ABLE Instruments & Controls

105 Series

PRESSURE, VACUUM, DIFFERENTIAL PRESSURE, TEMPERATURE

FEATURES

- **Tamper-proof external setting adjustment**
- **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: 5" to 100 psid (12 mbar to 6,9 bar)

  Temperature: -120 to 640 °F (-85 to 335°C)
- **Heat Trace and Freeze Protection Models**

UNITED ELECTRIC CONTROLS

ABLE Instruments & Controls

OVERVIEW

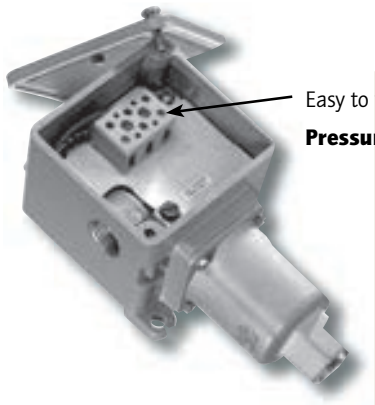
Designed to meet the demanding temperature and pressure requirements of the power and process industries, the 105 Series meets classification for watertight, dust-tight and corrosion resistant construction.

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

- UL listed, CSA & CE certified
- External dial with gasketed, stainless steel, tamper resistant dial cover
- SPDT switch output
- Terminal block wiring
- Meets NEMA 4X requirements



Easy to wire terminal block

Pressure Model

Local Mount (Immersion Stem)

Temperature Model

Differential Pressure Model

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VAT No: GB 417 2481 61

SPECIFICATIONS

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

APPROVALS

UL Listed
Pressure: UL 508 -- File #E42272
Temperature: UL 873 -- File #E10667

CSA Certified
Pressure: CSA C22.1-02, C22.2 No. 0-M91, 0.4-M1982, 14-M95 – File #LR39690
Temperature: CSA C22.1-02, C22.2 No. 0-M91, 24-93 – File #LR7814

CENELEC/TÜV Süddeutschland Bau und Betrieb GmbH (N.B. #0036)
TÜV certified to PED (97/23/EC)
Category IV, Module H1 (Must select Option M407, otherwise UEC compliant to CE Category I)
Certificate #USA 02/04/38/001 thru USA 02/07/38/033

UEC Compliant to LVD (73/23/EC & 93/68/EEC)

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ABLE Instruments & Controls

PRESSURE MODEL CHART

Model	Adjustable Set Point Range Low end of range on fall; High end of range on rise		Deadband		Proof Pressure**		Dial Divisions
H105	psi	bar	psi	bar	psi	bar	psi
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 0.9 "Hg	0,007 to 0,03	5	0, 3	1/2 "Hg
S134B	30 "Hg VAC to 20 psi	-1 to 1,4	0.2 to 1.2 "Hg	0,007 to 0,04	25	1,7	1 "Hg & 1/2 psi
S137B	2 to 80 "wc	0,01 to 0,2	2 to 10 "wc	0,005 to 0,02	5	0,4	2 "wc
S144B	0 to 20	0 to 1,4	0.1 to 0.5	0,01 to 0,03	25	1,7	1/2
S146B	0 to 30	0 to 2,1	0.1 to 0.5	0,01 to 0,04	40	2,8	1/2
S156B	0 to 100	0 to 6,9	0.2 to 0.8	0,01 to 0,06	125	8,6	2
S164B	0 to 200	0 to 13,8	0.3 to 2	0,02 to 0,14	200	13,8	5
Brass bellows with 1/4" NPT (female) nickel plated brass; models 126 & 134 have zinc-plated steel spring in media							
126	30 "Hg VAC to 0 psi	-1 to 0	0.2 to 0.9 "Hg	0,007 to 0,03	5	0, 3	1/2 "Hg
134	30 "Hg VAC to 20 psi	-1 to 1,4	0.2 to 1.2 "Hg	0,007 to 0,04	25	1,7	1 "Hg & 1/2 psi
137	2 to 80 "wc	0,01 to 0,2	2 to 10 "wc	0,005 to 0,02	5	0,4	2 "wc
144	0 to 20	0 to 1,4	0.1 to 0.5	0,01 to 0,03	25	1,7	1/2
146	0 to 30	0 to 2,1	0.1 to 0.5	0,01 to 0,04	40	2,8	1/2
156	0 to 100	0 to 6,9	0.2 to 0.8	0,01 to 0,06	125	8,6	2
164	0 to 200	0 to 13,8	0.3 to 2	0,02 to 0,14	200	13,8	5

Model	Adjustable Set Point Range Low end of range on fall; High end of range on rise		Deadband		Working Pressure***		Proof Pressure**		Dial Divisions
H105K Differential Pressure									
	psi	bar	psi	bar	psi	bar	psi	bar	psi
Buna N diaphragm and O-ring with 1/4" NPT (female) aluminum pressure connection									
455	5 to 80 "wcd	12 to 199 mbar	1 to 4 "wc	2,5 to 10 mbar	30 "Hg Vac to 225	-1 to 15,5	225	15,5	2 "wc
456	2 to 20psid	0,14 to 1,4	0.1 to 0.3	0,01 to 0,02	30 "Hg Vac to 225	-1 to 15,5	225	15,5	0.5
457	3 to 30psid	0,2 to 2,1	0.1 to 0.4	0,01 to 0,03	30 "Hg Vac to 225	-1 to 15,5	225	15,5	1
Teflon® and Buna N diaphragms, Buna N O-Ring with aluminum 1/4" NPT (female) pressure connections									
559	0 to 100 psid	0,7 to 6,9	0.2 to 1.0	0,01 to 0,07	30 "Hg Vac to 225	-1 to 15,5	225	15,5	2

TEMPERATURE MODEL CHART: BULB & CAPILLARY SENSORS

Model	Adjustable Range		Max. Temperature		Scale Division		Bulb Size
E105	°F	°C	°F	°C	°F	°C	OD x Length
2BSA	-120 to 100	-84.4 to 37.8	150	65.5	5	5	3/8 x 2 5/8"
5BS	-20 to 80	-28.9 to 26.7	130	54.4	2	2	3/8 x 5"
4BS	25 to 100	-3.9 to 37.8	150	65.5	2	1	3/8 x 6 3/4"
2BSB	30 to 250	-1.1 to 121.1	300	148.9	5	5	3/8 x 2 5/8"
3BS	100 to 400	37.8 to 204.4	450	232.2	5	5	3/8 x 2 1/8"
8BS	350 to 640	176.7 to 337.8	690	365.6	5	5	3/8 x 3 1/4"
13271	25 to 325	-3.9 to 162.8	360	182.2	5	5	1/8 x 11 5/8" (Heat Tracing)

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TEMPERATURE MODEL CHART: LOCAL MOUNTED IMMERSION STEM SENSORS

Model	Adjustable Range		Max. Temperature		Scale Division		Stem Size
B105	°F	°C	°F	°C	°F	°C	OD x Length
119	15 to 140	-9.4 to 60	160	71.1	2	2	9/16" x 2 11/16" (stainless steel)
120	0 to 225	-15 to 105	275	135	5	5	9/16" x 1 7/8" below thread (nickel-plated brass)
121	200 to 425	95 to 215	475	245	5	5	9/16" x 1 7/8" below thread (nickel-plated brass)
13270	15 to 140	-9.4 to 60	160	71.1	2	2	9/16" x 2 11/16" (stainless steel) (Freeze Protection)

***Teflon*®** is a registered trademark of E.I. DuPont.
****Proof Pressure:*** The maximum pressure to which a pressure sensor may be occasionally subjected, which causes no permanent damage. The unit may require calibration (e.g. start-up, testing).
*****Working Pressure Range:*** The pressure range within which two opposing sensors can be safely operated and still maintain set point adjustability provided the difference in pressure between them does not exceed the designated adjustable range.

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 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
M277	Range indicated on nameplate in kPa/MPa. NOT AVAILABLE TEMPERATURE VERSIONS
M278	Range indicated on nameplate in Kg/cm^2. NOT AVAILABLE TEMPERATURE VERSIONS
M407	CE Compliance to Pressure Equipment Directive (category IV). NOT AVAILABLE MODELS 126, 137, S126B, S137B
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

***Viton*®** is a registered trademark of Dupont Dow Elastomers.

Note: No options are available on Heat Trace and Freeze Protection Models 13270 and 13271 except M201, M444 and M446.

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OPTIONS FOR TEMPERATURE MODELS

UNION CONNECTORS

Option	Replacement Number	Description
	Brass	
W027	SD6213-27	1/2 " NPT w/ 3/4" bushing
W045	SD6213-45	3/4" NPT
W051	SD6213-51	1/2" NPT
	304 Stainless Steel	
W028	SD6213-28	1/2" NPT w/ 3/4" bushing
W046	SD6213-46	3/4" NPT
W050	SD6213-50	1/2" NPT

THERMOWELLS

For all bulb & capillary switches, all 1/2" NPT Internal

	Brass	
W075	SD6225-75	3/4" bushing adapter, 4" BT
W191	SD6225-191	1/2" NPT, 4" BT
W118	SD6225-118	3/4" bushing adapter, 7" BT
W192	SD6225-192	1/2" NPT, 7" BT
	316 Stainless Steel	
W076	SD6225-76	3/4" NPT, 4.5" BT
W193	SD6225-193	1/2" NPT, 4.5" BT
W119	SD6225-119	3/4" NPT, 7.5" BT
W177	SD6225-177	1/2" NPT, 7.5" BT

For all immersion stem switches; not available Model 119

W139	SD6225-139	3/4" NPT X 1 23/32" BT, BRASS
W140	SD6225-140	3/4" NPT X 1 23/32" BT, 316 ST/ST

W000 IMMERSION STEM AND THERMOWELLS, Not available Model 119

Note: Option W000 is a special Immersion Stem construction that has no external thread. This option fits inside a special thermowell and is secured with a set-screw.

Option	Description
W000	Immersion stem only, BRASS
W097	Immersion stem and thermowell. Includes W000 stem and 1/2" NPT x 1 23/32" BT BRASS thermowell
W099	Immersion stem and thermowell. Includes W000 stem and 1/2" NPT x 1 23/32" BT 316 ST/ST thermowell.

OPTIONAL LENGTHS:

Optional immersion stem lengths to 15" available in brass, with or without 316 st/st thermowell. Consult UE for additional information.

*Optional capillary length to 50' available in copper or 304 st/st. Armor or Teflon® capillary protection available to lengths less than or equal to capillary length. Consult UE for additional information.

*Consult UE regarding repeatability and ambient effects on capillary lengths over 30'.

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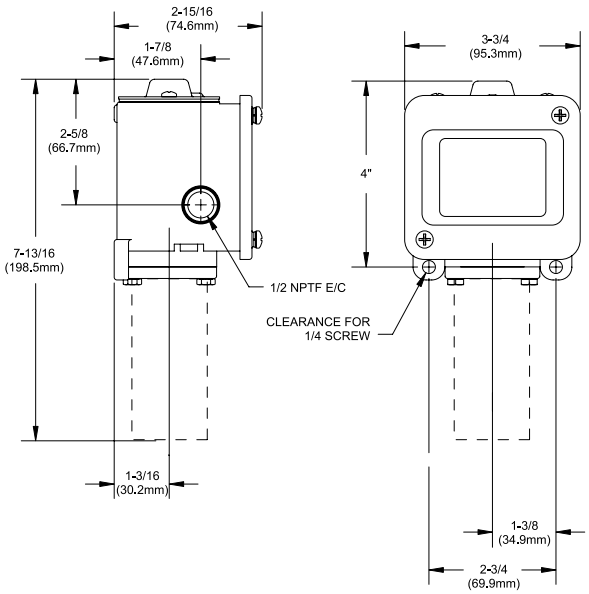
DIMENSIONAL DRAWINGS

EXTERNAL SET POINT ADJUSTMENT

Types H105, H105K, B105, E105

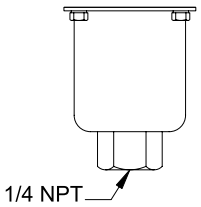


Dimension A			
Models	**Inches**	**mm**	**NPT**
Pressure			
126-164	6.56	165,89	1/4
S126B-S164B	6.94	176,21	1/2
Differential Pressure			
455-559	7.75	196,85	1/4
Temperature			
120-121	8.38	212,73	Immersion Stem
2BSA-8BS, 13271	8.69	220,73	Bulb & Capillary
13270	8.50	215,9	Immersion Stem

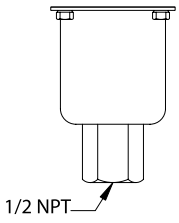
All dimensions stated in inches (mm)

PRESSURE SENSORS

Models 126-164

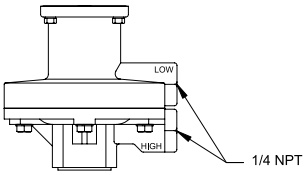


Models S126B-S164B



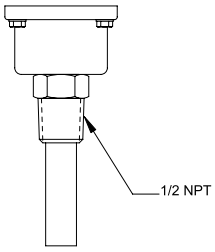
DIFFERENTIAL PRESSURE SENSORS

Models 455-559

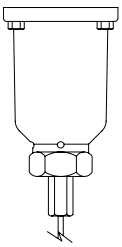


TEMPERATURE SENSORS

Models 120-121



Models 2BSA-8BS, 13271



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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 pressure or temperature is acceptable on a limited basis (e.g., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum pressure or 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.
- Do not mount unit in ambient temperature exceeding published limits.

LIMITED WARRANTY

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 (Ex-works, Factory, Watertown, Massachusetts. INCOTERMS); provided, however, that this warranty applies only to equipment found to be so defective within a period of 24 months from the date of manufacture by the Seller. 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. EXCEPT FOR THE LIMITED WARRANTY OF REPAIR AND REPLACEMENT STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES WHATSOEVER WITH RESPECT TO THE PRODUCT, INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF SELLER'S LIABILITY

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 INPUTTED TO SELLER, IS LIMITED TO THE "LIMITED WARRANTY" OF REPAIR AND/OR REPLACEMENT AS SO STATED IN OUR WARRANTY OF PRODUCT. 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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