

Differential Pressure Transmitter



masibus
A Sonepar Company

Masibus Automation and Instrumentation Pvt. Ltd.

SPECIFICATION

INPUT	
Input Type	Differential Pressure
Measurement Range	Pa: +/- 100, 250, 500, 1000, -1999 to 4000 or Unidirectional mmWC: +/- 10, 25, 50, 100, -199 to 400 or Unidirectional
Accuracy	Pa : +/- 0.5% Span +/- 2 Pa mmWC : +/- 0.5% Span +/- 0.2 (including: general accuracy, temperature drift, linearity, hysteresis, and repetition error)
Resolution	0.1 / 1 selectable in measured units
Response Time	2 sec
Thermal effects	Temperature compensated across the full spectrum of capability
Overpressure	Proof pressure: +/- 10 kPa Burst pressure: +/- 20 kPa
Zero point calibration	Manual by Front Keypad (Available in device with display) / PC based software
Digital Filter	0 to 100 Sec

DISPLAY & KEYS	
Process Value	4 digit, 7 - segment 0.39" LCD
Keys	Push Button: ENT, ESC, INC for Configuration and Calibration

OUTPUT (for Loop Power Model)	
No. of Output	1
Signal	4-20mA (direct or reverse user configurable)
Accuracy	±0.1% of FS
Temperature co-efficient	≤100 ppm
Load	Rload = ((Loop Supply Voltage - 10) / 0.021) Ohm
Sensor Break Output	≤3.6 or ≥21mA

COMMUNICATION		
Model	Loop Powered	Aux. Powered
Interface	TTL	RS485
Protocol	Modbus RTU	
Baud Rate	4800, 9600, 19200 bps	

POWER SUPPLY	
Loop Powered Model	10 to 36 VDC with Reverse Polarity Protection
Aux Powered Model	18 to 36 VDC with Reverse

	Polarity Protection. <1W Power Consumption.
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ISOLATION	
Aux Powered Model	1000Vrms for 1 minute between Supply and RS485 Output

PHYSICAL	
Mounting	Wall Mount
Weight	~200g
Enclosure Dimension (in mm)	80mm(H)x82mm(W)x55mm(D)
Enclosure Material	ABS
IP (Ingress Protection)	IP-65
Cable Entry Gland	PG 7
Cable Terminal Type	2.5 mm ² , AWG 14 Wire, Screw Type
Tubing	PVC

ENVIRONMENTAL	
Operating temperature	0 to 60°C
Storage temperature	-10° to 70°C
Humidity	20% to 90% RH (Non-Condensing)
Warm up time	Approx. 15 min.

SAFETY/WARNING PRECAUTIONS

To avoid Electrostatic Discharge (ESD) to the transmitter, that may cause permanent damage, Operator must operate device using ESD safe tools and clothing.

Terminal wiring:

Check that all cables are correctly connected according to the connection diagram. Before installation or beginning of any troubleshooting Procedures, the power to all equipment must be turned off and isolated. Units suspected of being faulty must be Disconnected and removed first and brought to a properly equipped workshop for testing and repair.

Component replacement and internal adjustments must be done either by Masibus or done under the guidance of Masibus. Wiring must be carried out by skilled personnel and correct tools.

All wiring must confirm with standards of good practice and local codes and regulations. Wiring must be suitable for voltage, current, and temperature rating of the system. Beware not to over-tighten the terminal screws.

WARRANTY

Warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification.

Masibus is not liable for special, indirect or consequential damages or for loss of profit or for expenses sustained as a result of a device malfunction, incorrect application or adjustment.

Masibus total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

MECHANICAL INSTALLATION AND REMOVAL

DPT7S10 transmitter is available in wall mounting and duct mounting. Wall Mount clamps are also included with kit.

WALL MOUNT:

With mounting clamps (Provided) attach the wall assembly plate to the wall with two screws.

CALIBRATION PROCEDURE

The instrument is factory calibrated for the specified range of Differential pressure input PV, but due to long term drift of components, re-calibration may be necessary in some cases. For calibrating the instrument, a reliable source is required. This source should be at least ten times accurate compared to the range of the instrument.

The unit can be calibrated without opening it and without trim pots. While calibration from Modbus please set flag to 1 on address 40019, and set it to 0 after done calibration.

40019 - Calibration mode flag:

- 0- Run Mode
- 1- Cal mode

Procedure for calibration zero and span of pressure sensor
To calibrate DPT7S10 for Digital sensor, zero calibration, span point 1 calibration and span point 2 calibration are required.
Zero calibration: The value should be calibrated to zero only.

Example: if process value is 0.4, then calibrate that value to 0.0

Note: For zero calibration Disconnect both pressure tubes from the pressure ports labelled + and -.

Span Point 1 Calibration: It can be done either at positive side or negative side.

Example:

- 0 to 125 Pa. 0 means zero calibration and 125 means span point 1 calibration.
- 0 to -125 Pa. 0 means zero calibration and -125 means span point 1 calibration.

Span Point 2 Calibration: It can be done at positive side only.

Example: 0 to 250 Pa. 0 means zero calibration and 250 means span point calibration. To enter into the Calibration Mode, please refer Menu Layout. Apply appropriate Input from the source, and press 'INCREMENT KEY' for calibration until decimal point of digit 3 of PV starts to blink. It indicates calibration is start.

MODBUS CALIBRATION:

Calibration of pressure sensor input with Modbus RTU.

Example:

To calibrate pressure input:

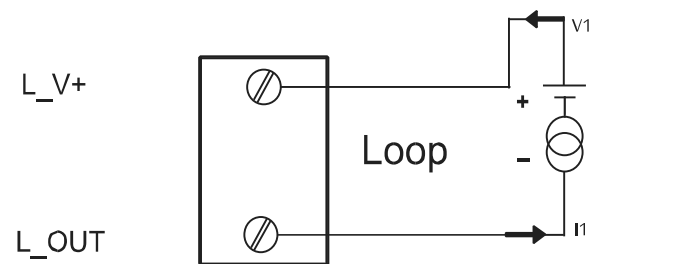
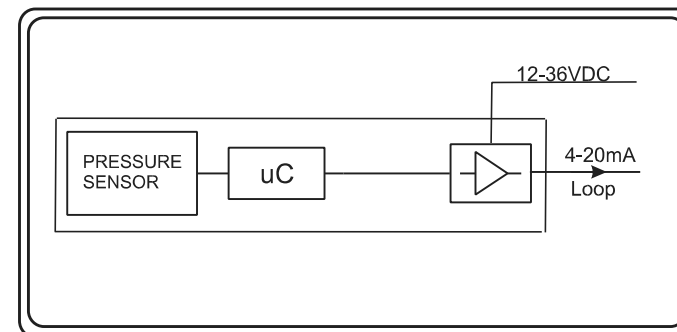
Set value of zero point on Modbus holding register 40019.

Set value of span point 1 on Modbus holding register 40020.

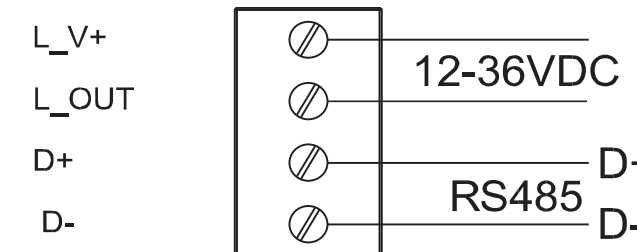
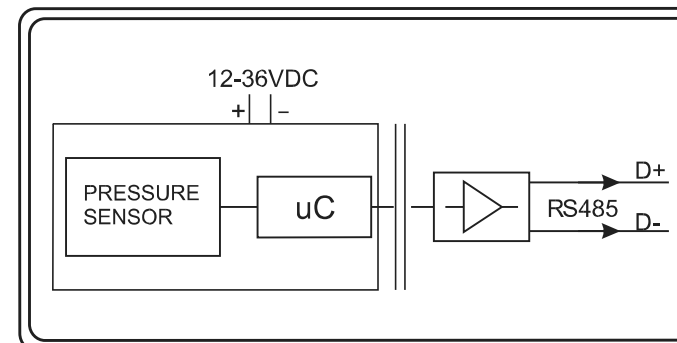
Set value of span point 2 on Modbus holding register 40021.

Now to calibrate zero point write "1", to calibrate span point 1 write "2", to calibrate span point 2 write "3" on Modbus holding register 40019. And to come in run mode from calibration write "0" on Modbus holding resistor 40019.

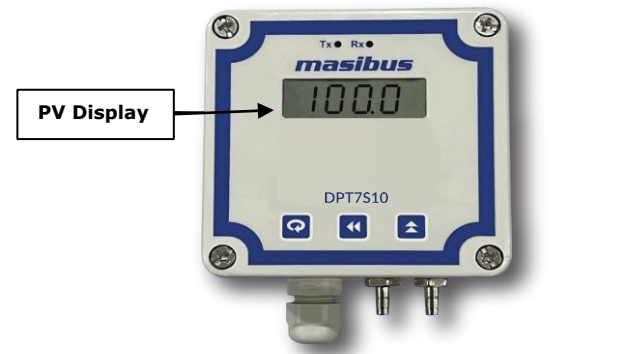
DPT7S10 Block Diagram and Terminal Connection Loop Power Model



Aux Power RS485 Model



PARAMETER SETTINGS



- ENT KEY
- ESC/SHIFT KEY
- UP/INC KEY

Menu Parameter Description

Display	Name	Description
PRS Mode		
LRNG (Lrng)	Pressure Low range	It is a pressure Low range and pressure high range for display. 0.1 degree Resolution - 50.0/-100.0 to 50.0/100.0 For mmWC -500.0/-1000 to 500.0/1000 For Pa 1 degree Resolution -50/-100/-199 to 50/100/400 For mmWC -500/-1000/-1999 to 500/1000/4000 For Pa *Note: LRNG should be always less than HRNG
HRNG (Hrng)	Pressure High range	
DP (dP)	Decimal point	To Set position of Decimal Point on ProcessValue. 0 : 0 1 : 00.0 (not available for 4000 range)
UNIT (Unit)	Unit	Configure the Engineering Unit for Process Value. 0: mmWC 1: Pa
RANG (rAng)	Range	0: UNDR (unidirectional) 1: BIDR (bidirectional)
OFST (oFSt)	Offset	To add offset in actual pressure ProcessValue
PRSL (PrSl)	Pressure low limit	For pressure low limit in actual pressure This mode is not applicable in BIDR (bidirectional)
F.IIR (F.iir)	filter	It is a filter rate for IIR filter, 0 value will disable the Filter. Set value from 0-100sec
F.AVG (F.aVg)	Moving Average Filter Option	For enable or disable Moving Average Filter. 0: Off 1: On
RTR Mode		
OPLO (oPLo)	Output Low	O/P Low value limit will be limited between 0-25% of output. Output will not be scaled but will be limited to configured % of output.
OPHI (oPHi)	Output High	O/P Hi value limit will be limited between 75-100 % of output. Output will not be scaled but will be limited to configured % of output.
OPSE (oPSE)	OPEN Sensor	To set O/P to either Upscale or Downscale when Input is OPEN. 0: up 1: dn
DIR (dir)	Output Direction	To set Retransmission O/P Direction to either Direct or Reverse. 0: dir 1: rev
COM Mode		
SRNO (Srno)	Serial No.	Sr. No. for communication(1 to 247)

baud (bRUD)	Baud Rate	Set Serial Communication Baud Rate 0 : 4800 bps 1 : 9600 bps 2 : 19200 bps
ADV Mode		
FSET (F5Et)	Factory reset	To retrieve the factory setting. 0: Para 1: Cal
PASS (PR55)	Change Password	To change the Password of device to Enter in Menu Mode.
TOUT (tout)	Time out	Time Setting to Return in RUN mode from any mode while no key operation. Timeout Range is between 10 to 300 seconds.
ver (uEr)	Version No.	Shows the Version of the Current Firmware.
ICAL Mode		
PC-Z (Pc-z)	Pressure calibration - ZERO point	Pressure calibration - zero for PV input pressure.
PCS1 (PcS1)	Pressure calibration - Set point 1	Pressure calibration span point- 1 for PV input pressure
PCS2 (PcS2)	Pressure calibration - Set point 2	Pressure calibration span point- 2 for PV input pressure
PCP1 (PcP1)	Pressure calibration point 1	To Set the calibration point-1.
PCP2 (PcP2)	Pressure calibration point 2	To Set the calibration point-2.
OCAL Mode		
ZERO (ZEra)	Calibration Zero	Calibration Zero for output loop.
SPAN (SPAn)	Calibration Span	Calibration Span for output loop.


40001. Unit 0. mmWC 1. Pa	40008. FavG 1. ON 0. OFF
40011. OPEN SENSOR 0. UPSC 1. DN	40012. DIRECTION 0. DIR 1. REV
40014. BAUD RATE 0. 4800 1. 9600 2. 19200	40015. FACTORY RESET 0. Para 1. Cal
40019. i/p Calibration of PC-Z, PCS1 and PCS2 0. No calibration 1. Zero point calibration 2. PCP1 calibration 3. PCP2 calibration	40022. o/p calibration 0. No calibration 1. Zero calibration 2. Span calibration

Unit	Input Cal. Range for Modbus
Pa	-500 to 500 / -1000 to 1000 / -1999 to 4000
mmWC	-50 to 50 / -100 to 100 / -199 to 400

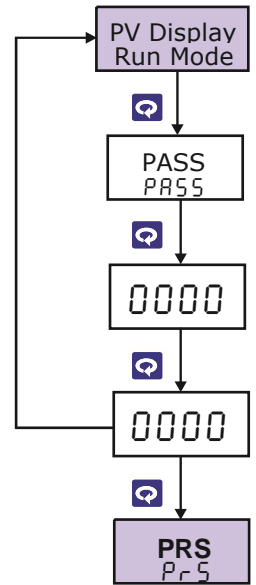
MODBUS Parameters Details:

Analog Parameters	Address	Type of Access	Parameter Type	Values Applicable
Process value pressure	30001	Read	Int	-
Unit for pressure	40001	Read/write	Int	0-1
DP for pressure	40002	Read/write	Int	0-1
High rang for pressure	40003	Read/write	Int	For Pa: -500 to 500 / -1000 to 1000 / -1999 to 4000 For mmWC: -50 to 50 / -100 to 100 / -199 to 400
Rang for pressure	40004	Read/write	Int	0-1
Offset for pressure	40005	Read/write	Int	-10 to 10
Pressure low limit for pressure	40006	Read/write	Int	0 to 10
IIR Filter for Pressure	40007	Read/write	Int	0 to 100
F-average for pressure	40008	Read/write	Int	0-1
Output low for loop	40009	Read/write	Int	0-25
Output high for loop	40010	Read/write	Int	75-100
Open sensor for loop	40011	Read/write	Int	0-1
Direction for loop	40012	Read/write	Int	0-1
Serial No.	40013	Read/write	Int	0-247
Baud rate	40014	Read/write	Int	0 to 2
Factory reset	40015	Read/write	Int	0 to 1
Password	40016	Read/write	Int	0 To 9999
Timeout	40017	Read/write	Int	10-300 sec
Version	40018	Read	Int	1
Calibration of PC-Z, PCS1 and PCS2	40019	Read/write	Int	0 to 3
Pressure calibration point-1	40020	Read/write	Int	125
Pressure calibration point-2	40021	Read/write	Int	250
Loop calibration output selection (zero calibration (1), Span calibration (2), Exit from calibration (0)).	40022	Read/write	Int	0 to 2
Output zero calibration	40023	Read/write	Int	3000 to 5000
Output span calibration	40024	Read/write	Int	19000 to 21000
Low rang for pressure	40025	Read/write	Int	For Pa: -500 to 500 / -1000 to 1000/ -1999 to 4000 For mmWC: -50 to 50 / -100 to 100 / -199 to 400

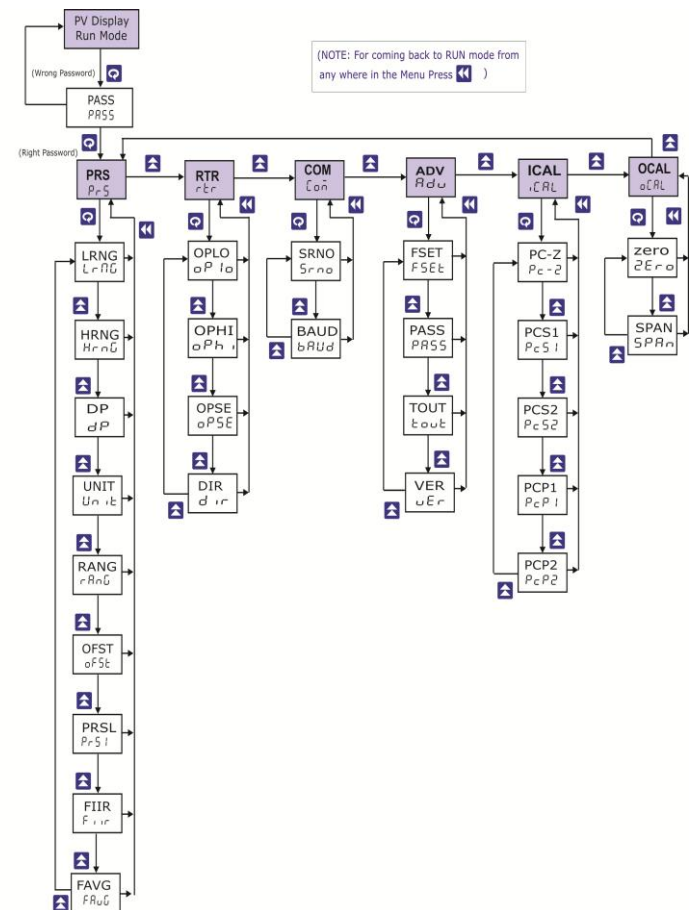
*Note: LRNG should be always less than HRNG
*Dp 1 is not available in 4000 Range.



(NOTE: For coming back to RUN mode from anywhere in the Menu Press )

EXAMPLE CODE FOR SET THE PASSWORD



MENU LAYOUT FOR DPT7S10



(NOTE: For edit value press 
For shift digit press )

- Process Value of device will show "over" when process value is higher than 5% of individual span. At that time Device will send '32766' by Modbus to PC.

TROUBLE SHOOTING

O/P mA Fault:
Check the transmitter output connections. Check the connection between the sensor and the transmitter.

O/P mA Not Matching to the Required Value
If a reference sensor is available check it with the transmitter working correctly or not. If there is calibration doubt, apply known values of Calibration and check the Output accordingly. If still problem persist contact Masibus.



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