span Potentiometer Sensor connection, wires TC types Max. offset	0...23 mA / 16 mA 0...10 VDC / 8 VDC	0...23 mA / 16 mA 0...10 VDC / 8 VDC	3.5...23 mA / 16 mA 3.5...23 mA / 16 mA	3.5...23 mA / 16 mA 3.5...23 mA / 16 mA	0...100 mA / 4 mA 0...250 VDC / 5 mV -150...+150 mV / 5 mV -200...+850°C / 25°C 0...5000 Ω / 30 Ω 200 Ω...100 kΩ 2 - 3 - 4 BEJKLNRSTUW3W5Lr	0...100 mA / 4 mA 0...250 VDC / 5 mV -150...+150 mV / 5 mV -200...+850°C / 25°C 0...5000 Ω / 30 Ω 200 Ω...100 kΩ 2 - 3 - 4 BEJKLNRSTUW3W5Lr
OUTPUT: mA, signal range / min. span Load (@ current output) V, signal range / min. span Max. offset	0...23 mA / 16 mA ≤ 600 Ω	0...23 mA / 16 mA ≤ 770 Ω	3.5...23 mA / 16 mA ≤ 600 Ω	3.5...23 mA / 16 mA ≤ 770 Ω	0...23 mA / 10 mA 600 Ω	0...23 mA / 10 mA 600 Ω
TECHNICAL SPECIFICATIONS: Ambient temperature Supply voltage, AC / DC Max. required power, 1 / 2 channels Isolation voltage, test / operation Response time Signal dynamics, input / output Accuracy Temperature coefficient NAMUR Channels Programming	-20...+60°C 21.6...253V / 19.2...300V 2.0 W / 2.8 W 3.75 kVAC / 250 VAC < 25 ms Analog signal chain ≤ ±0.1% of span < ±0.01% of span / °C NE 21 1 or 2 DIP switch	-20...+60°C 21.6...253V / 19.2...300V 1.3 W / 2.0 W 3.75 kVAC / 250 VAC < 25 ms Analog signal chain ≤ ±0.1% of span < ±0.01% of span / °C NE 21 1 or 2 DIP Switch	-20...+60°C 21.6...253V / 19.2...300V 2.0 W / 2.8 W 3.75 kVAC / 250 VAC < 25 ms Analog signal chain ≤ ±0.1% of span < ±0.01% of span / °C NE 21 1 or 2 No	-20...+60°C 21.6...253V / 19.2...300V 1.4 W / 2.1 W 3.75 kVAC / 250 VAC < 25 ms Analog signal chain ≤ ±0.1% of span < ±0.01% of span / °C NE 21 1 or 2 No	-20...+60°C 21.6...253V / 19.2...300V 2.1 W / 2.8 W 3.75 kVAC / 250 VAC 250 ms...60 s 22 bit / 16 bit ≤ ±0.05% of span < ±0.01% of span / °C NE 21, NE 43 1 or 2 5909 + DIP switch	-20...+60°C 21.6...253V / 19.2...300V 2.1 W / 2.8 W 3.75 kVAC / 250 VAC 250 ms...60 s 22 bit / 16 bit ≤ ±0.05% of span < ±0.01% of span / °C NE 21, NE 43 2 5909 + DIP switch
APPROVALS: ATEX IECEx FM CSA UL DNV-GL EAC Ex	✓	✓	✓	✓	✓	✓
APPLICATION GUIDE: AI barrier AO barrier DI barrier DO barrier RTD / TC input mA / V / mV input 4...20 mA Tx input Lin. R / potentiometer input mA / V / relay output Active / passive mA output Process signal calibration	✓	✓	✓	✓	✓ / ✓ / ✓	✓ / ✓ / ✓

Of span = Of the presently selected range



TYPE	5116B	5131B	5202B	5203B	5223B	5420B
INPUT: mA, mV, V, potentiometer, RTD, linear resistance, TC, Hz OUTPUT: mA, V, relays	Programmable transmitter 	2-wire programmable transmitter 	Pulse isolator 	Ex solenoid / alarm driver 	Programmable f/I - f/f converter 	Ex power supply for 2-wire Tx
INPUT: mA, measurement range / min. span V, measurement range / min. span mV, measurement range / min. span RTD, measurement range / min. span Lin. R, measurement range / min. span Potentiometer Sensor connection, wires TC types Sensor type Hz, measurement range / min. span OUTPUT: mA, signal range / min. span Pulse output Hz, signal range Relays Voltage / current	0...100 mA / 4 mA 0...250 VDC / 5 mV -2500...+2500 mV/5 mV -200...+850°C / 25°C 0...5000 Ω / 30 Ω 200 Ω...100 kΩ 2 - 3 - 4 BEjKLNRSUW3W5Lr NAMUR / switch 0...5 kHz 0...23 mA / 10 mA NPN / relay 0...5 kHz 2 x SPST, AC: 500 VA	0...100 mA / 4 mA 0...250 VDC / 5 mV -150...+150 mV / 5 mV -200...+850°C / 25°C -200...+850°C / 25°C 2 - 3 - 4 BEjKLNRSUW3W5Lr NPN / PNP / switch 0...5 kHz 3.5...23 mA / 10 mA Valves etc. 0...5 kHz 2 x SPDT, AC: 100 VA				
TECHNICAL SPECIFICATIONS: Ambient temperature Supply voltage, AC / DC Max. required power, 1 / 2 channels Isolation voltage, test / operation Response time Signal dynamics, input / output Accuracy Temperature coefficient NAMUR Channels Programming	-20...+60°C 21.6...253 V / 19.2...300 V 2.4 W / - 3.75 kVAC / 250 VAC 250 ms...60 s 22 bit / 16 bit ≤ ±0.05% of span < ±0.01% of span / °C NE 21, NE 43 1 5909	-20...+60°C -/ 7.5...35 VDC 0.8 W / 1.6 W 3.75 kVAC / 250 VAC 250 ms...60 s 22 bit / 16 bit ≤ ±0.05% of span < ±0.01% of span / °C NE 21, NE 43 1 or 2 5909 + DIP switch	-20...+60°C 21.6...253 V / 19.2...300 V -/ 1.8 W 3.75 kVAC / 250 VAC 250 ms...60 s 22 bit / 16 bit ≤ ±0.05% of span < ±0.01% of span / °C NE 21 2 DIP switch	-20...+60°C 21.6...253 V / 19.2...300 V 2.0 W / 2.5 W 3.75 kVAC / 250 VAC 60 ms...1000 s - / 16 bit NE 21 1 or 2 DIP switch	-20...+60°C 21.6...253 V / 19.2...300 V 3 W / - 3.75 kVAC / 250 VAC 60 ms...1000 s - / 16 bit NE 21 1 5909 + DIP switch	-20...+60°C 21.6...253 V / 19.2...300 V -/ 2.5 W 3.75 kVAC / 250 VAC 60 ms...1000 s - / 16 bit NE 21 2 No
APPROVALS: ATEX IECEx FM CSA UL DNV-GL EAC Ex SIL 2, Hardware Assessment	✓	✓	✓	✓	✓	✓
APPLICATION GUIDE: AI barrier AO barrier DI barrier DO barrier mA / V / temperature input 4...20 mA Tx input mA / V / relay output Active / passive mA output Process signal calibration	✓	✓	✓	✓	✓	✓



TYPE	5531A	5531B1	5714	5715	5725
INPUT:	Loop-powered LCD indicator	Loop-powered LCD indicator in I.S. enclosure	Programmable LED indicator	Programmable LED indicator	Programmable frequency indicator
RTD, TC, mV, mA, V, potentiometer, frequency, pulse					
OUTPUT:	Display, mA, relays				
mA, measurement range / min. span	3.6...23 mA / 16 mA	3.6...23 mA / 16 mA	0...23 mA / 16 mA	0...23 mA / 16 mA	
V, measurement range / min. span			0...12 VDC / 0.8 V	0...12 VDC / 0.8 V	
Sensor type					All standard sensors.
Hz, measurement range / min. span					0...50 kHz / 0.001 Hz
Min. pulse width					25 µs
RTD, measurement range / min. span			-200...+850°C	-200...+850°C	
Lin. R, measurement range / min. span			0...10000 Ω / -	0...10000 Ω / -	
Potentiometer			10 Ω...100 kΩ	10 Ω...100 kΩ	
Sensor connection, wires			2 - 3 - 4	2 - 3 - 4	
TC types			BEJ, K, LN, R, ST, U, W3, W5Lr	BEJ, K, LN, R, ST, U, W3, W5Lr	
Cold junction compensation			Internal	Internal	
Reference voltage / 2-wire supply			- / >15 VDC	- / >15 VDC	
Sensor supply					5...17 VDC
OUTPUT:					
Display, digit / type	4-digit / LCD	4-digit / LCD	4-digit / LED	4-digit / LED	4-digit / LED
Display, digit height	16 mm	16 mm	13.8 mm	13.8 mm	13.8 mm
mA, signal range / min. span			0...23 mA / 16 mA	0...23 mA / 16 mA	0...23 mA / 16 mA
Relay			2 x SPDT, AC: 500 VA	4 x SPDT, AC: 500 VA	2 x SPDT, AC: 500 VA
TECHNICAL SPECIFICATIONS:					
Ambient temperature	-20...+60°C	-20...+60°C	-20...+60°C	-20...+60°C	-20...+60°C
Supply voltage, universal AC / DC	- / 1.5 VDC	- / 1.5 VDC	21.6...253V / 19.2...300V	21.6...253V / 19.2...300V	21.6...253V / 19.2...300V
Max. required power	<35 mW	<35 mW	3.5 W	3.8 W	3.6 W
Isolation voltage, test / operation			2.3 kVAC / 250 VAC	2.3 kVAC / 250 VAC	2.3 kVAC / 250 VAC
Response time	< 1 s	< 1 s	< 400 ms / < 1 s	< 400 ms / < 1 s	1...60 s
Accuracy	≤ ±0.1% of span	≤ ±0.1% of span	≤ ±0.1% of reading	≤ ±0.1% of reading	≤ ±0.1% of reading
Temperature coefficient	≤ ±0.01% of span / °C	≤ ±0.01% of span / °C	≤ ±0.01% of reading / °C	≤ ±0.01% of reading / °C	≤ ±0.01% of reading / °C
NAMUR			NE 43	NE 43	NE 43
Programming	Switch / front keys	Switch / front keys	Front keys	5909 / front keys	Front keys
APPROVALS:					
ATEX, Zone 2	✓	✓			
UL 508			✓	✓	✓
DNV-GL / EU-RO marine			✓ / ✓	✓	✓ / ✓
EAC	✓	✓	✓	✓	✓

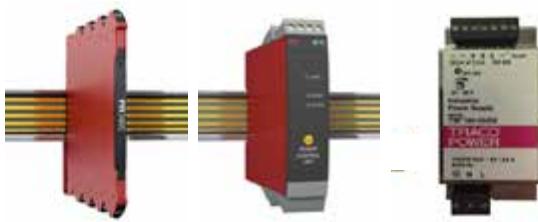
APPLICATION GUIDE:	5531A	5531B1	5714	5715	5725
mA / V / mV input	✓ / - / -	✓ / - / -	✓ / ✓ / -	✓ / ✓ / -	
Temperature input			✓	✓	
Lin. R / potentiometer input			✓ / ✓	✓ / ✓	
Frequency input					✓
Custom sensor linearization					✓
4...20 mA Tx input			✓	✓	
Loop-powered mA output	✓	✓			
2 / 4 relay outputs			✓ / -	- / ✓	✓ / -
Process signal calibration	✓	✓	✓	✓	✓
Mounting in Zone 2	✓	✓			

Of span = Of the presently selected range



TYPE	5531B	5531B2				
INPUT: mA	Loop-powered LCD indicator	Loop-powered LCD indicator in I.S. enclosure				
OUTPUT: Display						
INPUT: mA, measurement range / min. span	3.6...23 mA / 16 mA	3.6...23 mA / 16 mA				
OUTPUT: Display, digit / type Display, digit height	4-digit / LCD 16 mm	4-digit / LCD 16 mm				
TECHNICAL SPECIFICATIONS:						
Ambient temperature	-20...+60°C	-20...+60°C				
Supply voltage, universal AC / DC	- / 1.5 VDC	- / 1.5 VDC				
Max. required power	<35 mW	<35 mW				
Isolation voltage, test / operation						
Response time	< 1 s	< 1 s				
Accuracy	≤ ±0.1% of span	≤ ±0.1% of span				
Temperature coefficient	≤ ±0.01% of span / °C	≤ ±0.01% of span / °C				
NAMUR						
Programming	Switch / front keys	Switch / front keys				
APPROVALS:						
ATEX	✓	✓				
DNV-GL	✓	✓				
EAC Ex	✓	✓				
APPLICATION GUIDE:						
Loop-powered	✓	✓				
Mounting in Zone 1 / 21	✓	✓				
Field enclosure		✓				

POWER SUPPLIES



TYPE	3405	9410	9421			
INPUT: AC, DC voltage Stabilized VDC						
INPUT: Supply voltage, AC Supply voltage, DC Supply voltage, back-up			85...132 VAC or 187...264 VAC			
Voltage Current Power, max. Status relay	16.8...31.2 VDC 21.6...26.4 VDC 21.6...26.4 VDC	21.6...26.4 VDC 4 ADC 96 W 1 x SPDT, AC: 500 VA	24 VDC 4.8 ADC 115 W			
OUTPUT:						
Ambient temperature Max. required power Isolation, test Short circuit protection Output ripple Channels Programming	-25...+70°C 96 W 2.6 kVAC No Same as input 1 No	-20...+60°C < 135 W 4.3 kVAC Yes Same as input 1 Yes	-20...+60°C 200 mV peak / peak 1 No			
TECHNICAL SPECIFICATIONS:						
ATEX, Zone 2 IECEx, Zone 2 CSA, Zone 2 - DIV 2 FM, Zone 2 - DIV 2 UL 61010 / 508 DNV-GL EAC INMETRO, Zone 2 SIL 2 Full Assessment IEC 61508	✓ ✓ ✓ ✓ ✓ / - ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ / - ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ - / ✓ ✓ ✓ ✓ ✓ ✓			
APPROVALS:						
115 / 230 VAC mains supply 24 VDC output 60 W power rail connector unit 96 W power rail connector unit Redundancy power rail function Collective status signal monitor Internal fuse Mounting in Zone 2 / Div 2			✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓			


TYPE
2224
2231
2261
INPUT, DC:

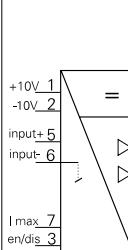
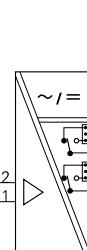
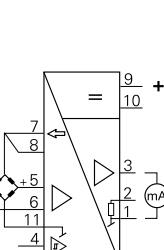
**mA, V, potentiometer,
frequency, pulse, joystick,
load cell, mV**

INPUT, AC:

A, V

OUTPUT:

mA, V, relays

Valve controller

Trip amplifier

mV transmitter

INPUT:

mA, DC measurement range / min. span

0...20 mA / 16 mA

0...20 mA / 10 mA

V, DC measurement range / min. span

-10...+10 VDC / 0.8 VDC

0...250 VDC / 0.5 VDC

A, AC measurement range / min. span

0...1 ARMS / 0.5 ARMS

0...250 VRMS/0.5 VRMS

Potentiometer

> 1 kΩ

Digital input

3 x PNP

1 x NPN / 1 x PNP

Max. offset

20% of selec. max. value

70% of selec. max. value

Excitation / reference voltage

- / -10...+10 VDC

5...13 VDC / -

OUTPUT:

mA, signal range / min. span

3000 mA

0...20 mA / 5 mA

V, signal range / min. span

Supply-0.5 VDC

0...10 VDC / 0.25 VDC

Max. offset

50% of selec. max. value

Relays

2 x SPST, AC: 500 VA

Display, digit / type

3-digit / LED

3-digit / LED

TECHNICAL SPECIFICATIONS:

Ambient temperature

-20...+60°C

-20...+60°C

Supply voltage, universal AC / DC

21.6...253 V / 19.2...300 V

19.2...28.8 VDC

Supply voltage, DC

12 or 24 VDC

19.2...28.8 VDC

Max. required power

2.2 W

1.5 W DC / 2 W, UNI

Isolation voltage, test / operation

3.75 kVAC / 250 VAC

Response time

< 75 ms

250 ms...60 s

Signal dynamics, input / output

12 bit / -

16 bit / -

Setpoint adjustment / repetition

0.1% / 0.1%

17 bit / 16 bit

Delay / hysteresis

0...99.9 s / 0...99.9%

Temperature coefficient

< ±0.01% of span / °C

< ±0.01% of span / °C

Channels

1 or 2 outputs

1 input, 2 relays

Programming

Switch / front keys

Switch / front keys

APPROVALS:

DNV-GL

✓

✓

EAC

✓

✓

✓

APPLICATION GUIDE:

mA / V / mV input

✓ / ✓ / -

✓ / ✓ / -

- / - / ✓

AC signal input

✓

Digital ON/OFF signal input

✓

✓

Controller / regulator function

✓

✓

Load cell applications

✓

Proportional valve applications

✓

Frequency / pulse applications

mA / V output

✓

Relay output

✓



TYPE 2255

INPUT, DC: Frequency, pulse INPUT, AC: A, V OUTPUT: mA, V, relays, pulse	f/I - f/f converter 			
--	--------------------------------	--	--	--

INPUT: PV / SP

A, AC measurement range / min. span						
V, AC measurement range / min. span						
Max. offset						
Sensor type	All standard sensors	△				
Hz, measurement range / min. span	0...20 kHz / 0.001 Hz					
Min. pulse width	25 µs					
Sensor supply	5..15 VDC					
OUTPUT:						
mA, signal range / min. span	0...20 mA / 5 mA					
V, signal range / min. span	0...10 VDC / 0.25 VDC					
Max. offset	50% of selec. max. value					
Load (@ current output)	≤ 600 Ω					
Pulse output	NPN					
Max. output frequency	1000 Hz					
Relays	1 x SPDT, AC: 300 VA					
Display, digit / type	3-digit / LED					

TECHNICAL SPECIFICATIONS:

Ambient temperature	-20...+60°C					
Supply voltage, universal AC / DC						
Supply voltage, DC	19.2...28.8 VDC					
Max. required power	2.4 W					
Isolation voltage, test / operation	1.4 kVAC / 150 VAC					
Response time	60 ms...999 s					
Signal dynamics, input / output	- / 16 bit					
Accuracy						
Temperature coefficient	< ±0.01% of span / °C					
Channels	1					
Programming	Switch / front keys					

APPROVALS

APPLICATION GUIDE

A user-friendly and reliable mounting solution between
the DCS/PLC/SIS system and isolators/I.S. interfaces

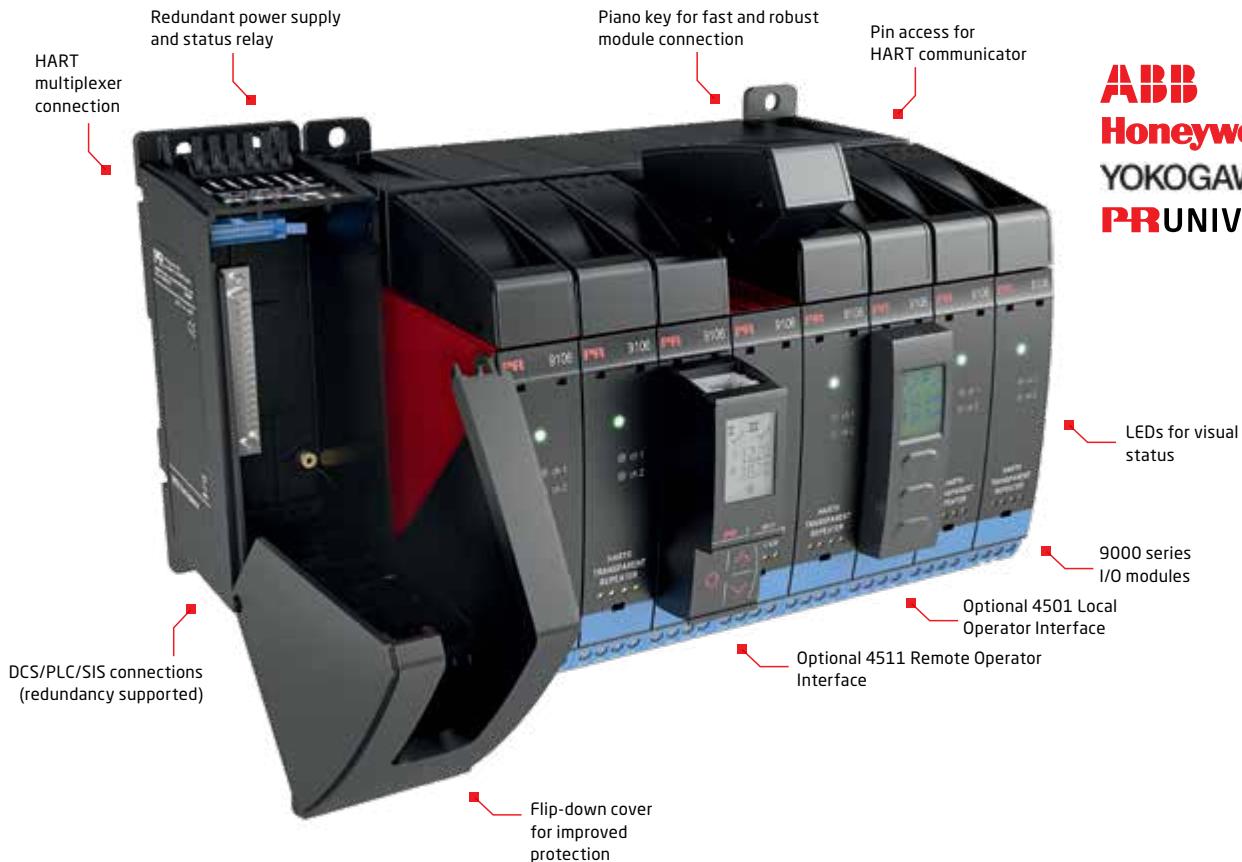
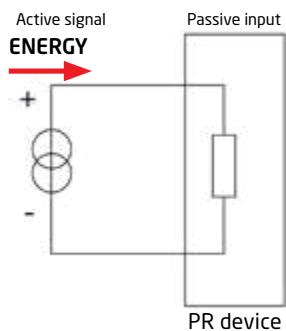


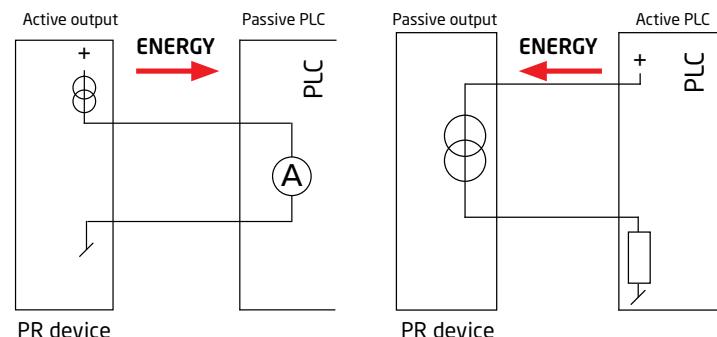
ABB
Honeywell
YOKOGAWA
PRUNIVERSAL

SIGNAL TYPES

INPUT



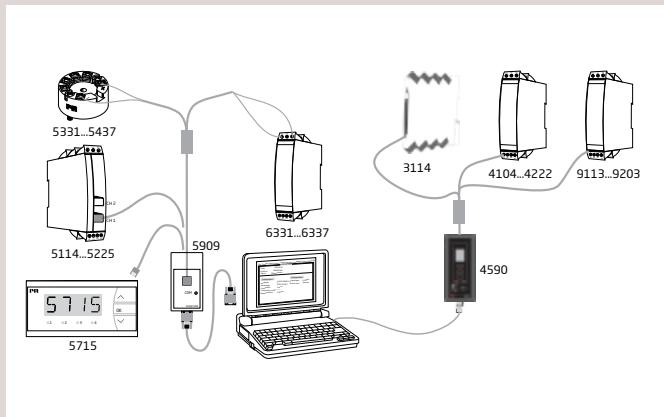
OUTPUT



PROGRAMMING UNITS



SOFTWARE



PReset

PReset is an easy-to-use menu-driven software program for set-up of PR products via a standard PC and a programming interface. PReset gives a high degree of flexibility for each product and when the menus are completed, the data is transmitted to the unit which is then ready for operation.

Loop Link 5909

Loop Link 5909 is a USB communications interface for configuration and monitoring of PR electronics' PC-programmable devices. PR devices available in the configuration program PReset ver. 5.0 or higher, can be programmed by way of Loop Link 5909.

ACCESSORIES

276USB

Viator USB HART modem

**3400T**

Electromechanical counter

**4801**

Modbus gateway

**4802**

Modbus RTU/Profinet Gateway

**5909**

Loop Link communications interface

**5910**

CJC connector, channel 1

**5910Ex**

CJC connector for I.S. / Ex devices, channel 1

**5913**

CJC connector, channel 2

**5913Ex**

CJC connector for I.S. / Ex devices, channel 2

**7002**

Spring clip

**7005**

Shunt resistor 0.1 Ω

**7006**

Shunt resistor 1 Ω

**7007**

2-digit digital potentiometer

**7008**

3-digit digital potentiometer

**7009**

10-turn potentiometer, 200 Ω

**7010**

10-turn potentiometer, 20 kΩ

**7011**

Dial for 10-turn potentiometer

**7012**

1-turn potentiometer, 1 kΩ

**7014**

Shunt resistor 0.5 Ω

**7015**

1-turn potentiometer, 10 kΩ



ACCESSORIES

7016

1-turn potentiometer, 100 kΩ

**7020**

Knob for 1-turn potentiometer

**7020A**

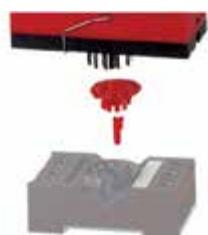
Knob for 10-turn potentiometer

**7023**

11-pole relay socket

**7024**

Code ring and code pin

**7028**

10-turn potentiometer, 2 kΩ

**7029**

Shunt resistor 0.2 Ω

**7030**

Shunt resistor 0.1 Ω for DIN rail mounting

**7031**

Label sheet with engineering units

**7400**

Pt100 temperature sensor

**7410C**

Pt100 temperature sensor

**7423**

Ceramic socket for Pt100 sensor

**7430B**

Pt100 cable sensor, Ø6 x 60 mm

**7430C**

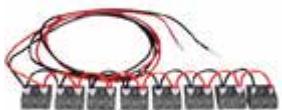
Pt100 cable sensor, Ø5 x 20 mm

**7440**

Thermowell for 7400 Pt100 sensor

**8201L**

Power wire, supply pin 31+33, left

**8201R**

Power wire, supply pin 31+33, right

**8202L**

Power wire, supply pin 31+32, left

**8202R**

Power wire, supply pin 31+32, right

**8335**

Splash-proof cover



ACCESSORIES

8341

Inductive proximity sensor, NAMUR

**8342**

Inductive proximity sensor, NAMUR

**8343**

Inductive proximity sensor, NPN

**8344**

Inductive proximity sensor, NPN

**8421**

DIN rail fitting

**8501**

Field enclosure

**8509**

M12 interface cable for 5909 Loop Link

**8510**

8 unit 4511 Modbus cable

**8511**

4511 Y-splitter Modbus cable

**8513**

RJ45 Modbus termination

**8514**

3 X RJ45 female Y-splitter

**8515**

RJ45 female to female cable adapter

**8516**

RJ45 female to female shielded cable adapter

**8517**

3 x RJ45 female shielded Y-splitter

**8550**

7501 M20 plug with silicone O-ring for alu enclosure

**8550-F**

7501 M20 plug with FKM O-ring for alu enclosure

**8550-S**

7501 M20 plug with silicone O-ring for stainless steel enclosure

**8550-SF**

7501 M20 plug with FKM O-ring for stainless steel enclosure

**8551**

7501 1/2NPT plug for alu enclosure

**8551-S**

7501 1/2NPT plug for stainless steel enclosure



ACCESSORIES

8552

Pipe-mounting bracket for 7501

**8555**

Display with LOI for 7501

**8556**

Display without LOI for 7501

**8557**

Bracket spare part for display and transmitter (for 7501)

**8558**

Bracket spare part for transmitter only (for 7501)

**9400_1**

Power rail 15 mm profile

**9400_2**

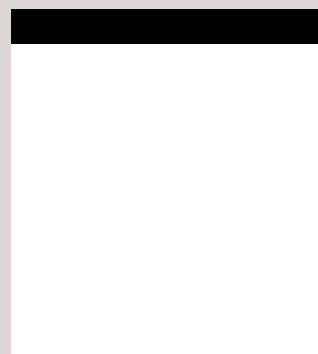
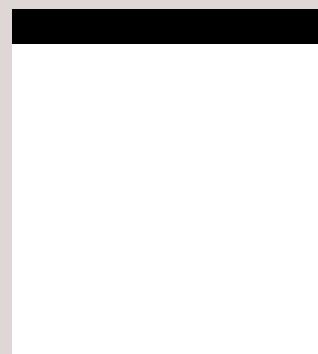
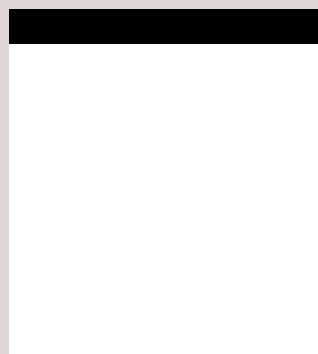
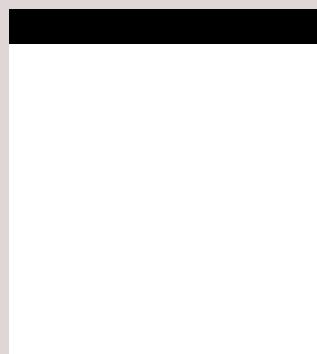
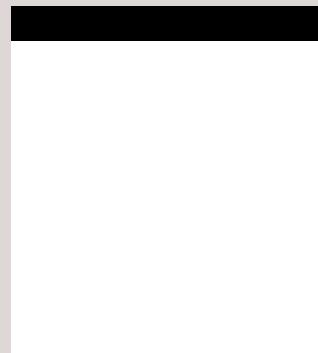
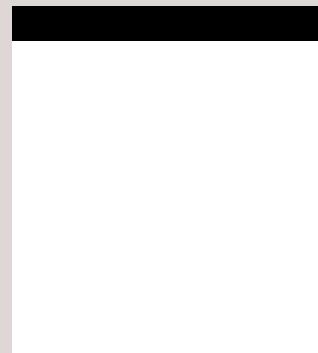
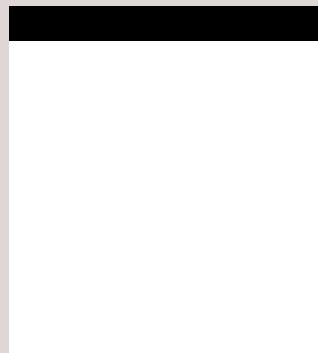
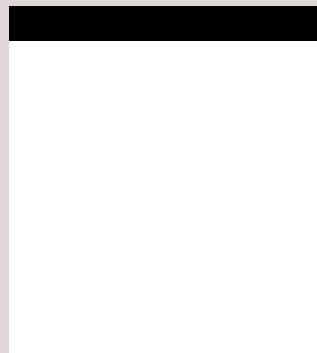
Power rail 7.5 mm profile

**9402**

Extra end covers for power rail

**9404**

Module stop for rail



POWER RAIL

The data sheet specifies the maximum required power at nominal operating values, e.g. 24 V supply voltage, 60°C ambient temperature, 600 Ω load, and 20 mA output current.

In typical applications, the devices are not running at worst-case conditions, specifically when many devices are located together. For engineering purposes, 70% (P70%) of maximum required power is often used.

3000 power rail

The number of 3000 devices that can be powered from different power sources is listed in the table below:

	Using a PR converter device as power feed-in	3405 power feed-in	9410 power feed-in
P70%	Up to 25 devices	Up to 160 devices	Up to 250 devices
P100%	Up to 18 devices	Up to 115 devices	Up to 184 devices

The devices can be stacked vertically or horizontally.

**9000 power rail**

The number of 9000 devices that can be powered from the 9400 power sources is listed in the table below:

	9410 power feed-in
P70%	Up to 150 devices
P100%	Up to 120 devices

**ENVIRONMENTAL SPECIFICATIONS**

	PR 2200 series	PR 3000 series	PR 4000 series	PR 5000 series	PR 5300 series
Specifications range	-20°C to +60°C	-25°C to +70°C (3105: 0°C to +70°C)	-20°C to +60°C	-20°C to +60°C	-40°C to +85°C
Relative humidity	< 95% RH (non-cond.)	< 95% RH (non-cond.)	< 95% RH (non-cond.)	< 95% RH (non-cond.)	< 95% RH (non-cond.)
Protection degree	IP50	IP20	IP20	IP20	IP68 / IP00
	PR 5400 series	PR 5500 / 5700 series	PR 6300 series	PR 7500 series	PR 9000 series
Specifications range	-50°C to +85°C	-20°C to +60°C	-40°C to +85°C	-20 / -40°C to +85°C	-20°C to +60°C
Relative humidity	< 99% RH (non-cond.)	< 95% RH (non-cond.)	< 95% RH (non-cond.)	0..100% RH (cond.)	< 95% RH (non-cond.)
Protection degree	IP68 / IP00	IP65 from front (5500) IP65 / Type 4X, UL50E	IP20	IP54 / IP66 / IP68 / type 4X	IP20

ENCLOSURE SPECIFICATIONS

Dimensions (mm)	Height	Width	Depth	Panel cut-out	Material
PR 2200 series	80.5	35.5	84.5+socket		Cyclooy/Noryl
PR 3000 series	113	6.1	115		Cyclooy
PR 4000 / 6000 / 9000 series	109	23.5	104		Cyclooy
PR 5000 series	109	23.5	130		Cyclooy
PR 5300 series	20.2	Ø44			Cyclooy
PR 5400 series	20.2	Ø44			Cyclooy
PR 5500 / 5700 series	48	96	120	44.5 x 91.5	Noryl
PR 7500 series	109	145	125.5		Aluminum

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Our innovative, patented technologies are derived from our expansive R&D facilities and from having a great understanding of our customers' needs and processes. We are guided by principles of simplicity, focus, courage and excellence, enabling some of the world's greatest companies to achieve PERFORMANCE MADE SMARTER.

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