PR electronics

3000 series

6 mm Series of Temperature Converters

Models no.:
3101 / 3102 / 3111 / 3112
3113 / 3331 / 3333 / 3337

No. 3000V101-UK

From ser. no 131667001

IECEx
c UL us LISTED
c FM us APPROVED
ATEX Ex
GL
DNV

DK ▶ PR electronics A/S tilbyder et bredt program af analoge og digitale signalbehandlingsmoduler til industriel automation. Programmet består af Isolatorer, Displays, Ex-barrierer, Temperaturtransmittere, Universaltransmittere mfl. Vi har modulerne, du kan stole på i selv barske miljøer med elektrisk støj, vibrationer og temperaturudsving, og alle produkter opfylder de strengeste internationale standarder. Vores motto »Signals the Best« er indbegrebet af denne filosofi – og din garanti for kvalitet.

UK ▶ PR electronics A/S offers a wide range of analogue and digital signal conditioning devices for industrial automation. The product range includes Isolators, Displays, Ex Interfaces, Temperature Transmitters, and Universal Devices. You can trust our products in the most extreme environments with electrical noise, vibrations and temperature fluctuations, and all products comply with the most exacting international standards. »Signals the Best« is the epitome of our philosophy – and your guarantee for quality.

FR ▶ PR electronics A/S offre une large gamme de produits pour le traitement des signaux analogiques et numériques dans tous les domaines industriels. La gamme de produits s'étend des transmetteurs de température aux afficheurs, des isolateurs aux interfaces SI, jusqu'aux modules universels. Vous pouvez compter sur nos produits même dans les conditions d'utilisation sévères, p.ex. bruit électrique, vibrations et fluctuations de température. Tous nos produits sont conformes aux normes internationales les plus strictes. Notre devise »SIGNALS the BEST« c'est notre ligne de conduite - et pour vous l'assurance de la meilleure qualité.

DE PR electronics A/S verfügt über ein breites Produktprogramm an analogen und digitalen Signalverarbeitungsmodule für die industrielle Automatisierung. Dieses Programm umfasst Displays, Temperaturtransmitter, Ex- und galvanische Signaltrenner, und Universalgeräte. Sie können unsere Geräte auch unter extremen Einsatzbedingungen wie elektrisches Rauschen, Erschütterungen und Temperaturschwingungen vertrauen, und alle Produkte von PR electronics werden in Übereinstimmung mit den strengsten internationalen Normen produziert. »Signals the Best« ist Ihre Garantie für Qualität!

6 MM SERIES OF TEMPERATURE CONVERTERS

3101 - 3102 - 3111 - 3112 - 3113 - 3331 - 3333 - 3337

CONTENTS

WARNING

GENERAL

To avoid the risk of electric shock and fire, the safety instructions of this guide must be observed and the guidelines followed. The specifications must not be exceeded, and the device must only be applied as described in the following. Prior to the commissioning of the device, this installation guide must be examined carefully. Only qualified personnel (technicians) should install this device. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired. Until the device is fixed, do not connect hazardous voltages to the device.

Repair of the device must be done by PR electronics A/S only.

HAZARD-OUS VOLTAGE

In applications where hazardous voltage is connected to in-/outputs of the device, sufficient spacing or isolation from wires, terminals and enclosure - to surroundings (incl. neighbouring devices), must be ensured to maintain protection against electric shock.

CAUTION

Potential electrostatic charging hazard. To avoid the risk of explosion due to electrostatic charging of the enclosure, do not handle the units unless the area is known to be safe, or appropriate safety measures are taken to avoid electrostatic discharge.

SYMBOL IDENTIFICATION

Triangle with an exclamation mark: Read the manual before installation and commissioning of the device in order to avoid incidents that could lead to personal injury or mechanical damage.

The CE mark proves the compliance of the device with the essential requirements of the directives.

Ex devices have been approved according to the ATEX directive for use in connection with installations in explosive areas.

SAFETY INSTRUCTIONS

RECEIPT AND UNPACKING

Unpack the device without damaging it. The packing should always follow the device until this has been permanently mounted. Check at the receipt of the device whether the type corresponds to the one ordered.

ENVIRONMENT

Avoid direct sunlight, dust, high temperatures, mechanical vibrations and shock, as well as rain and heavy moisture. If necessary, heating in excess of the stated limits for ambient temperatures should be avoided by way of ventilation.
Can be used in overvoltage Category II and Pollution Degree 2. The devices are designed to be safe at least under an altitude up to 2 000 m.

MOUNTING

Mounting and connection of the device should comply with national legislation for mounting of electric materials, i.e. wire cross section, protective fuse, and location. Descriptions of input / output and supply connections are shown in this installation guide and on the side label.
The device is provided with field wiring terminals and shall be supplied from a Power Supply having double / reinforced insulation. A power switch should be easily accessible and close to the device. The power switch shall be marked as the disconnecting unit for the device.
SYSTEM 3000 must be mounted on a DIN rail according to EN 60715.

UL INSTALLATION

Use 60/75°C copper conductors only.
Wire size ..... AWG 26-12
UL file number E314307
The device is an Open Type Listed Process Control Equipment. To prevent injury resulting from accessibility to live parts the equipment must be installed in an enclosure.
The power Supply unit must comply with NEC Class 2, as described by the National Electrical Code® (ANSI / NFPA 70).

CFMUS INSTALLATION IN DIVISION 2 OR ZONE 2

Class I, Div. 2, Group A, B, C, D T4 or I, Zone 2, AEx nA IIC T4 or Ex nA IIC T4.
In class I, Division 2 or Zone 2 installations, the subject equipment shall be mounted within a tool-secured enclosure which is capable of accepting one or more of Class I, Division 2 wiring methods specified in the National Electrical Code (ANSI/ NFPA 70) or in Canada in the Canadian Electrical Code (C22.1).

The 3000 System Isolators and Converters must be connected to limited output NEC Class 2 circuits, as outlined in the National Electrical Code® (ANSI / NFPA 70), only. If the devices are connected to a redundant power supply (two separate power supplies), both must meet this requirement.

Where installed in outdoor or potentially wet locations the enclosure shall at a minimum meet the requirements of IP54.

Warning: Substitution of components may impair suitability for zone 2 / division 2.

Warning: To prevent ignition of the explosive atmospheres, disconnect power before servicing and do not separate connectors when energised and an explosive gas mixture is present.

Warning: Do not mount or remove devices from the power rail when an explosive gas mixture is present.

IECEX, ATEX INSTALLATION IN ZONE 2

IECEx KEM 10.0068X..... Ex nA IIC T4 Gc
KEMA 10ATEX0147X..... II 3G Ex nA IIC T4 Gc

For safe installation the following must be observed. The device shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.

Year of manufacture can be taken from the first two digits in the serial number.

The devices shall be installed in a suitable enclosure providing a degree of protection of at least IP54 according to EN60529, taking into account the environmental conditions under which the equipment will be used.

When the temperature under rated conditions exceeds 70°C at the cable or conduit entry point, or 80°C at the branching point of the conductors, the temperature specification of the selected cable shall be in compliance with the actual measured temperature.

Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40%.

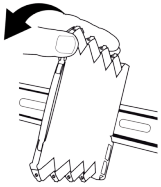
For installation on power rail in Zone 2, only Power Rail type 9400 supplied by Power Control Unit type 9410 is allowed.

To prevent ignition of the explosive atmospheres, disconnect power before servicing and do not separate connectors when energised and an explosive gas mixture is present.

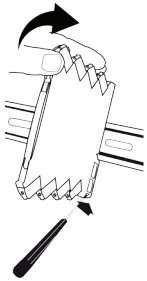
Do not mount or remove devices from the power rail when an explosive gas mixture is present.

CLEANING
When disconnected, the device may be cleaned with a cloth moistened with distilled water.

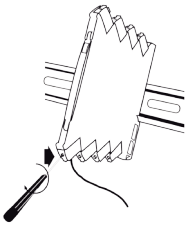
MOUNTING ON DIN RAIL



The system 3000 devices can easily be mounted on a standard 35 mm DIN rail.



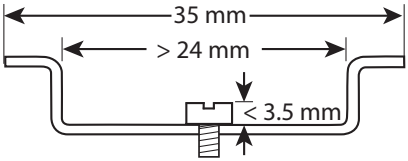
Remove the system 3000 units from the rail by lifting the DIN rail mounting clip.



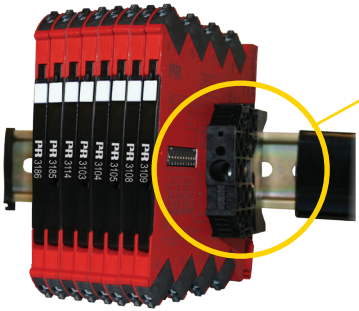
Wire size AWG 26-12 / 0.13 x 2.5 mm^2 stranded wire.
Screw terminal torque 0.5 Nm.

INSTALLATION ON DIN RAIL

To avoid short circuit between the power rail connectors on the 3111, 3112 and 3113 devices and the screws holding the 7.5 mm DIN rail, the head of the screws shall be no more than 3.5 mm high.



MODULE STOP



3000 units must be supported by module stops for marine applications.

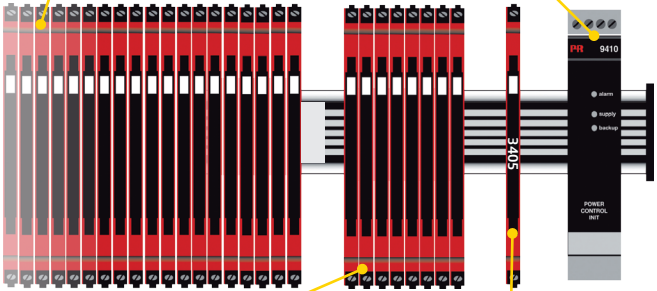
Module stop

- PR part number 9404 -

FLEXIBLE SUPPLY

Device daisy chain:
The 3101, 3102, 3111, 3112 and 3113 devices are powered by 24 VDC +/- 30%. **External protective fuse requirement: 2.5 A (*).** 2.5 A equals 60 W - this means that up to 85 units can be energized by connecting the source in parallel with the power terminals of each unit.

Power rail solution #1:
The 9410 power control unit can energize and power 96 W to the rail meaning that up to 137 pcs of 3111, 3112, 3113 units can be powered this way. Redundant power supplies are possible. **Protective fuse: Located inside the 9410.**



Power rail solution #3:
Alternately, you can connect 24 VDC to one 3111, 3112, 3113 device which will energize units on the rail. **External protective fuse requirement for powering this way: 0.4 A,** meaning that up to 10 pcs of 3111, 3112, 3113 units can be energized and powered this way.

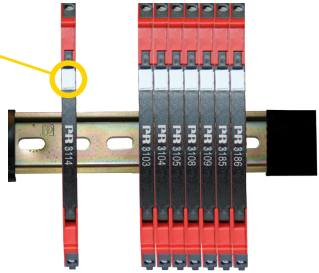
Power rail solution #2:
The 3405 power connector unit allows easy connection of a 24 VDC / 2.5 A source to the power rail. Up to 85 of the 3111, 3112, 3113 units can be powered this way. **External protective fuse: 2.5 A(*).**

(*) External fuse characteristics:
The 2.5 A fuse must break after not more than 120 seconds at 6.4 A.

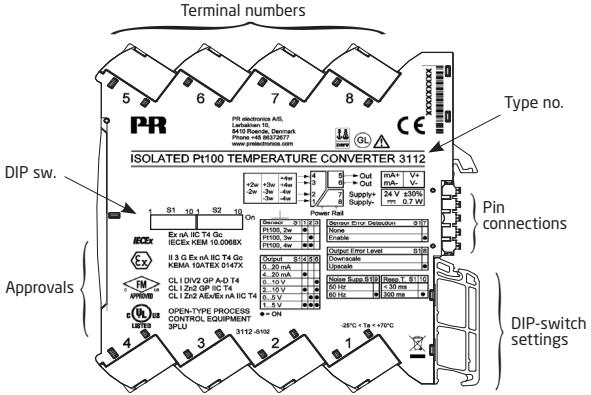
MARKING

The hinged cover of the 3000 series has a space designed to accept a snap-on marker, which can be used to identify individual units.

This space measures 5 x 7.5mm, and markers from Weidmuller's MultiCard System, type MF 5/7.5, are suitable.



SIDE LABEL



TEMPERATURE CONVERTERS

- *Converts process measurements from Pt100, TC J and K temperature sensors to voltage or current outputs*
- *Multiple pre-calibrated temperature ranges are selectable via DIP-switches*
- *High accuracy, better than 0.05% and excellent 50/60 Hz noise suppression*
- *Fast signal response time < 30 ms*
- *3113 and 3337 with HART® 7 protocol and fast signal response time < 60 ms*
- *HART® 7 protocol enables extended device programming for 3113 and 3337*
- *Slimline 6 mm housing*

Applications

- The temperature converters measure standard 2-, 3- or 4-wire Pt100 and/or TC J & K temperature sensors, and provides an analog voltage or current output.
- High 3 port isolation provides surge suppression and protects the control system from transients and noise.
- The loop powered devices have high 2-port galvanic separation to eliminate ground loops.
- The devices can be mounted in the Safe area or in Zone 2 / Division 2 areas.
- Approved for marine applications.

Technical characteristics

- High conversion accuracy, better than 0.05% of span.
- A visible green LED indicates operational status and status of the input sensor.
- All terminals are protected against overvoltage and polarity error.
- Meeting the NAMUR NE21 recommendations, the system 3000 devices ensure top measurement performance in harsh EMC environments.
- The devices meet the NAMUR NE43 standard defining out of range and sensor error output values.
- High galvanic isolation of 2.5 kVAC.
- Excellent signal/noise ratio of > 60 dB.

Mounting / installation

- Selectable DIP-mode for easy configuration of more than 1000 factory calibrated measurement ranges with HART® read only feature.
- The narrow 6 mm housing and very low power consumption allows up to 165 units to be mounted per meter of DIN rail, without any air gap between units.
- Wide temperature operation range of -25...+70°C.

Order codes:

	Input				Output			LED	Supply	Isolated	HART®
	TC			Pt100	Current		Voltage				
	J & K	Int. CJC	Ext. CJC	2-, 3-, 4-wire	Active	Passive					
3101	✓	✓			✓		✓	✓	24 VDC		
3102				✓	✓		✓	✓	24 VDC		
3111	✓	✓	✓		✓		✓	✓	24 VDC / power rail	2.5 kV	
3112				✓	✓		✓	✓	24 VDC / power rail	2.5 kV	
3113	✓	✓	✓	✓	✓			✓	24 VDC / power rail	2.5 kV	✓
3331	✓	✓	✓	✓		✓			Loop-powered	2.5 kV	
3333				✓		✓			Loop-powered		
3337	✓	✓	✓	✓		✓			Loop-powered	2.5 kV	✓

Accessories for power rail devices

Type	Function
3405	Power rail connector unit
9400	Power rail - 7.5 or 15 mm high
9404	Module stop
9410	Power connector unit
9420	Power supply

Specifications

Environmental conditions:

Specifications range	-25°C to +70°C
Storage temperature	-40°C to +85°C
Calibration temperature	20...28°C
Relative humidity	< 95% RH (non-cond.)
Protection degree	IP20 / EN60529
Installation	Pollution degree 2 and overvoltage category II

Mechanical specifications:

Dimensions (HxWxD)	113 x 6.1 x 115 mm
Weight approx.	70 g
DIN rail type	DIN EN 60715 - 35 mm
Wire size	0.13...2.5 mm^2 / AWG 26...12 stranded wire
Screw terminal torque	0.5 Nm
Vibration	IEC 60068-2-6 : 2007
2...25 Hz	±1.6 mm
25...100 Hz	±4 g

Common electrical specifications:

Supply voltage, 24 VDC nom.	16.8...31.2 VDC
Power consumption, max.	0.7 W
Loop-powered:	
3331	5.5...35 VDC
3333	3.3...35 VDC
3337	6.2...35 VDC
Isolation voltage, test	2.5 kVAC
Isolation voltage, working	300 VAC (reinforced) / 250 VAC (Zone 2, Div. 2)
Signal / noise ratio	> 60 dB
Signal dynamics, input	23 bit
Signal dynamics, output	18 bit

	Response time			
	Selectable		HART® read only mode	HART® mode
	< 30 ms	< 300 ms	< 60 ms	0.06...60 s
3101	✓	✓		
3102	✓	✓		
3111	✓	✓		
3112	✓	✓		
3113			✓	✓
3331	✓	✓		
3333	✓	✓		
3337			✓	✓

Incorrect DIP-sw setting identification:
Supplied ..... 0 V / 0 mA output; LED 0.5 s / 1 Hz
Loop-powered ..... 3.5 mA output

Accuracy - the greater of the basic and general value is valid				
Device	**Input**	**Basic accuracy**	**General accuracy**	**Temperature coefficient**
3112, 3113, 3331, 3337	Pt100	≤ 0.1°C	≤ ± 0.05% of span	0.02°C/°C (basic) or ≤ ± 0.01% of span / °C
3111, 3113, 3331, 3337	TC	≤ 0.5°C		0.1°C/°C (basic) or ≤ ± 0.01% of span / °C
3102, 3333	Pt100	≤ 0.2°C	≤ ± 0.1% of span	0.02°C/°C (basic) or ≤ ± 0.01% of span / °C
3101	TC	≤ 1°C		0.1°C/°C (basic) or ≤ ± 0.01% of span / °C

EMC immunity influence ..... < ±0.5% of span
Extended EMC immunity:
NAMUR NE 21 ..... < ±1% of span

Input specifications:

Specifications for Pt100 input:

Temperature range, Pt100 ..... -200...+850°C - IEC 60751
Sensor current..... < 150 μA
Sensor cable resistance ..... < 50 Ω per wire
Effect of sensor cable resistance, 3- / 4-wire.... < 0.002 Ω / Ω
Sensor error detection..... Yes - selectable via DIP-switch
Broken sensor detection ..... > 800 Ω
Shorted sensor detection ..... < 18 Ω

Specifications for TC input:

Temperature range, TC J..... -100...+1200°C - IEC 60584-1
Temperature range, TC K ..... -180...+1372°C - IEC 60584-1
Sensor cable resistance ..... < 5 kΩ per wire
Cold junction compensation (CJC) accuracy:
Accuracy @ external Pt100..... Better than ±0.15°C
Accuracy @ internal CJC..... Better than ±2.5°C
Open Thermocouple detection..... Yes - selectable via DIP-switch
Internal CJC error detection ..... Yes
External CJC error detection..... Yes - selectable via DIP-switch

Output specifications:

	Current output							
	Active	Passive	Selectable			NAMUR NE43		Max. load
			Invert	Range	Limit	Sensor error	Range 4...20 mA	
3101	✓			0/4...20 mA	0/3.8...20.5 mA	0/3.5/23 mA	✓	≤ 600 Ω (12.6 V / 21 mA)
3102	✓			0/4...20 mA	0/3.8...20.5 mA	0/3.5/23 mA	✓	≤ 600 Ω (12.6 V / 21 mA)
3111	✓			0/4...20 mA	0/3.8...20.5 mA	0/3.5/23 mA	✓	≤ 600 Ω (12.6 V / 21 mA)
3112	✓			0/4...20 mA	0/3.8...20.5 mA	0/3.5/23 mA	✓	≤ 600 Ω (12.6 V / 21 mA)
3113	✓			4...20 mA	3.8...20.5 mA	3.5 / 23 mA	✓	600 Ω (23 mA)
3331		✓	✓	4...20 mA	3.8...20.5 mA	3.5 / 23 mA	✓	$(V_{supply}-5.5)/0.023$ [Ω]
3333		✓	✓	4...20 mA	3.8...20.5 mA	3.5 / 23 mA	✓	$(V_{supply}-3.3)/0.023$ [Ω]
3337		✓	✓	4...20 mA	3.8...20.5 mA	3.5 / 23 mA	✓	$(V_{supply}-6.2)/0.023$ [Ω]

Updating time ..... 10 ms
Load stability..... ≤ 0.01% of span / 100 Ω

	Selectable voltage output						
	Low range			High range			Min. load
	Range	Limit	Sensor error	Range	Limit	Sensor error	
3101	0/1...5 V	0/0.875...5.125 V	0/5.5 V	0/2...10 V	0/1.75...10.25 V	0/11 V	10 kΩ
3102	0/1...5 V	0/0.875...5.125 V	0/5.5 V	0/2...10 V	0/1.75...10.25 V	0/11 V	10 kΩ
3111	0/1...5 V	0/0.875...5.125 V	0/5.5 V	0/2...10 V	0/1.75...10.25 V	0/11 V	10 kΩ
3112	0/1...5 V	0/0.875...5.125 V	0/5.5 V	0/2...10 V	0/1.75...10.25 V	0/11 V	10 kΩ

Approvals:

EMC 2004/108/EC ..... EN 61326-1
EMC Emission..... CISPR 22, Class B
LVD 2006/95/EC..... EN 61010-1
UL, Standard for Safety..... UL 61010-1
Safe Isolation..... EN 61140
GOST R

Marine:

Det Norske Veritas, Ships & Offshore..... Stand. f. Certific. No. 2.4
Germanischer Lloyd..... VI-7-2

Ex:

ATEX 94/9/EC..... KEMA 10ATEX0147X
IECEx..... KEM 10.0068X
c FM us..... 3041043-C

DIP-SWITCH CONFIGURATION

3101 and 3111 - TC J & K

Sensor	S1 1	2	3
TC J (Int. cjc)			●
TC K (Int. cjc)	●		●
TC J (Ext. cjc)		●	●
TC K (Ext. cjc)	●	●	●

Output	S1 4	5	6
0...20 mA			
4...20 mA	●		
0...10 V			●
2...10 V	●		●
0...5 V		●	●
1...5 V	●	●	●

● = ON

Sensor Error Detection	S1 7
None	
Enable	●

Output Error Level	S1 8
Downscale	
Upscale	●

Noise Supp.	S1 9	Resp. T.	S1 10
50 Hz		< 30 ms	
60 Hz	●	300 ms	●

*3101 - only int CJC

3102 and 3112 - Pt100

Sensor	S1 1	2	3
Pt100, 2w	●		
Pt100, 3w		●	
Pt100, 4w	●	●	

Output	S1 4	5	6
0...20 mA			
4...20 mA	●		
0...10 V			●
2...10 V	●		●
0...5 V		●	●
1...5 V	●	●	●

● = ON

Sensor Error Detection	S1 7
None	
Enable	●

Output Error Level	S1 8
Downscale	
Upscale	●

Noise Supp.	S1 9	Resp. T.	S1 10
50 Hz		< 30 ms	
60 Hz	●	300 ms	●

3331 - Pt100 & TC J/K

Sensor	S1 1	2	3
Pt100, 2w	●		
Pt100, 3w		●	
Pt100, 4w	●	●	
TC J (Int. CJC)			●
TC K (Int. CJC)	●		●
TC J (Ext. CJC)		●	●
TC K (Ext. CJC)	●	●	●

Output	S1 4	5	6
4...20 mA	●		
20..4 mA	●	●	

● = ON

Sensor Error Detection	S1 7
None	
Enable	●

Output Error Level	S1 8
Downscale	
Upscale	●

Noise Supp.	S1 9	Resp. T.	S1 10
50 Hz		< 30 ms	
60 Hz	●	300 ms	●

3333 - Pt100

Sensor	S1 1	2	3
Pt100, 2w	●		
Pt100, 3w		●	
Pt100, 4w	●	●	

Output	S1 4	5	6
4...20 mA	●		
20..4 mA	●	●	

● = ON

Sensor Error Detection	S1 7
None	
Enable	●

Output Error Level	S1 8
Downscale	
Upscale	●

Noise Supp.	S1 9	Resp. T.	S1 10
50 Hz		< 30 ms	
60 Hz	●	300 ms	●

3113 and 3337 - Pt100 & TC J/K + HART

Sensor	S1 1	2	3
Pt100, 2w	●		
Pt100, 3w		●	
Pt100, 4w	●	●	
TC J (Int. CJC)			●
TC K (Int. CJC)	●		●
TC J (Ext. CJC)		●	●
TC K (Ext. CJC)	●	●	●

Output	S1 4	5	6
4...20 mA	●		
20..4 mA	●	●	

● = ON

Sensor Error Detection	S1 7
None	
Enable	●

Output Error Level	S1 8
Downscale	
Upscale	●

Noise Supp.	S1 9	Config.	S1 10
50 Hz		DIP	
60 Hz	●	HART	●

(Power must be cycled after DIP-switch positions are changed).

TEMPERATURE RANGE PROGRAMMING

DIP S2 ●= ON — Temperature Range °C

Start Temp.	1	2	3	4
-200				
-180				●
-150			●	
-100			●	●
-50		●		
-25		●		●
-10		●	●	
-5		●	●	●
0	●			
5	●			●
10	●		●	
20	●		●	●
25	●	●		
50	●	●		●
100	●	●	●	
200	●	●	●	●

End Temp.	5	6	7	8	9	10
0						
5						●
10					●	
15					●	●
20				●		
25				●		●
30				●	●	
35				●	●	●
40			●			
45			●			●
50			●		●	
55			●		●	●
60			●	●		
65			●	●		●
70			●	●	●	
75			●	●	●	●
80		●				
85		●				●
90		●			●	
95		●			●	●
100		●		●		

End Temp.	5	6	7	8	9	10
105		●		●		●
110		●		●	●	
115		●		●	●	●
120		●	●			
125		●	●			●
130		●	●		●	
135		●	●		●	●
140		●	●	●		
145		●	●	●		●
150		●	●	●	●	
160		●	●	●	●	●
170	●					
180	●					●
190	●				●	
200	●				●	●
225	●			●		
250	●			●		●
275	●			●	●	
300	●			●	●	●
325	●		●			
350	●		●			●

End Temp.	5	6	7	8	9	10
375	●		●		●	
400	●		●		●	●
450	●		●	●		
500	●		●	●		●
550	●		●	●	●	
600	●		●	●	●	●
650	●	●				
700	●	●				●
750	●	●			●	
800	●	●			●	●
850	●	●		●		
900	●	●		●		●
950	●	●		●	●	
1000	●	●		●	●	●
1050	●	●	●			
1100	●	●	●			●
1150	●	●	●		●	
1200	●	●	●		●	●
1250	●	●	●	●		
1300	●	●	●	●		●
1350	●	●	●	●	●	
1372	●	●	●	●	●	●

Sens. type :	Temp. range °C :
Pt100	-200 - +850°C
TC J	-100 - +1200°C
TC K	-180 - +1372°C

Please note:

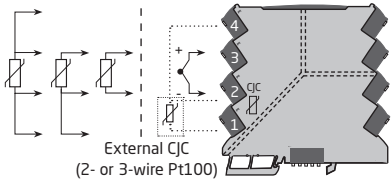
a. 3101 and 3111 - only TC input available
   Valid TC J range: -100...+1200°C = correct DIP-switch setting
   Valid TC K range: -180...+1372°C = correct DIP-switch setting
b. 3102, 3112 and 3333 - only Pt100 input available
   Valid Pt100 range: -200...+850 °C = correct DIP-switch setting
c. "Start temp" must be lower than "End temp" = correct DIP-switch setting
d. Power must be cycled after DIP-switch positions are changed

FRONT LED INDICATIONS
FOR 3101, 3102, 3111, 3112 AND 3113

LED (green)	Condition	Output	Action required
1 flash 0.5 s ON and OFF	Power-up or Restart	De-energized	-
Flashing 13 Hz / 15 ms ON	Device OK	Energized	-
Flashing 1 Hz / 15 ms ON	Sensor error indication	Up- or Downscale	Check sensor
Flashing 1 Hz / 500 ms ON	Incorrect DIP-switch setting	De-energized	Correct setting and repower
OFF	No supply / device error	De-energized	Connect supply / replace device

BLOCK DIAGRAM AND WIRING

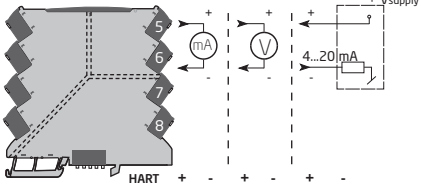
Input wiring



			+	-	CJC	Type
-	-	-	3	2	Y*	3101
1,2 & 3,4	1,2 & 3	2 & 3	-	-	N	3102
-	-	-	3	2	Y	3111
1,2 & 3,4	1,2 & 3	2 & 3	-	-	N	3112
1,2 & 3,4	1,2 & 3	2 & 3	3	2	Y	3113
1,2 & 3,4	1,2 & 3	2 & 3	3	2	Y	3331
1,2 & 3,4	1,2 & 3	2 & 3	-	-	N	3333
1,2 & 3,4	1,2 & 3	2 & 3	3	2	Y	3337

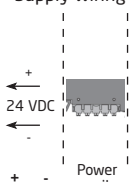
*3101 - only internal CJC

Output wiring



		HART						
3101	N	5	6	5	6	-	-
3102	N	5	6	5	6	-	-
3111	N	5	6	5	6	-	-
3112	N	5	6	5	6	-	-
3113	Y	5	6	-	-	-	-
3331	N	-	-	-	-	5	6
3333	N	-	-	-	-	5	6
3337	Y	-	-	-	-	5	6
3405	N	-	-	-	-	-	-

Supply wiring



7	8	N
7	8	N
7	8	Y
7	8	Y
7	8	Y
-	-	N
-	-	N
-	-	N
7	8	Y

3101, 3102 and 3333 - no galvanic isolation
3331 and 3337 - 2 port isolation (reinforced)
3111, 3112 and 3113 - 3 port isolation (reinforced)

Displays Programmable displays with a wide selection of inputs and outputs for display of temperature, volume and weight, etc. Feature linearization, scaling, and difference measurement functions for programming via PReset software.

Ex interfaces Interfaces for analog and digital signals as well as HART® signals between sensors / I/P converters / frequency signals and control systems in Ex zone 0, 1 & 2 and for some devices in zone 20, 21 & 22.

Isolation Galvanic isolators for analog and digital signals as well as HART® signals. A wide product range with both loop-powered and universal isolators featuring linearization, inversion, and scaling of output signals.

Temperature A wide selection of transmitters for DIN form B mounting and DIN rail devices with analog and digital bus communication ranging from application-specific to universal transmitters.

Multifunctional PC or front programmable devices with universal options for input, output and supply. This range offers a number of advanced features such as process calibration, linearization and auto-diagnosis.

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