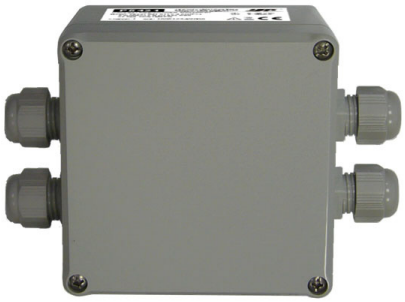
P5410, P5411, P5435
Universal Single- and Double-channels Wall Mounted Transmitters with Communication

- **Universal transmitter for all common resistance and thermocouple sensors, potentiometers.**
- **Linearized output signal 4 to 20 mA.**
- **Accuracy 0.05 %, 0.1 % or 0.15 %.**
- **Span adjustability from 0.1 to 100 %.**
- **Adjustability by field LHP or HART configurators or by program on PC and standard HART modem.**
- **Intrinsically safe version (Ex) II (1) GD.**



Application

Transmitters P54xx consist of one or two transmitters P5310, P5311 or PRetop 5335 which are built-in into plastic case from ABS material with housing IP65. Transmitters are used for conversion of a resistance or voltage temperature signal from a resistance or thermocouple temperature sensor to a linearized current loop output signal 4 to 20 mA. Transmitters P5410 do not include galvanic isolation of inputs and outputs and are suitable for resistance temperature sensors and simple systems. Transmitters P5411 and P5435 include galvanic isolation of inputs and outputs and are suitable also for applications with many measuring points and for thermocouples.

Description

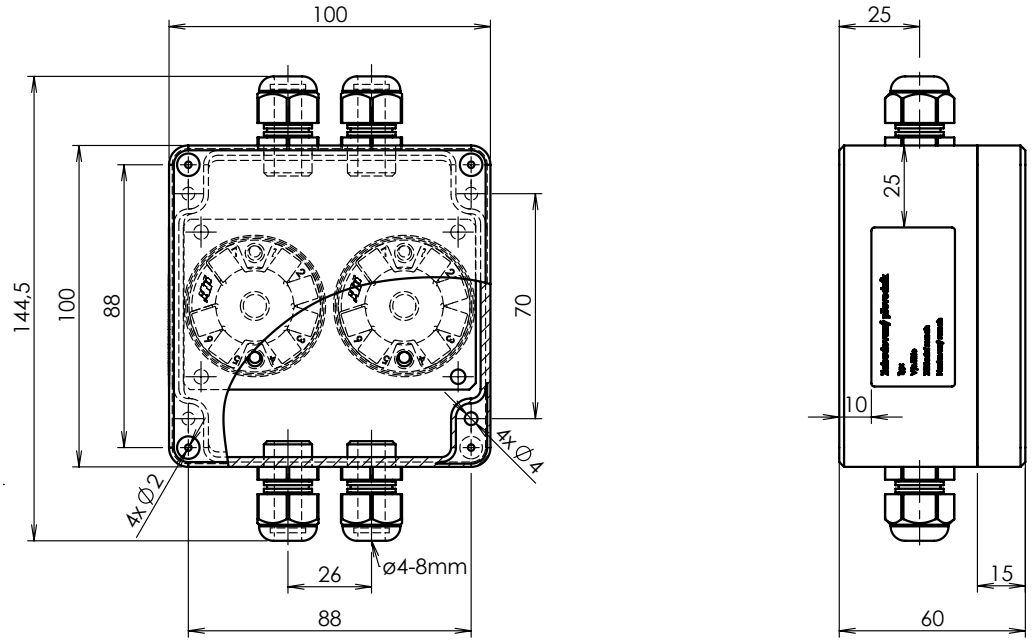
Input signals, switched over according to the input configuration are processed by an A/D transmitter and transformed into a digital signal that is transferred to a micro-computer; according to the preset configuration and after filtration of noise there are calculated all measured variables. These values are then used for calculation of the primary variable (temperature) and according to selected range, the output current is also calculated.

One resistance sensor (two-, three- or four-wire) can be connected to the input. In case of a two-wire connection, entering of a constant value of the loop resistance compensation during configuration of the transmitter can compensate the resistance of input leads. In other cases, the leads resistance is compensated automatically. A thermocouple can be also connected to the input. Temperature of the thermocouple cold junction is compensated according to configuration, either by the inner temperature sensor of terminal block, by the entered constant temperature. The inner sensor guarantees maximum accuracy and stability of cold junction temperature measurement. On special request compensation with external sensor can be supplied.

Output of the transmitter is analogue signal of the current loop 4 to 20 mA. The current output can be also used for testing of the current loop and associated apparatus. Communication is used mostly for configuration of the transmitter and is not designed for distances over approximately 10 m. P541x communicates through an own protocol LHP that is partially compatible with the protocol HART, uses the same connection, however, communication is guaranteed only for short distances and there are implemented only few commands. This interface is designed for changes of configuration. Continuous communication may influence accuracy of measurement.

Output signal of current loop 4 to 20 mA of transmitter P5435 is compatible with HART digital communication. The transmitter P5435 can be set up using standard devices for HART interface. Set up can be done for example by handheld configurator or by PC with the program LHPWinfConf and HART modem.

Dimensional drawings



Technical specification

Marking of the transmitter	P5410	P5411	P5435
Built-in transmitter	P5310	P5311	PRETOP 5335

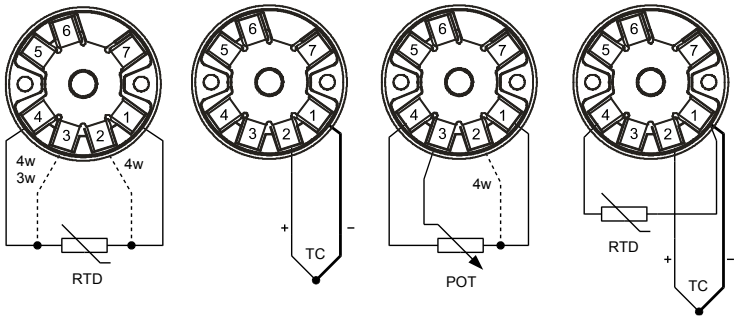
Parameter		**P5310, P5311**	**P5311 EI1**	**PRETOP 5335 A**	**PRETOP 5335 D**
Output signal		4 to 20 mA	4 to 20 mA	4 to 20 mA	4 to 20 mA
Supply voltage		9 to 35 V DC (P5310) 11 to 35 V DC (P5311)	11 to 30 V DC	8 to 35 V DC	8 to 30 V DC
Load resistance [kOhm]		$R_{obc.} = \frac{U - 11\ V}{22\ mA}$	$R_{obc.} = \frac{U - 11\ V}{22\ mA}$	$R_{obc.} = \frac{U - 12\ V}{23\ mA}$	$R_{obc.} = \frac{U - 12\ V}{23\ mA}$
Max. internal voltage Ui		-	30 V DC	35 V DC	30 V DC
Max. internal current Ii		-	100 mA	-	120 mA
Max. internal power Pi		-	0,9 W	-	0,84 W
Internal inductance Li		-	350 uH	10 uH	10 uH
Internal capacitance Ci		-	0 nF	1,0 nF	1,0 nF
Galvanic isolation	**U**	1000 V AC/ 1 min	1000 V AC/ 1 min	1500 V AC test	1500 V AC test
	I	-	-	-	-
	P	-	-	-	-
Temperature class for Ex II 1G, Ex II 1D	**T6**	-	-40 <T_{amb}< 40 °C	-	-40 <T_{amb}< 60 °C
	T5	-	-40 <T_{amb}< 55 °C	-	-40 <T_{amb}< 60 °C
	T4	-	-40 <T_{amb}< 85 °C	-	-40 <T_{amb}< 85 °C
Communication		LHP	LHP	HART, Loop Link	HART, Loop Link
Explosion protection concept (Attention! Transmitter must not be placed in potentially explosive atmospheres)		non intrinsically safe	Ex II 1G Ex ia IIC T4-T6 Ga Ex II 1D Ex ia IIIC T106°C Da	Ex II 3G Ex nA [ic] IIC T6..T4 Gc Ex II 3G Ex ic IIC T6..T4 Gc Ex II 3D Ex ic IIIC T6..T4 Dc	Ex II 1G Ex ia IIC T6 or T4 Ga Ex II 1D Ex ia IIIC Da Ex I M1 Ex ia I Ma
ATEX Certificate		-	FTZÚ 06 ATEX 0353X	KEMA 03ATEX1508X	KEMA 03ATEX1537
Warranty		3 years	3 years	5 years	5 years

For detail information, see the documentation for individual transmitters.

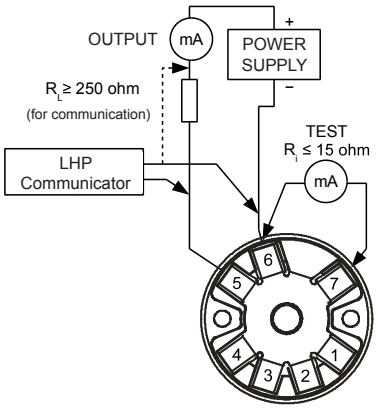
Connection of the transmitters

Connection of P5310, P5311

Input

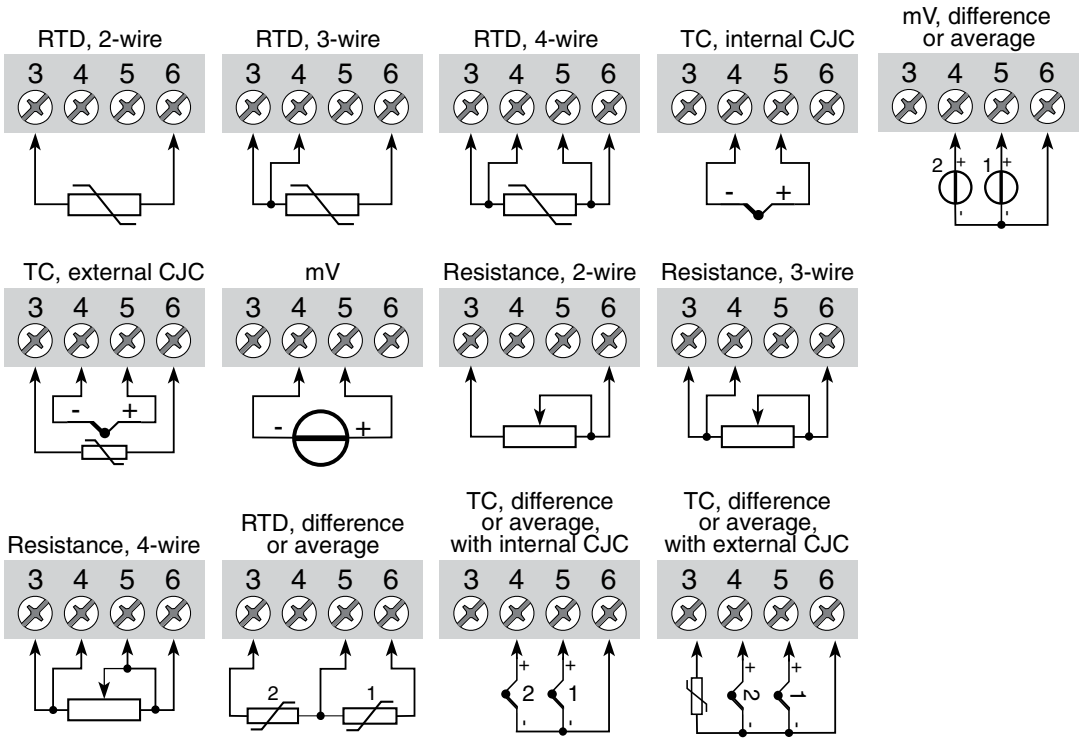


Output

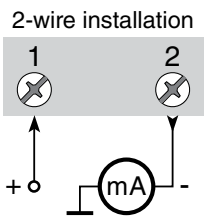


Connection of PRETOP 5335

Input



Output



	Type	Description
•	**P5410**	**Universal transmitter with LHP communication, accuracy 0.1 %, without galvanic isolation, wall mounted**
•	**P5411**	**Universal transmitter with LHP communication, accuracy 0.15 %, with galvanic isolation, wall mounted**
•	**P5435**	**Universal transmitter with HART communication, accuracy 0.05 %, with galvanic isolation, wall mounted**
	Code	**Version**
•	**S10**	**Single-channel transmitter, dimension 100x100x60 mm, housing IP 65**
•	**S20**	**Double-channel transmitter, dimension 100x100x60 mm, housing IP 65**
	Code	**Optional version**
	EI1 *	ATEX (Ex) II 1 GD [Ex ia] IIC (only P5411 and P5435, consult supplier)
	KPP5	Transmitter calibration in five points evenly distributed in setting range
•	**LHPWinCom**	**Set of configuration program LHPWinConf for PC (supported by WIN98/2000/NT/XP/Vista) and modem HARTMod**
•	**HARTWinCom**	**Set of PC configuration software HARTWinConf (CZ+EN) and modem HARTMod**
•	**HARTMod**	**Miniature HART modem with galvanic isolation**
•	**LHPConf**	**Field configurator for LHP transmitters, function of transmitter supply, without charging**
•	**HARTConf**	**HART-USB modem and field communicator for LHP and HART transmitters, function of transmitter supply supplied from USB or inbuilt accumulator, charged from USB**
•	**LHPWinConf**	**Configuration software LHPWinConf (CZ+EN) for PC (WIN98/2000/NT/XP/Vista)**
•	**USB-RS232C**	**Communication interface for to USB port of the PC**
•	**PT1000A**	**Compensation resistor Pt1000 (-30 to +150 °C) for external compensation of thermocouple**
•	**8444**	**Program PReset (CD-ROM)**
	Example of order: P5435 S10 NR HARTConf	

• ... Ex stock version

* …Transmitter must not be placed in potentially explosive atmospheres. In a potentially explosive atmosphere can only lead input and output wires