

400 Series Pressure Controls

Types: H400, H402, H403, H400K, H402K, H403K, J400, J402, J403, J400K, J402K, J403K



UNITED ELECTRIC
CONTROLS

Installation and Maintenance Instructions

Please read all instructional literature carefully and thoroughly before starting. Refer to the final page for the listing of Recommended Practices, Liabilities and Warrantees.

GENERAL


Pressure variations are sensed by a bellows, diaphragm or piston sensor which either actuates or de-actuates one, two or three snap-acting switches at a pre-determined set point(s). Set point(s) is adjusted by turning an internal knob and pointer (H types) or internal screw (J types).

Part I - Installation

Tools Needed

Screwdriver
Hammer
Adjustable wrench


MOUNTING

 INSTALL UNIT WHERE SHOCK, VIBRATION AND TEMPERATURE FLUCTUATIONS ARE MINIMAL. ORIENT UNIT SO THAT MOISTURE IS PREVENTED FROM ENTERING THE ENCLOSURE. IF UNIT IS BEING INSTALLED WHERE HEAVY CONDENSATION IS EXPECTED, VERTICAL MOUNTING (PRESSURE CONNECTION DOWN) IS REQUIRED. DO NOT MOUNT UNIT IN AMBIENT TEMPERATURES EXCEEDING PUBLISHED LIMITS.

400 Series pressure controls can be mounted in any position, provided the electrical conduit is not facing up. The preferred mounting position is vertical (pressure connection down).

The cast-in knockouts for 3/4" electrical conduit are located on the side and rear of the enclosure. These can easily be knocked out by placing the blade of a screwdriver in the groove and rapping sharply with a hammer.

Mount the unit via the (2) 1/4" screw clearance holes on the enclosure. See Dimensions. Units may also be mounted via the NPT pressure connection.

 ALWAYS HOLD A WRENCH ON THE PRESSURE HOUSING HEX WHEN MOUNTING UNIT. DO NOT TIGHTEN BY TURNING ENCLOSURE. THIS WILL DAMAGE SENSOR AND WEAKEN SOLDER OR WELDED JOINTS.

WIRING



DISCONNECT ALL SUPPLY CIRCUITS BEFORE WIRING.



ELECTRICAL RATINGS STATED IN LITERATURE AND ON NAME-PLATE SHOULD NEVER BE EXCEEDED. OVER-LOAD ON A SWITCH CAN CAUSE FAILURE ON THE FIRST CYCLE.



WIRE UNITS ACCORDING TO LOCAL AND NATIONAL ELECTRICAL CODES. MAXIMUM RECOMMENDED WIRE SIZE IS 14 AWG.

Connect conduit to the case and wire directly to the switch terminals according to local and national electrical codes. Bring the wires up to terminals from the rear of the case. (See fig. 1.) If manual reset switch or DPDT options are used, lead wires are supplied, color coded as follows:

	Switch 1	Switch 2
Common	Violet	Yellow
Normally Open	Blue	Orange
Normally Closed	Black	Red



ALLOW ENOUGH SLACK SO AS NOT TO AFFECT SWITCH MOVEMENT WHEN MAKING SETTING ADJUSTMENTS AND ENSURE THAT THE WIRES ARE NOT TOUCHING THE COVER WHEN INSTALLED.

NOTE: For larger wire gauges, a one time shift may be experienced or expected due to space limitations within the enclosure. Verify setpoint after installation.

NOTE: The middle switch assembly is omitted for dual switch controllers. The outer switch assemblies are omitted for single switch controllers. Type "J" controls have internal screw adjustments and type "H" have cam assemblies for internal calibrated adjustments.

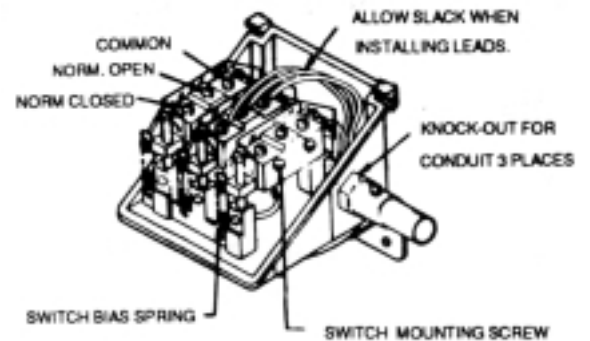


Figure 1

Special Instructions For Vacuum Ranges

On vacuum ranges, the C-NO circuit is closed at sea level conditions. Therefore, increasing vacuum will cause the C-NC circuit to close while decreasing vacuum will cause the C-NO circuit to close. Please make a note of this and wire/adjust the unit accordingly.

Special Instructions for Models 520-535

When calibrating the Models 520-537, Switch 2 (the right switch as viewed from the front of the control) must be set to the lower pressure value. Use a screwdriver to turn the adjustment screw and obtain the desired actuation pressure for Switch 2. Switch 1 can then be set following the procedure outlined above for other J402 products. Maximum separation between Switch 1 and 2 is defined in Table 1.

Part II - Adjustments

Tools Needed

Screwdriver

NOTE: For set point adjustments and re-calibration, connect control to a calibrated pressure gauge.

Type J400 & J400K

Remove cover. Switch has screw adjustments inside enclosure. Increase gauge pressure until switch transfers. To RAISE the pressure setting turn the screw IN. One full clockwise turn corresponds to 10% of range on diaphragm and piston models, and 20% of range on bellows models. To LOWER pressure setting turn screw OUT. One full counter-clockwise turn corresponds to 10% of range on diaphragm and piston models, and 20% of range on bellows models. When making adjustments, do not exceed the proof pressure rating on nameplate.

Types J402, J403, H402K & J403K

Remove cover, follow same procedure as paragraph above. Switches may be set together or apart, up to 100% of range scales (maximum separation on models 520-535 is defined in Table 1). On dual switch, either switch may be set high. On triple switch models, the third (middle) switch has no over-travel mechanism and must always be set to the highest pressure when switches are set apart. Altering the setting of one switch will usually have little effect on the other(s), however re-calibration may be desired at a critical pressure setting and after changing switch(es) or sensor.

Table 1

Model & Range	Switch Separation (% of Range Span)
520, 530 (-300 to 0" W.C. VAC)	25%
521, 531 (-10 to +10 "wc)	35%
522, 532 (-50 to +50 "wc)	35%
523, 533 (0.5 to 5 "wc)	50%
524, 534 (2.5 to 50" wc)	50%
525, 535 (10 to 250 "wc)	20%
540 (1 to 7 "wc)	95%
541 (2 to 20 "wc)	95%
542 (5 to 50 "wc)	95%
543 (15 to 100 "wc)	95%
544 (2 to 20 psi)	95%
545 (5 to 50 psi)	95%
546 (10 to 100 psi)	95%
547 (20 to 200 psi)	95%

Types H400, H402, H403, H400K, H402K & H403

Controls are factory calibrated for maximum accuracy at the dial midpoint. Switches may be set together or apart up to 100% of the range scale. On dual switch models either switch may be set high. On triple switch models, the third (middle) switch has no over-travel mechanism and must always be set to the highest pressure when the switches are set apart. Altering the setting of one switch will usually have little effect on the other(s), however re-calibration may be desired at a critical setting or after changing switch(es) or sensor.

To re-calibrate, turn pointer to desired set point and add gauge pressure until switch transfers. If gauge pressure and set point pressure do not agree, turn zero adjust screw clockwise to raise. Counter-clockwise to lower setting.

Types With Manual Reset (Option 1530)

These optional models incorporate a snap switch that, when actuated, remains tripped until pressure changes and the reset button is manually depressed to the reset position. On multi-switch units, this switch must be set to the highest setting.

Types J400K, J402K, J403K with Option M210

(indicator models 147, 157, S147B, S157B only)

To adjust for maximum accuracy at any desired set point, follow steps 1 - 4 below:

SPAN ADJUSTMENT

- 1) Remove front window and gasket (four screws) to gain access to span adjustment.
- 2) Connect control to calibrated pressure source and set to required differential pressure.
- 3) Using a screw driver, carefully turn span adjustment (See Figure 2) to obtain required indication.
- 4) Re-mount front gasket and window.

Part III - Replacements

Tools Needed

Screwdriver

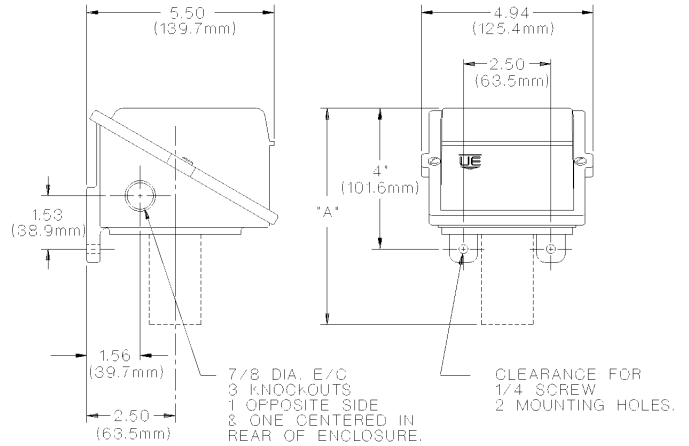


USE ONLY FACTORY AUTHORIZED REPLACEMENT PARTS AND PROCEDURES. DISCONNECT ALL LIVE CIRCUITS BEFORE PROCEEDING. COMPONENTS AVAILABLE FOR REPLACEMENT ARE THE SWITCHES. OTHER COMPONENTS FACTORY REPLACEABLE ONLY.

REPLACEMENT OF SWITCH(ES)

- 1) Disconnect leadwires.
- 2) Remove the two mounting screws. On multi-switch controls, first remove switch bias springs (See Figure 1.)
- 3) Insert replacement switch and replace screws and bias springs.
- 4) Check switch set point and re-calibrate per PART II if necessary.

Dimensions



Option M210 - Differential Pressure Indication

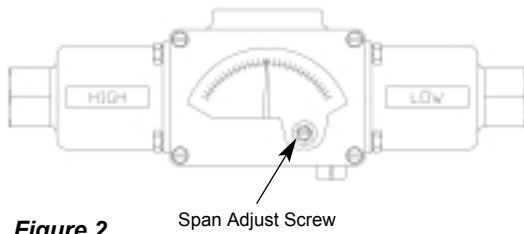
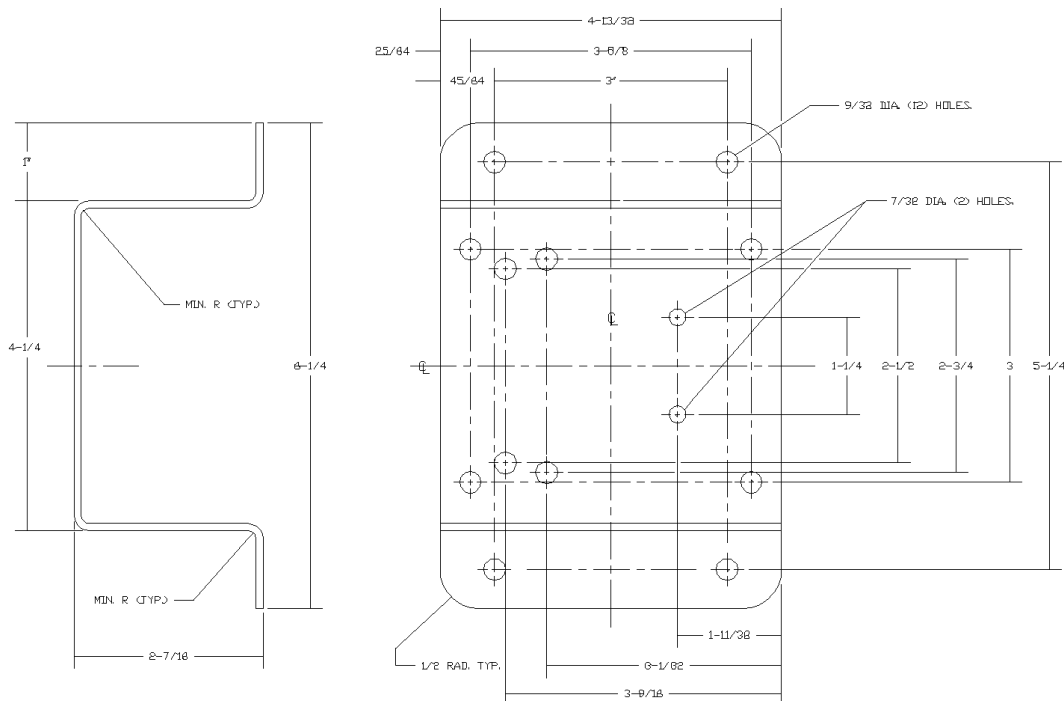


Figure 2

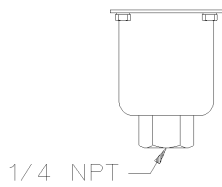
Dimension A				Dimension A			
Models	Inches	mm	NPT	Models	Inches	mm	NPT
Pressure				Pressure			
126-164	5.81	146,84	1/4	551, 553-555	4.56	115,88	1/4
S126B-S164B	6.19	157,16	1/2	550, 552	5.03	127,79	1/4
270-376	5.50	139,70	1/4	610-614	6.44	163,58	1/4
440-443, 449, 451, 453, 454	4.28	108,74	1/4	Differential Pressure			
448, 450, 452	5.03	127,79	1/4	147-157	6.13	155,57	1/4
520-525	8.62	218,90	1/2	S147B-S157B	6.13	155,57	1/2
530-535	8.12	206,20	1/2	455-559	7.00	178,05	1/4
				540-543	7.90	200,7	1/8
				544-547	8.06	204,7	1/8

Option M449 - Surface Mounting Hardware

(Models 520-535 only)

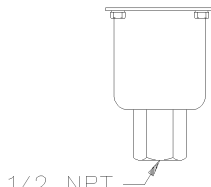


Pressure



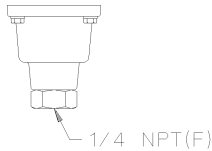
1/4 NPT

Models 126-164



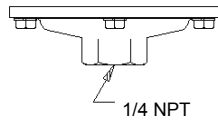
1/2 NPT

Models S126B-S164B



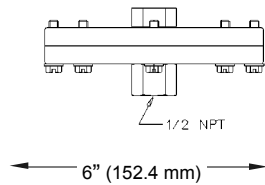
1/4 NPT(F)

Models 270-376



1/4 NPT

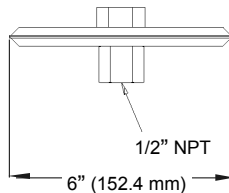
Models 440-555



1/2 NPT

6" (152.4 mm)

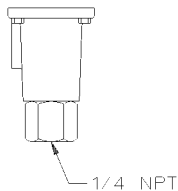
Models 520-525



1/2" NPT

6" (152.4 mm)

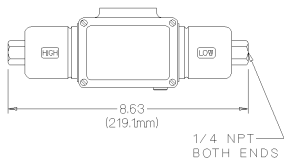
Models 530-535



1/4 NPT

Models 610-614

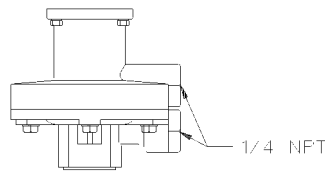
Differential Pressure



8.63
(219.1mm)

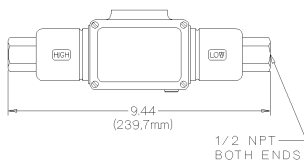
1/4 NPT
BOTH ENDS

Models 147-157



1/4 NPT

Models 455-559



9.44
(239.7mm)

1/2 NPT
BOTH ENDS

Models S147B-S157B

RECOMMENDED PRACTICES

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 max temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to proof pressure or max 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 proof pressure or 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 dangerous runaway condition could result.

- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point can not 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.

- 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. Check unit immediately.

- Preventative maintenance/periodic testing is necessary for critical applications where damage could endanger property/ 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, possible 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.

- For remote mounted temperature units, capillary lengths beyond 10 feet can increase chance of error, and may require re-calibration of set point and indication.

LIMITED WARRANTY

UE warrants that the product thereby 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 UE (F.O.B. UE); provided, however, that this warranty applies only to equipment found to be so defective within a period of 12 months after installation by buyer but not to exceed 18 months after delivery by the seller. Except for the limited warranty of repair and replacement stated above, UE disclaims all warranties whatsoever with respect to the product, including all implied warranties of merchantability or fitness for any particular purpose.

LIABILITY LIMITATION

The sole and exclusive remedy of buyer for any liability or seller for any claim, including 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 or repair and replacement stated herein. In no event shall the seller be liable for any special, indirect, consequential or other damages or 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.



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