



# 105 Series

## 105 Series

### PRESSURE, VACUUM, DIFFERENTIAL PRESSURE, TEMPERATURE SWITCHES

#### FEATURES

- Epoxy Coated Enclosure and Stainless Steel Component Parts
- SPDT Switch Output
- Terminal Block Wiring
- Adjustable Ranges:
  - Pressure: 30 "Hg Vac to 200 psi (-1 to 13,8 bar)
  - Differential pressure: 0 to 100 psid (0 to 6,9 bar)
  - Temperature: -120 to 640 °F (-85 to 335 °C)
- Heat Trace and Freeze Protection Models



### OVERVIEW

Designed to meet the demanding temperature and pressure requirements of the power and process industries, the 105 Series meets classification for watertight, dust-tight and corrosion resistant construction.

The 105 Series features an externally-accessible set point dial, isolated from the wiring compartment, for easy setting after wiring. A stainless steel cover protects the adjustment from inadvertent changes. A terminal block provides convenient wiring.

Successful applications include power utilities, compressors, heat trace, freeze protection and chemical processes.

### FEATURES

- External dial with gasketed, stainless steel, tamper resistant dial cover

- SPDT switch output

- Terminal block wiring

- Adjustable ranges:

Pressure: 30 "Hg VAC to 200 psi (-1 to 13,8 bar)

Differential Pressure: 0 to 100 psid (0 to 6,9 bar)

Temperature: -120 to 640°F (-85 to 335°C)



## SPECIFICATIONS

<b>STORAGE TEMPERATURE</b>	-65° to 160°F (-54 to 71 °C)
<b>AMBIENT TEMPERATURE LIMITS</b>	-40° to 160°F (-40 to 71 °C); set point typically shifts less than 1% of range for a 50°F (28°C) ambient temperature change
<b>SET POINT REPEATABILITY</b>	± 1% of adjustable range
<b>SHOCK</b>	Set point repeats after 15 G, 10 millisecond duration
<b>VIBRATION</b>	Set point repeats after 2.5 G, 5-500 Hz
<b>ENCLOSURE</b>	Die cast aluminum (max 0.6% copper); epoxy powder coated; gasketed stainless steel tamper-resistant dial screws
cover; captive cover	
<b>ENCLOSURE CLASSIFICATION</b>	Designed to meet NEMA 4X requirements
<b>SWITCH OUTPUT</b>	One SPDT; switch may be wired "normally open" or "normally closed"
<b>ELECTRICAL RATING</b>	15 A 125/250/480 VAC resistive
<b>WEIGHT</b>	Approx. 2 lbs., 4 oz. (1,02 kg.)
<b>ELECTRICAL CONNECTION</b>	1/2" NPT female
<b>PRESSURE CONNECTION</b>	1/4" NPT female; models S126B-S164B: 1/2" NPT female
<b>TEMPERATURE ASSEMBLY</b>	Bulb and capillary: 6 feet 304 stainless steel Immersion stem: model 13270: 304 stainless steel; models 120 & 121: nickel-plated brass
<b>FILL</b>	Non-toxic oil filled
<b>TEMPERATURE DEADBAND</b>	Typically 2% of range under laboratory conditions (70°F ambient circulating bath at rate of 1/2°F per minute change)
<b>HEAT TRACING OR FREEZE PROTECTION</b>	Thermostats designed specifically for heat tracing and freeze protection (ambient sensing) applications are available with types B105 and E105; specifications are the same as above B105-13270 includes: E/R: 22 A/480 VAC switch; type 13271 includes: 22 A/480 VAC switch and 10 steel capillary (see page 5)
except: type E105- feet of stainless	

## APPROVALS



### UL listed

Temperature: UL 873, file # E10667

Pressure: UL 508, file # E42272

### CSA certified

Temperature: C22.2 no. 24, file # LR7814

Pressure: C22.2 no. 14, file # LR39690

CE Compliance to Low Voltage Directive (LVD)

## PRESSURE MODEL CHART

Model	Stock #	Adjustable Set Point Range		Deadband		Proof Pressure		Dial Division	Over Range Pressure	
		psi	bar	psi	bar	psi	bar		psi	bar

### H105

Welded 316L stainless steel bellows with 1/2" NPT female pressure connection

S126B	—	30 "Hg VAC to 0 psi	-1 to 0	0.2 to 0.8 "Hg	0,007 to 0,03	5	0,34	1/2 "Hg	0	0
S134B	—	30 "Hg VAC to 20 psi	-1 to 1,38	0.2 to 1 "Hg	0,007 to 0,0325	25	1,72	1 "Hg & 1/2 psi	20	1,4
S137B	—	2 to 80 "wc	0,01 to 0,20	4 to 6 "wc	0,01 to 0,015	5	0,34	2 "wc	80 "wc	200 m bar
S144B	—	0 to 20	0 to 1,38	0.1 to 0.3	0,01 to 0,02	25	1,72	1/2	20	1,4
S146B	—	0 to 30	0 to 2,07	0.1 to 0.4	0,01 to 0,03	40	2,76	1/2	30	2
S156B	9645	0 to 100	0 to 6,90	0.2 to 0.8	0,01 to 0,06	125	8,62	2	100	6,9
S164B	—	0 to 200	0 to 13,79	0.3 to 1.2	0,02 to 0,08	200	13,79	5	200	13,7

Brass bellows with 1/4" NPT female nickel plated brass; models 126 & 134 have zinc-plated steel spring in media

126	9520	30 "Hg VAC to 0 psi	-1 to 0	0.2 to 0.8 "Hg	0,007 to 0,03	5	0,34	1/2 "Hg	0	0
134	—	30 "Hg VAC to 20 psi	-1 to 1,38	0.2 to 1 "Hg	0,007 to 0,03	25	1,72	1 "Hg & 1/2 psi	20	1,4
137	—	2 to 80 "wc	0,01 to 0,20	4 to 6 "wc	0,01 to 0,015	5	0,34	2 "wc	80 "wc	200 m bar
144	—	0 to 20	0 to 1,38	0.1 to 0.3	0,01 to 0,02	25	1,72	1/2	20	1,4
146	—	0 to 30	0 to 2,07	0.1 to 0.4	0,01 to 0,03	40	2,76	1/2	30	2
156	9569	0 to 100	0 to 6,90	0.2 to 0.8	0,01 to 0,06	125	8,62	2	100	6,9
164	—	0 to 200	0 to 13,79	0.3 to 1.2	0,02 to 0,08	200	13,79	5	200	13,7

### H105K Differential Pressure

### Working Pressure

mbar    psi    bar

psi    bar

Buna N diaphragm and O-ring with 1/4" NPT female aluminum pressure connection

455	9971	5 to 80 "wcd	12 to 200 m bar	1 to 4 "wc	2,5 to 10	225	15,51	2 "wc	30 "Hg VAC to 225	-1 to 15,51
456	—	2 to 20 psid	0.14 to 1,38	0.05 to 0	7,0 to 20	225	15,51	0.5	30"Hg	
		VAC to 225	-1 to 15,51							
457	—	3 to 30 psid			0.21 to 2,07	0.05 to 0.3	7,0 to 27	225		
15,51	1		30 "Hg VAC to 225	-1 to 15,51						

Teflon® and Buna N diaphragms, Buna N O-ring with 1/4" NPT female aluminum pressure connections

## TEMPERATURE MODEL CHART

Model	Stock #	Adjustable Range		Max. Temperature		Scale Division		Bulb Size		
		°F	°C	°F	°C	°F	°C	OD x Length		
559	—	10 to 100psid	0.7 to 6,90	0.2 to 0.8	14 to 68	225	15,51	2	30 "Hg VAC to 225	-1 to 15,51
<b>E105</b>										
2BSB	—	-120 to 100	-85 to 35	150	65	5	5	3/8 x 2 5/8"		
5BS	9041	-20 to 80	-30 to 25	130	55	2	2	3/8 x 5"		
4BS	—	25 to 100	-5 to 35	150	65	2	1	3/8 x 6 3/4"		
2BSB	9020	30 to 250	0 to 120	300	150	5	5	3/8 x 2 5/8"		
3BS	9027	100 to 400	35 to 200	450	230	5	5	3/8 x 2 1/8"		
8BS	—	350 to 640	175 to 335	690	365	5	5	3/8 x 3 1/4"		
HTFP	13271	25 to 325	-5 to 165	360	182	5	5	1/4 x 11 5/8"		
(Heat Tracing)										
<b>B105</b>										
<b>Stem Size</b>										
120	9410	0 to 225	-15 to 105	275	135	5	5	9/16" x 1 7/8" below thread (nickel-plated brass)		
121	9424	200 to 425	95 to 215	475	245	5	5	9/16" x 1 7/8" below thread (nickel-plated brass)		
HTFP	13270	15 to 140	-10 to 60	160	71	—	—	9/16" x 2 11/16" (stainless steel)		
(Freeze Protection)										

Teflon is a registered trademark of E.I. DuPont.

## HOW TO ORDER

### BUILDING A PART NUMBER

#### Select a Type

Refer to the "Type" section below. Determine type number based on switch output, enclosure, adjustment and reference.

Fill in the type portion of your part number with the corresponding number.

#### Select a Model

Refer to the "Model Charts". Determine model or stock number based on adjustable range, deadband and proof pressure.

Fill in the model portion of your part number with the corresponding number.

#### Select an Option

Refer to the "Options" section. Determine option number based on switch output, optional materials or other product enhancements.

Fill in the option portion of your part number with the corresponding number. Leave "option" portion blank if no options are needed.

*FOR MULTIPLE OPTIONS:* Call United Electric Controls.

### TYPE

### DESCRIPTION

Pressure	Type H105 – One SPDT; epoxy coated enclosure; external adjustment with reference dial
Differential Pressure	Type H105K – One SPDT; epoxy coated enclosure; external adjustment with reference dial
Temperature	Type B105 – Immersion stem; one SPDT; epoxy coated enclosure; external adjustment with reference dial Type E105 – Bulb and capillary; one SPDT; epoxy coated enclosure; external adjustment with reference dial

### SWITCH OPTIONS

0140	Gold contacts, 1 A 125 VAC resistive
0500	Close deadband, 5 A 125/250 VAC resistive
1070	10 A 125 VDC resistive; deadband and minimum set point will increase
1520	Adjustable deadband, 15 A 125/250/277 VAC resistive; adjustable wheel changes rise setting only; if adjustment on fall is required use primary adjustment. NOT AVAILABLE TYPES B AND E
1535	High ambient, 15 A 125/250 VAC resistive; temperatures up to 250°F (145°C)
2000	20 A 125/250 VAC resistive

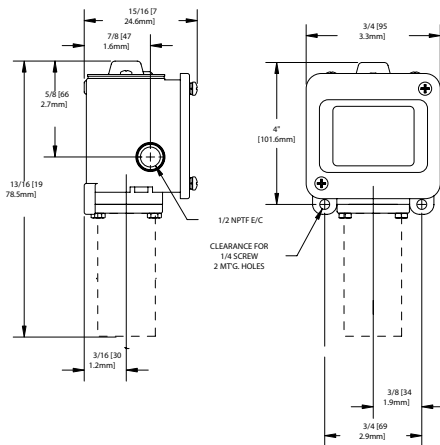
### OTHER OPTIONS

M201	Factory set one switch; specify increasing or decreasing pressure or temperature and set point
M276	Range indicated on nameplate in bars/mbars. NOT AVAILABLE TEMPERATURE VERSIONS
M278	Range indicated on nameplate in Kg/cm <sup>2</sup> . NOT AVAILABLE TEMPERATURE VERSIONS
M444	Paper ID tag
M446	Stainless steel ID tag & wire attachment
M504	316L Stainless steel immersion stem. AVAILABLE MODELS 120, 121
M540	Viton® construction; wetted parts include Viton® diaphragm and O-ring plus standard connection materials (Deadbands and low end of range may increase slightly. Consult factory). AVAILABLE MODELS 455-457
M550	Oxygen service cleaning; internal construction may change

# DIMENSIONAL DRAWINGS

## EXTERNAL SET POINT ADJUSTMENT

Types H105, H105K, B105, E105

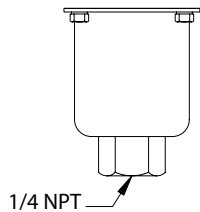


Models	Dimension A		
	Inches	mm	NPT
<b>Pressure</b>			
126-164	6.56	165,89	1/4
S126B-S164B	6.94	176,21	1/2
<b>Differential Pressure</b>			
455-559	7.75	196,85	1/4
<b>Temperature</b>			
120-121	8.38	212,73	Immersion Stem
2BSA-8BS, 13271	8.69	220,73	Bulb & Capillary
13270	8.50	215,9	Immersion Stem

All dimensions stated in inches (mm)

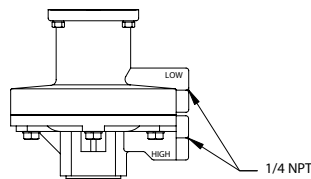
### PRESSURE SENSORS

Models 126-164



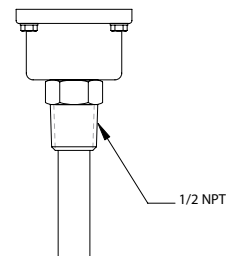
### DIFFERENTIAL PRESSURE SENSORS

Models 455-559

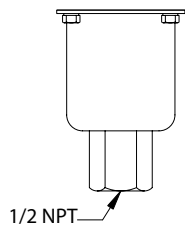


### TEMPERATURE SENSORS

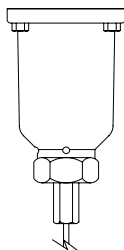
Models 120-121



Models S126B-S164B



Models 2BSA-8BS, 13271





## RECOMMENDED PRACTICES AND WARNINGS

United Electric Controls Company recommends careful consideration of the following factors when specifying and installing UE pressure and temperature units. Before installing a unit, the Installation and Maintenance instructions provided with unit must be read and understood.

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum temperature is acceptable on a limited basis (i.e., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. Orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- For all applications, a factory set unit should be tested before use.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- Use only factory authorized replacement parts and procedures.
- Do not mount unit in ambient temp. exceeding published limits.

## LIMITED WARRANTY OF REPAIR AND REPLACEMENT

Seller warrants that the product hereby purchased is, upon delivery, free from defects in material and workmanship and that any such product which is found to be defective in such workmanship or material will be repaired or replaced by Seller (F.O.B. UE Watertown); provided, however, that this warranty applies only to equipment found to be so defective within a period of 18 months from the date of manufacture by the Seller (36 months for the Spectra 12 and One Series products). Seller shall not be obligated under this warranty for alleged defects which examination discloses are due to tampering, misuse, neglect, improper storage, and in any case where products are disassembled by anyone other than authorized Seller's representatives.

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SELLER'S LIABILITY TO BUYER FOR ANY LOSS OR CLAIM, INCLUDING LIABILITY INCURRED IN CONNECTION WITH (I) BREACH OF ANY WARRANTY WHATSOEVER EXPRESSED OR IMPLIED, (II) A BREACH OF CONTRACT, (III) A NEGLIGENT ACT OR ACTS (OR NEGLIGENT FAILURE TO ACT) COMMITTED BY SELLER, OR (IV) AN ACT FOR WHICH STRICT LIABILITY WILL BE IMPUTED TO SELLER, IS LIMITED TO THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED HEREIN. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES OF A LIKE GENERAL NATURE, INCLUDING, WITHOUT LIMITATION, LOSS OF PROFITS OR PRODUCTION, OR LOSS OR EXPENSES OF ANY NATURE INCURRED BY THE BUYER OR ANY THIRD PARTY.

*UE specifications subject to change without notice.*

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