THE 105 SERIES IS DISCONTINUED
PLEASE CONTACT ARCO ENGINEERING
FOR REPLACMENTS.

105 Series

PRESSURE, VACUUM, DIFFERENTIAL PRESSURE, TEMPERATURE

FEATURES

- Tamper-resistant 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" wcd to 100 psid (12,4 mbar to 6,9 bar)

  Temperature: -120 to 640°F (-84.4 to 337.8°C)
- Heat Trace and Freeze Protection Models

105 Series

OVERVIEW

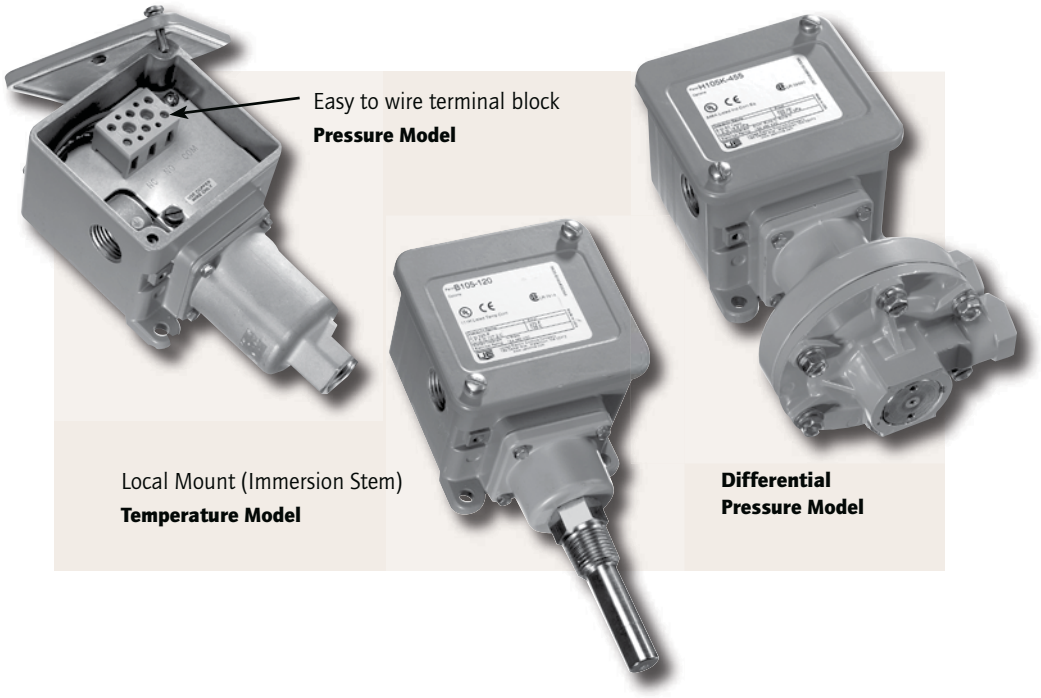
Designed to meet the demanding temperature and pressure requirements of the power and process industries, the 105 Series meets classification for watertight, dust-tight and corrosion resistant construction.

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.

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

FEATURES

- UL listed, cUL certified, & CE compliant
- External dial with gasketed, stainless steel, tamper resistant dial cover
- Terminal block wiring
- Meets Enclosure type 4X requirements
- Optional ATEX and Gosgortechnadzor intrinsic safety compliance
- Optional adjustable deadband switch



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; epoxy powder coated; gasketed stainless steel tamper-resistant dial cover; captive cover screws
ENCLOSURE CLASSIFICATION	Designed to meet Enclosure Type 4X requirements
SWITCH OUTPUT	One SPDT; switch may be wired "normally open" or "normally closed"
ELECTRICAL RATING	15 A 125/250/480 VAC resistive except for B105-13270 and E105-13271, 22 A/480 VAC. Electrical switches have limited DC capabilities. Consult factory for additional information.
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 except for E105-13271, 10 feet 304 stainless steel Immersion stem: 304 stainless steel; models 119, 120, & 121: nickel-plated brass (standard) optional 316L stainless steel available except for B105-13270
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.

APPROVALS

UNITED STATES AND CANADA
UL Listed, cUL/CSA Certified
Pressure: UL 508, CSA C22.2 No. 14 , file #E42272
Temperature: UL 873, file #E10667;
CSA C22.2 No. 0 & 24, files #LR7814

EUROPE
ATEX Directive (94/9/EC)
II 1 G EEx ia IIC T6 **(Optional - code M405)**
Tamb = -50°C to +60°C
International DEMKO A/S (N.B.# 0539)
Certificate # DEMKO 03 ATEX 0335063
EN 50014, 50020 & 50284

Low Voltage Directive (LVD) (73/23/EC & 93/68/EEC)
Compliant to LVD
Products rated lower than 50 VAC and 75 VDC are outside of the scope of the LVD
The Low Voltage Directive does not apply to products for use in hazardous locations

Pressure Equipment Directive (PED) (97/23/EC)
Compliant to PED
Products rated below 7.5 psi are outside the scope of the PED

RUSSIA
Gosgortechnadzor Permit **(Optional - code M406)**
0ExiaIICT6
Tamb = -50°C to +60°C
NANIO CCVE Certification Center
Certificate # RRS 00-22739
GOST R 51330.0, 51330.10 & 51330.14

PRESSURE MODEL CHART

Model	Adjustable Set Point Range Low end of range on fall; High end of range on rise		Deadband		Over Range Pressure*		Proof Pressure**		Dial Divisions
H105	psi (unless noted)	bar (unless noted)	psi (unless noted)	mbar	psi	bar	psi	bar	psi
Welded 316L stainless steel bellows and 1/2" NPT (female) pressure connection									
S126B	30 "Hg to 0 psi	-1 to 0	0.2 to 0.9 "Hg	6,8 to 30,5	3	0,2	5	0,3	1/2 "Hg
S134B	30 "Hg to 20 psi	-1 to 1,4	0.2 to 1.2 "Hg	6,8 to 40,6	20	1,4	25	1,7	1 "Hg & 1/2 psi
S137B	2 to 80 "wc	5,0 to 199,1 mbar	2 to 10 "wc	5,0 to 24,9	3	206,8 mbar	5	0,3	2 "wc
S144B	0 to 20	0 to 1,4	0.1 to 0.5	6,9 to 34,5	20	1,4	25	1,7	1/2
S146B	0 to 30	0 to 2,1	0.1 to 1.5	6,9 to 34,5	30	2,1	40	2,8	1/2
S156B	0 to 100	0 to 6,9	0.2 to 0.8	13,8 to 55,2	100	6,9	125	8,6	2
S164B	0 to 200	0 to 13,8	0.3 to 2	20,7 to 137,9	200	13,8	200	13.8	5
Brass bellows with nickel plated brass 1/4" NPT (female) pressure connection; models 126 & 134 have zinc-plated steel spring exposed to media									
126	30 "Hg to 0 psi	-1 to 0	0.2 to 0.9 "Hg	6,8 to 30,5	3	0,2	5	0,3	1/2 "Hg
134	30 "Hg to 20 psi	-1 to 1,4	0.2 to 1.2 "Hg	6,8 to 40,6	20	1,4	25	1,7	1 "Hg & 1/2 psi
137	2 to 80 "wc	5,0 to 199,1 mbar	2 to 10 "wc	5,0 to 24,9	3	206,8 mbar	5	0,3	2 "wc
144	0 to 20	0 to 1,4	0.1 to 0.5	6,9 to 34,5	20	1,4	25	1,7	1/2
146	0 to 30	0 to 2,1	0.1 to 1.5	6,9 to 34,5	30	2,1	40	2,8	1/2
156	0 to 100	0 to 6,9	0.2 to 0.8	13,8 to 55,2	100	6,9	125	8,6	2
164	0 to 200	0 to 13,8	0.3 to 2	20,7 to 137,9	200	13,8	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									
	psid (unless noted)	bar (unless noted)	psi (unless noted)	mbar	psi (unless noted)	bar	psi	bar	psi
Buna N diaphragm and O-ring with aluminum 1/4" NPT (female) pressure connections									
455	5 to 80 "wcd	12,4 to 199,1 mbar	1 to 4 "wc	2, 5 to 10,0	30 "Hg VAC to 225	-1 to 15,5	225	15,5	2 "wc
456	2 to 20	0,1 to 1,4	0.1 to 0.4	6,9 to 20,7	30 "Hg VAC to 225	-1 to 15,5	225	15,5	.05
457	3 to 30	0,2 to 2,1	0.1 to 0.4	6,9 to 27,6	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	10 to 100	0,7 to 6,9	0.2 to 1.0	13,8 to 68,9	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	65.6	5	5	3/8 x 2-7/16"
2BSB	30 to 250	-1.1 to 121.1	300	148.9	5	5	3/8 x 2-7/16"
3BS	100 to 400	37.8 to 204.4	450	232.2	5	5	3/8 x 2-1/8"
4BS	25 to 100	-3.9 to 37.8	150	65.6	2	1	3/8 x 6 3/4"
5BS	-20 to 80	-28.9 to 26.7	130	54.4	2	2	3/8 x 5"
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)

LOCAL MOUNTED IMMERSION STEM SENSORS

Model	Adjustable Range		Max. Temperature		Scale Division		Stem Size‡/Finish
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	-17.8 to 107.2	275	135	5	5	9/16" x 1-7/8" below thread (nickel-plated brass)
121	200 to 425	93.3 to 218.3	475	246.1	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)

Over Range Pressure: The maximum pressure that may be applied continuously without causing damage and maintaining set point repeatability.
****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
‡ Optional immersion stem lengths and capillary lengths are available. Standard capillary length is 6 ft. except HTFP models which are 10 ft.

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 or VAC 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 TEMPERATURE VERSIONS
1535	High ambient, 15 A 125/250 VAC resistive; temperatures up to 250°F (121°C)
2000	20 A 125/250 VAC resistive
OTHER OPTIONS	
M201	Factory set one switch; specify set point on increasing or decreasing pressure or temperature
M277	Range indicated on nameplate in kPa/MPa, factory selected. NOT AVAILABLE TEMPERATURE VERSIONS
M278	Range indicated on nameplate in Kg/cm^2. NOT AVAILABLE TEMPERATURE VERSIONS
M405	Intrinsic safety compliance for European Union per ATEX standards
M406	Intrinsic safety compliance for Russia per Gosgortechnadzor standards
M444	Paper ID tag
M446	Stainless steel ID tag & wire attachment
M504	316L Stainless steel immersion stem. AVAILABLE TEMPERATURE 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
M913	1/4" NPT (female) 316L stainless steel pressure connection. AVAILABLE MODELS S126B-S164B

* All switches have limited DC capabilities. Consult factory for details

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

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.

105 Series

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:

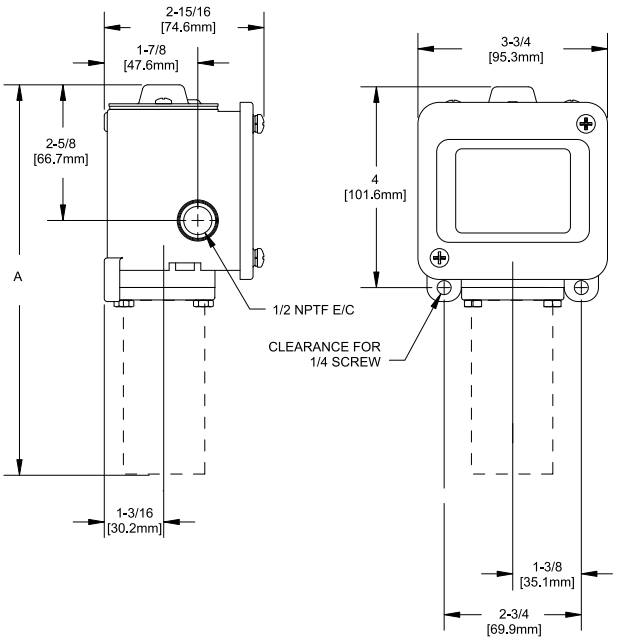
Optional immersion stem lengths to 15" available in brass, with or without 316 st/st thermowell. Consult UE for additional information.

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'.

DIMENSIONAL DRAWINGS

Types H105, H105K, B105, E105

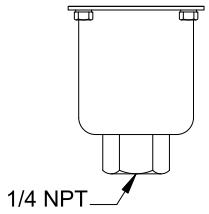


Dimension A			
Models	**Inches**	**mm**	**NPT**
Pressure			
126-164	6.56	166.6	1/4
S126B-S164B	7.00	177.8	1/2
Differential Pressure			
455-559	7.63	193.8	1/4 (x2)
Temperature			
119-121, 13270	8.50	215.9	Immersion Stem
2BSA-8BS, 13271	7.81	198.5	Bulb & Capillary

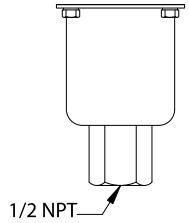
All dimensions stated in inches (mm)

PRESSURE SENSORS

Models 126-164

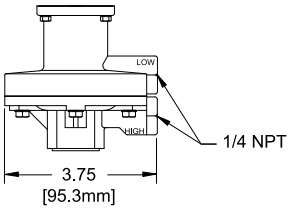


Models S126B-S164B

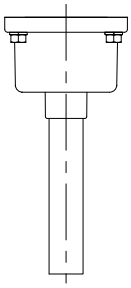


DIFFERENTIAL PRESSURE SENSORS

Models 455-559

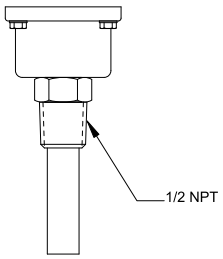


Models 119, 13270

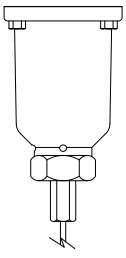


TEMPERATURE SENSORS

Models 120-121



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 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. When applicable, 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.
- 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 temp. 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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