ELECTRONIC PRESSURE, DIFFERENTIAL PRESSURE AND TEMPERATURE SWITCHES

PRODUCT FEATURES

- **All Solid State Design**

- **Fully Adjustable Set Point and Deadband**

- **I Am Working Diagnostic Signal**

- **Class I, Division 2 Approved**

- **Wide Variety of Switching Outputs and Sensor Options**

ISO 9001 CERTIFIED COMPANY

UE UNITED ELECTRIC CONTROLS

ONE-B-01

OVERVIEW

One Series Electronic Pressure, Differential Pressure & Temperature Switches are designed for critical alarm and shutdown applications in harsh hazardous environments. A local indicator and remote I Am Working (IAW®) status signal provide continuous notification that the device is powered, healthy and whether the switch has tripped, assuring the operator that the One Series will perform when called upon.

Low level DC outputs (output configurations A and B) may be used to trigger control circuits or as a discrete input to a process computer (DCS or PLC).

A 13 Amp VAC solid-state relay (output configuration C) provides local high level switching for actuation or shutdown of your system.

The switch output mode may be configured by the user in the field without re-wiring. An optional 4 to 20 mA analog output allows remote monitoring and trending of the process variable.

The self-contained, compact package allows for easy retrofit of mechanical switches or transmitters.

115 VAC and 230 VAC input/output configurations enable the One Series to be powered by an AC source and switch AC loads. Approved for Division 2 hazardous locations and harsh environmental conditions, this rugged design will stand up to your most demanding applications.

FEATURES

- 18-30 VDC, 115 VAC or 230 VAC power supply

- Real time local digital display of process variable

- Optional 4 to 20 mA analog output

- All solid-state; no moving parts

- Set point and deadband adjustable over the sensors full operating range

- Solid-state switching provides extended switch life with no contact wear

- Pipe or surface mounting

- Approved for Division 2 locations; Enclosure type 4X

- 3 year warranty

One Series with 115 VAC power supply, top enclosure contains separate high voltage and low voltage terminal blocks and pass-through conduit connectors

One Series with remote temperature sensor, digital display and 100 mA switch output

One Series with stainless-steel
differential pressure sensor

One Series with gauge pressure
sensor and LEXAN® cover removed

One Series with 3A rated
sanitary sensor

One Series with local temperature
sensor (shown with optional
PF73 compression fitting)

One Series with inches-of-water
column, differential pressure
sensor (shown with optional
barb fittings)

One Series

APPLICATIONS

The One Series combines the best features of traditional switches and transmitters in one package. Use it for all threshold detection and switching applications.
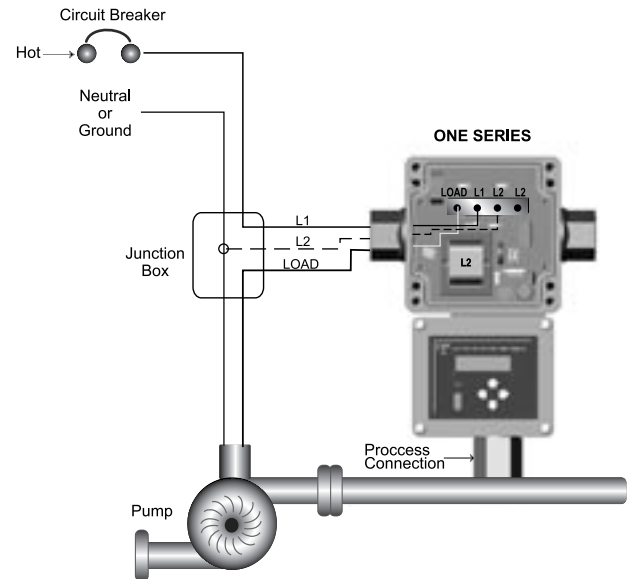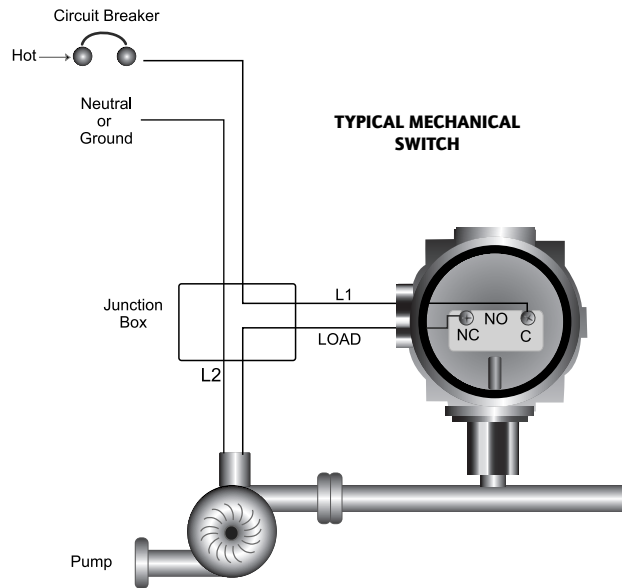
Pipelines & Pumping Stations

Chemical Plants and Refineries

REPLACING A MECHANICAL SWITCH WITH THE ONE SERIES REQUIRES ONE ADDITIONAL WIRE

Circuit Breaker

Hot →

Neutral
or
Ground

TYPICAL MECHANICAL SWITCH

Junction
Box

L1

LOAD

L2

NO
NC   C

Pump

Circuit Breaker

Hot →

Neutral
or
Ground

ONE SERIES

Junction
Box

L1
L2
LOAD

LOAD L1 L2 L2

L2

Proccess
Connection

Pump

FROM MECHANICAL SWITCH:

• AC voltage must be located nearby for the pump

• This switch is in close proximity to the pump

• The switch breaks the power supply leg to the pump (load)

TO ONE SERIES:

• Pull one additional neutral wire from the junction box to the One Series switch

• Just like the mechanical switch, the SSR breaks the power supply leg to the pump (load)

Rotating Equipment

Rugged construction, wide media compatibility and flexible mounting options combine to make the One Series the ideal choice for monitoring and controlling critical pressure and temperature thresholds for a variety of process applications. It can also help you satisfy standards such as ISA S84.01 and IEC 61508 in areas such as redundancy, diverse technologies and reduced testing intervals. The One Series employs solid-state technology with no moving parts and is approved for use in Class I, Division 2 hazardous locations by UL for USA and Canadian installations. All pressure and differential pressure models include FM approvals.

TRADITIONAL SWITCH FEATURES:

- AC or DC operation
- Low cost
- Simple to wire and operate
- Direct load switching

TRANSMITTER FEATURES:

- Solid-state performance. No moving parts
- Live zero, "health indication"
- Remote indication of process variable

THE ONE SERIES COMBINES THE BEST FROM EACH!

- AC or DC operation
- Solid-state output. No moving parts. Reliable operation
- Communicates "I Am Working" and "I Have Switched" status
- Local and remote status indicator
- Local display of process variable
- Local setting of set point, deadband and switch mode
- Local memory of minimum and maximum process extremes
- Combines a gauge, a transducer and a switch all in one package; using one process connection
- Optional 4-20 mA trending output
- Economical; about half the cost of a process transmitter

One Series

TECHNOLOGY

UNIQUE IAW® FUNCTION

The One Series provides a continuous indication of its health and the switch output status, both locally and remotely. An LED on the front panel and a discrete logic output signal are used to communicate three states:

- I Am Working but I Have Not Switched
- I Am Working and I Have Switched
- I Am Not Working

The One Series IAW® feature continuously monitors the health of the sensor, software, microprocessor and power supply. Used in conjunction with the standard switch output, the IAW® signal can also help satisfy many DPDT requirements. Functions of the IAW® signal are as follows:

IAW® Signal	Interpretation
IAW® output "On" continuously	Normal operation, unit operating properly
IAW® output pulsed "On" and "Off"	Beyond set point, unit operating properly
IAW® output "Off"	Loss of power or unit inoperable

100% SET POINT AND DEADBAND ADJUSTMENT

Set point and deadband values are adjustable over the full range span using a convenient, simple to operate, front panel keypad. Access to the programming mode requires a simple, yet tamper resistant keying sequence... It's better than password protection!

The easy-to-use local programmability of the One Series provides the following benefits:

- Eliminates the need to trade-off wide range adjustability to achieve a narrow deadband
- No more guessing about the set point or deadband values or the effects of hysteresis on the switch. All values may be displayed locally with the touch of a single button and then precisely adjusted to any point in the operating range
- Single digit (or better) resolution for both the set point and the deadband values. See DISPLAY RESOLUTION TABLE

PROCESS VARIABLE EXTREMES STORED IN NON-VOLATILE MEMORY

System pressure or temperature extremes are retained in the One Series' non-volatile memory, assisting in troubleshooting problems. The One Series continuously captures high and low pressure or temperature extremes values, providing a readout and a tamper-resistant key sequence for resetting.

- Captures and stores extreme swings (peaks and valleys) of the process variable
- Use the - extreme as a "leak down" tester
- Use the + extreme to evaluate relief valve and rupture disc performance
- Local display of +/- extreme values, with the push of a single button

UNIQUE SWITCH OPERATING MODE

The One Series provides four convenient switch operating modes which determine the function of the switch output, deadband, and IAW® LED status indicator signal. The local and remote IAW® signals will flash when the unit is in a tripped condition. The desired switch operating mode can be selected from one of four options:

- High Limit Alarm - Close on Rise (NO)
- High Limit Shutdown - Open on Rise (NC)
- Low Limit Alarm - Close on Fall (NO)
- Low Limit Shutdown - Open on Fall (NC)

The switch operating mode provides the following benefits:

- Wire the unit, then select your desired switch output (NO or NC) from a menu on the One Series' display
- Select the operation of the switch, deadband, status LED and IAW® output with a few simple keystrokes
- Eliminate wiring hassles with a single button; reconfigure rather than rewire the product if the application or requirements change

NOTE: For dual, independently-set outputs, see One Series Dual Bulletin.

EXCELLENT MEDIA COMPATIBILITY

Gauge pressure: Wetted materials include a 316 stainless steel pressure connection, ceramic pressure sensor and your choice of O-ring material. The piezoresistive ceramic sensor is compatible with most media except a few aggressive acids.

- Sanitary pressure: 316L stainless steel sanitary process fitting
- Stainless-steel differential pressure: 316 welded sensor compatible with most media
- Differential pressure (dry only): compatible with dry air and inert gases
- Temperature: 304 stainless steel sensor sheath

OUTSTANDING REPEATABILITY

A 10 bit analog-to-digital converter and software calibration provide a highly accurate and stable reading of the process variable. Calibration constants are stored in non-volatile memory to ensure set point repeatability and eliminate the need to recalibrate the instrument.

- Switch repeatability: ± 0.2% of full scale
- Display and 4-20mA accuracy: ± 1.0% of full scale

FIELD TEST AND SET

After removing the protective LEXAN® cover, the user may easily vary the set point and/or deadband values to verify proper switch operation and check process extremes. Switch modes can be changed from Normally Open to Normally Closed without wiring changes.

SPECIFICATIONS

(All Specifications at 25°C (77°F) unless otherwise specified)

SENSORS

GAUGE PRESSURE (Type 1) Ranges: 0 to 4000 psi (See MODEL CHART). Process connection: 1/2" NPT (female), 316 stainless steel. Sensor: Ceramic (96% Alumina). O-Ring: Viton® is standard. (See HOW TO ORDER for other O-Ring materials)

SANITARY PRESSURE (Type 5) Ranges: 0-600 psi (See MODEL CHART). Process connection: Tri-Clamp compatible 1-1/2" or 2" 316L stainless steel with 3-A rated finish

STAINLESS DIFFERENTIAL PRESSURE (Type 4) Ranges: 0-3000 psid (See MODEL CHART). Process Connection: 1/4" NPT (female), 316L stainless steel welded diaphragms

DRY DIFFERENTIAL PRESSURE (Type 3) Ranges: 0-5" wcd to 0-35 psid (see MODEL CHART). Process connection: 1/4" NPT (female) ports, compatible with dry air and inert gases (Silicon sensor with aluminum/plastic/glass/RTV wetted parts)

TEMPERATURE (Type 2) Ranges: -50 to 1000°F (-46 to 538 °C) (See MODEL CHART). Model H: MI extension wire, 0.125" OD x 6', 10' or 20' long. Model R: 0.25" OD with Teflon® jacketed cable with Teflon® coated leads and stainless steel overbraid, 6', 10' or 20' long. Model L: 0.25" OD x 4", 6", 10" long.

MECHANICAL

ENCLOSURE SPECIFICATIONS Die-cast aluminum epoxy powder coated; Enclosure Type 4X (except "R" temperature models. "R" models are weather tight but do not carry a specific Enclosure Type 4X rating)

WEIGHT Single enclosure units: 1-3/4 lbs. (0,8 kg); dual enclosure units: 2-1/2 lbs. (1,1 kg)

SHOCK MIL-STD Method 516.4; 10 mSec @ 15 g's, 6 mSec @ 40 g's; 3 times each axis

VIBRATION MIL-STD Method 514.4; 10-2000 Hz @ 0.04 PSD (equates to 8 g's @ 2000 Hz)

ELECTRICAL

CONDUIT/ELECTRICAL CONNECTIONS Single enclosure (switch rating A): 1/2" NPT (female), sealed conduit with 1 meter wire harness, 20 AWG, PVC jacketed, shielded cable. See optional lengths (L100 and L200)

Dual enclosure (switch rating B and C): 1/2" NPT (female) conduit connection; terminal block, accommodates 20 to 14 AWG conductors. Optional dual 1/2" NPT (female) conduit connections

Dual enclosure (switch rating D and E): dual 1/2" NPT (female) conduit connections; separate terminal blocks for high and low voltage signals, accommodates 22 to 14 AWG conductors

POWER SOURCE Switch rating A, B & C: 24 VDC nominal, 18 to 30 VDC; 100 mA maximum (surge protected). Switch rating D: 115 VAC nominal, +/- 10%. Switch rating E: 230 VAC nominal, +/- 10%

SWITCHED OUTPUT Switch rating A & B: 100 mA @ up to 50 VDC; SPST MOSFET, open drain (collector) sinking output, short circuit protected

Switch rating C: 13 A @ 24-280 VAC; SPST, solid state relay with terminal block: minimum load current is 150mA

Switch rating D: 5 A @ 115 VAC; SPST, solid-state relay; minimum load current is 150 mA

Switch rating E: 5 A @ 230 VAC; SPST, solid-state relay; minimum load current is 150 mAor dual switched outputs, see Bulletin for One Series Dual

OFF-STATE LEAKAGE CURRENT Switch Rating A and B: 10 µA @ 50 VDC, power off fail-safe "open"
Switch ratings C, D and E: 0.1 mA @ max. VAC; power off fail-safe "open"

IAW® OUTPUT 100 mA @ up to 50 VDC, SPST, MOSFET, open drain (collector) sinking output, short circuit protected. Off state leakage current 10 µA @ 50 VDC; power off fail-safe "open"

IAW® OUTPUT PULSE RATE	25 mSec on, 25 mSec off
OPTIONAL ANALOG OUTPUT	4 to 20 mA sourcing output, non-isolated, proportional to sensor input range, load resistance 500Ω maximum
EMI/RFI	Complies with CE EMC requirements EN50081-1, EN50082-2 (switch rating B and C only)
EMISSION	Conducted emission EN55011 class A; Radiated emission EN55011 class A
IMMUNITY	Electrostatic discharge EN61000-4-2; Conducted disturbances (RF) acc. IEC 1000-4-6; Radiated E-fields (RF) acc IEC 1000-4-3, acc ENV50204; Surge withstanding IEC 1000-5; Transient withstanding EN 61000-4-4

OPERATING

RANGES	See MODEL CHART for pressure, differential pressure and temperature ranges
SET POINT	Adjustable over the full range span. See MODEL CHART
DEADBAND	Adjustable over the full range span. See MODEL CHART
MAXIMUM OVER RANGE	See MODEL CHART. N/A for temperature ranges
SET POINT REPEATABILITY	±0.2% of maximum range value
ACCURACY	Switch point/indication: ±1.0% of maximum range value Analog output: ±1.0% of maximum range value
MEDIA TEMPERATURE EFFECTS	±1.0% of maximum range from 32 to 158°F (0 to 70°C)
LONG-TERM STABILITY	±0.25% of range per year, maximum
SWITCH RESPONSE TIME	25 mSec typically, 200 mSec maximum

GENERAL FEATURES

AMBIENT TEMPERATURE	Operating: -22 to 158°F (-30 to 70°C) Storage: -22 to 176°F (-30 to 80°C) Dry Differential Pressure Model: -22 to 122°F (-30 to 50°C)
MEDIA TEMPERATURE FOR GAUGE PRESSURE MODELS	Sensor type 1: Limited by O-ring material. See HOW TO ORDER. Sensor type 5: 0 to 266°F (-17 to 130°C)
MEDIA TEMPERATURE FOR DIFFERENTIAL PRESSURE MODELS (SENSOR 3)	-20 to 150°F (-28 to 65°C) @ 65 psi -20 to 140°F (-28 to 60°C) @ 80 psi -20 to 120°F (-28 to 48°C) @ 120 psi
STAINLESS DIFFERENTIAL PRESSURE MODELS (SENSOR 4)	0 to 257°F (-17 to 125°C)
MEDIA TEMPERATURE FOR TEMPERATURE MODELS	-94 to 550°F (-70 to 288°C) (Models L & R) -94 to 1150°F (-70 to 621°C) (Model H)
LOCAL DIGITAL DISPLAY	2 Row by 16 character LCD display for indication of programming parameters and process variable; also displays extreme (min/max) pressure or temperature values
LOCAL IAW® STATUS LED	Local IAW® LED to indicate switch state and health status
FIELD ACCESSIBLE PROGRAMMING	Convenient keypad allows for easy product configuration and adjustment
MEMORY	All programmed data stored in non-volatile memory (saved if power lost)
SWITCH OPERATING MODES	Field programmable for open or close on rising or falling condition

APPROVALS

UL Listed, **cUL** Certified
Class I, Division 2, Groups A, B, C, D
Class II, Division 2, Groups F, G
Class III; Enclosure type 4X (except "R" temperature models)
Class I, Zone 2, Group IIC T4

CE EMC Directive (standard on switch rating B & C. N/A on switch ratings A, D and E)
CE Compliance to Pressure Equipment Directive (PED 97/23/EC)

FM approved standard class number 3510, 3611 and 3600 (except temperature models)

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Lexan® is a registered trademark of General Electric Company
Aflas® is a registered trademark of Asahi Glass Co., Ltd.
Kalrez® is a registered trademark of E.I. DuPont Company
Tri Clamp® is a registered trademark of the TriClover Company

MODEL CHART

GAUGE PRESSURE

Sensor Type 1, 1/2" NPT (female), 316 stainless steel pressure connection, piezoresistive ceramic pressure sensor, Viton O-ring (Other O-rings available. See HOW TO ORDER)

Model	Pressure Range		Maximum Over Range The value at which the sensor may experience irreversible damage	
	psi	bar	psi	bar
A	0 to 25	1,7	50	3,4
B	0 to 50	3,4	100	6,8
C	0 to 125	9	250	18
D	0 to 250	17	500	34
E	0 to 700	48	1400	96
F	0 to 1400	96	2800	192
G	0 to 2800	193	5600	386
H	0 to 4000	276	8000	552

SANITARY PRESSURE

Sensor Type 5, 316L stainless steel diaphragm, welded sensor; Tri-clamp® compatible pressure connection, 3A Rated Finish

Part Number	Pressure Range		Maximum Over Range		Sensor Diameter
—	psi	bar	psi	bar	
T1	0 to 25	1,7	50	3,4	1 1⁄2"
T2	0 to 50	3,4	100	6,8	1 1⁄2"
T3	0 to 125	9	250	18	1 1⁄2"
T4	0 to 250	17	500	34	1 1⁄2"
T5	0 to 600	41	1400	76	1 1⁄2"
T6	0 to 25	1,7	50	3,4	2"
T7	0 to 50	3,4	100	6,8	2"
T8	0 to 125	9	250	18	2"
T9	0 to 250	17	500	34	2"

DIFFERENTIAL PRESSURE (dry air, inert gas)

Sensor Type 3, 1/4" NPT (female) pressure connections, silicon sensor, with aluminum/plastic/glass/RTV wetted parts. Suitable for sensing of dry air and inert gases. Optional plastic barb fittings available (Kit 62169-19). Ambient temperature range -22°F to 122°F (-30°C to 50°C)

Model	Differential Pressure Range (1)		Differential Over Range Pressure (2)		Working Pressure (3)	
	psid ("wcd)	bar/(mbar)	psid	bar	psig	bar
K1	(0 to 5)	(12,4)	1	0,1	6	0,4
K2	(0 to 25)	(62,2)	20	1,4	100	6,9
K3	(0 to 80)	(199)	20	1,4	100	6,9
K4	0 to 5	(344,7)	30	2,1	100	6,9
K5	0 to 12	(827,4)	60	4,1	100	6,9
K6	0 to 35	2,41	100	6,9	100	6,9

DIFFERENTIAL PRESSURE (Stainless, suitable for wet media)

Sensor Type 4, 316 welded stainless steel diaphragms with 1/4" NPT (female) pressure connections

Model	Differential Pressure Range (1)		Differential Over Range Pressure (2)		Working Pressure (3)	
	psid	bar	psid	bar	psi	bar
W4	0 to 100	6,9	300	21	1800	124
W5	0 to 300	21	900	62	2750	190
W6	0 to 1000	69	2000	138	2750	190
W7	0 to 3000	207	3000	207	3250	224

(1) Range is defined as the range of differential pressure between process inputs for which the sensor will operate within specified functional tolerances

(2) Differential Over Range Pressure is defined as the maximum difference in pressure between the process inputs. Exceeding this pressure differential at any working pressure may permanently damage the sensor performance

(3) Working Pressure is defined as the maximum pressure at either process input. Exceeding this pressure at either process input individually or simultaneously may permanently damage the sensor performance

TEMPERATURE

Sensor Type 2, 0.25" OD sensor housing, 304 stainless steel, 100 ohm RTD temperature sensor. NOTE: Must order PF73 compression fitting or SA6213-348 union connection if threaded connection is required. Accessory thermowells are also available (see page 14)

Model	Temperature Range	Maximum Over Range	Description The value at which the sensor may experience irreversible damage
L1	-50 to 450°F (-45 to 232°C)	550°F (288°C)	Local sensor, 4" long
L2	-50 to 450°F (-45 to 232°C)	550°F (288°C)	Local sensor, 6" long
L3	-50 to 450°F (-45 to 232°C)	550°F (288°C)	Local sensor, 10" long
R1	-50 to 450°F (-45 to 232°C)	550°F (288°C)	Remote sensor, 6" long with 6' Teflon® extension wire
R2	-50 to 450°F (-45 to 232°C)	550°F (288°C)	Remote sensor, 6" long with 10' Teflon® extension wire
R3	-50 to 450°F (-45 to 232°C)	550°F (288°C)	Remote sensor, 6" long with 20' Teflon® extension wire
H1	-50 to 1000°F (-45 to 538°C)	1150°F (621°C)	Remote sensor, high temp., 2.5" long with 6' MI ext. wire
H2	-50 to 1000°F (-45 to 538°C)	1150°F (621°C)	Remote sensor, high temp., 2.5" long with 10' MI ext. wire
H3	-50 to 1000°F (-45 to 538°C)	1150°F (621°C)	Remote sensor, high temp., 2.5" long with 20' MI ext. wire
H4	-50 to 450°F (-45 to 232°C)	1150°F (621°C)	Remote sensor, 2.5" long with 6' MI ext. wire
H5	-50 to 450°F (-45 to 232°C)	1150°F (621°C)	Remote sensor, 2.5" long with 10' MI ext. wire
H6	-50 to 450°F (-45 to 232°C)	1150°F (621°C)	Remote sensor, 2.5" long with 20' MI ext. wire

HOW TO ORDER

Build a part number by selecting appropriate code for each feature category. Example: **D1A1B2NM446**

D	1	A	1	B	2	N	M446
Setting/ Indicating Method	Series Designation	Switch Rating/ Termination/ Power Supply	Sensor Type	Model	*O-Ring Material	Auxiliary Output	Miscellaneous Options

*Applicable only for pressure sensor type 1

D	1	A	1	B	2	N	M446
							(see next page)

ORDERING
CODE   **DESCRIPTION**

SETTING/INDICATION METHOD
D   User adjustable, digital indicating configuration

SERIES DESIGNATION
1   Designation for One Series product line with single switch output

SWITCH RATING/TERMINATION/POWER SUPPLY (ALSO SEE LIST OF OPTIONS)
A   MOSFET Open drain (collector) output with flying lead-wires
B   MOSFET Open drain (collector) output with terminal block (upper enclosure included)
C   13A VAC solid-state relay with terminal block (upper enclosure included)
D   5A VAC solid-state relay with 115 VAC internal power supply and terminal blocks
           (upper enclosure included, dual conduit ports standard)
E   5A VAC solid-state relay with 230 VAC internal power supply and terminal blocks
           (upper enclosure included, dual conduit ports standard)

SENSOR TYPE
1   Gauge pressure, 316 stainless steel 1/2" NPT (female) pressure connection, ceramic sensor
2   Temperature Sensor (Thermowell Information: see page 14)
3   Differential pressure (dry air), silicon sensor, 1/4" NPT (female) pressure connections, 180° opposite
4   Differential pressure, 316 welded stainless steel diaphragms with 1/4" NPT (female) pressure connections
5   Sanitary pressure, 316L stainless steel, 1 1/2" or 2" Tri-Clamp® connection

MODEL RANGE
A-H   Pressure, NPT
T1-T9   Pressure, sanitary
K1-K6   Differential pressure, dry
W4-W7   Differential pressure, stainless
L1-L3   Temperature, local
R1-R3   Temperature, remote/teflon
H1-H6   Temperature, remote/MI

O-RING MATERIAL (SENSOR TYPE 1 ONLY)
0   Viton®; media temperature 0 to 257°F (-17 to 125°C)
1   Aflas®; media temperature 32 to 200°F (0 to 93°C)
2   Buna N; media temperature -22 to 257°F (-30 to 125°C)
3   EPR; media temperature -22 to 257°F (-30 to 125°C)
4   Kalrez®; media temperature 32 to 257°F (0 to 125°C)

AUXILIARY OUTPUT
N   None
A   4 to 20 mA analog process trending signal (sourcing output)

| D	1	A	1	B	2	N	M446
Setting/ Indicating Method	Series Designation	Switch Rating/ Termination/ Power Supply	Sensor Type	Model	*O-Ring Material	Auxiliary Output	Miscellaneous Options

*Applicable only for pressure sensor type 1.

D 1 A 1 B 2 N **M446**

MISCELLANEOUS OPTIONS

M025	5A up to 200 VDC, solid state relay output 20 mA min. load (switch rating "C" only, no agency approvals)
M026	13A VAC solid state relay with snubber for inductive switching (switch rating "C","D" and "E" only)
M027	VAC power supply with free contact solid state relay (switch rating "D" and "E" only)
M029	Low current (1.5 max.) VAC solid-state relay with free contacts (available on D and E only)
M031	Sourcing switch and IAW outputs for low-level VDC (available on D1A and D1B only)
M032	Free contact output for low-level VDC/VAC for units ordered with sourcing IAW VDC output. 4-20 mA output is not available with this option (available on D1A and D1B only)
M033	Free contact output for low-level VDC/VAC for units ordered with 4-20 mA output. IAW output is not available with this option (available on D1A and D1B only)
M041	Secondary barrier for hazardous media (sensors types 1, 4 and 5 only)
M042	Miscellaneous setting (response time, non-standard units of measure)
M201	Factory set parameters (set point, deadband and switch operating mode)
M205	Scale 4 to 20 mA output (Factory configured. Customer must specify upper and lower range limits)
M270	Display and nameplate units of measure in degrees C (temperature units only)
M276	Display and nameplate units of measure in mbar or bar (pressure units only. See "DISPLAY RESOLUTION" for availability)
M277	Display and nameplate units of measure in kPa or mPa (pressure units only. See "DISPLAY RESOLUTION" for availability)
M278	Display and nameplate units of measure in kg/cm2 (pressure units only. See "DISPLAY RESOLUTION" for availability)
M440	Cover chain
M444	Paper tag
M446	Stainless steel tag
M550	Oxygen service cleaning; (includes Viton® O-ring, sensors types 1, 4 and 5 only)
M905	1/2" NPT(female) dual conduit entry (switch rating "C" only, standard on "D" and "E")
L100	10 feet long cable assembly (switch rating "A" only)
L200	20 feet long cable assembly (switch rating "A" only)
62169-19	3/16" plastic barb fitting kit (sensor type 3 only)
PF73	1/2" NPT compression fitting kit (temperature models L1-L3 only)
SA6213-348	1/2" union connector kit (temperature models R1-R3 and H1-H6 only)
62169-27	Lexan replacement cover kit

THERMOWELLS (FOR TEMPERATURE SENSOR TYPE 2)
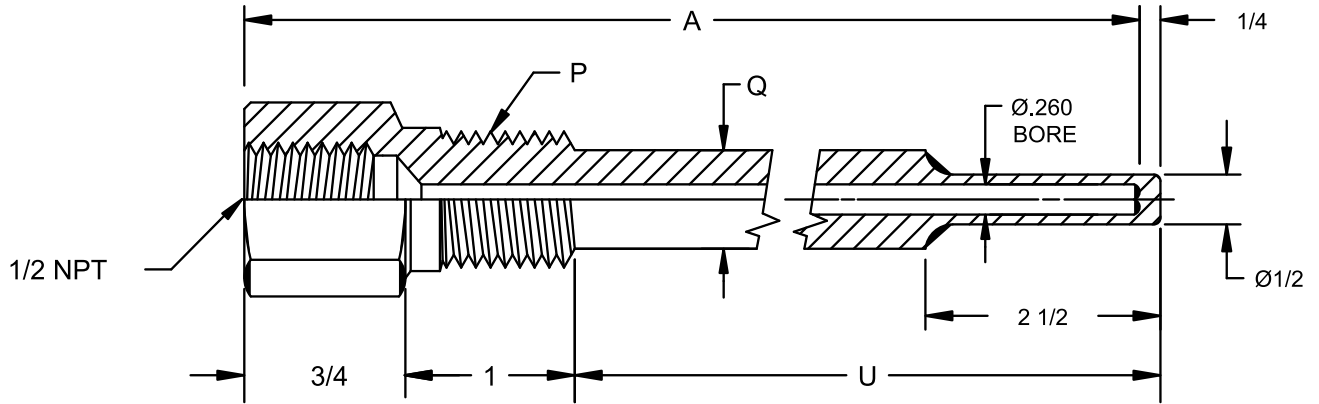
U.E. CATALOG P/N	P	A	Q	U	MATERIAL
1S260 L4-316	1/2 NPT	4	–	2 1/2	316 S/S
1S260 L5.5-316	1/2 NPT	5 1/2	Ø5/8	4	316 S/S
1S260 L6-316	1/2 NPT	6	Ø5/8	4 1/2	316 S/S
1S260 L6.5-316	1/2 NPT	6 1/2	Ø5/8	5	316 S/S
1S260 L9-316	1/2 NPT	9	Ø5/8	7 1/2	316 S/S
1S260 L9.5-316	1/2 NPT	9 1/2	Ø5/8	8	316 S/S
1S260 L12-316	1/2 NPT	12	Ø5/8	10 1/2	316 S/S
1S260 L15-316	1/2 NPT	15	Ø5/8	13 1/2	316 S/S
1S260 L18-316	1/2 NPT	18	Ø5/8	16 1/2	316 S/S
1S260 L24-316	1/2 NPT	24	Ø5/8	22 1/2	316 S/S
2S260 L4-316	3/4 NPT	4	–	2 1/2	316 S/S
2S260 L6-316	3/4 NPT	6	Ø3/4	4 1/2	316 S/S
2S260 L9-316	3/4 NPT	9	Ø3/4	7 1/2	316 S/S
2S260 L12-316	3/4 NPT	12	Ø3/4	10 1/2	316 S/S
2S260 L15-316	3/4 NPT	15	Ø3/4	13 1/2	316 S/S
2S260 L18-316	3/4 NPT	18	Ø3/4	16 1/2	316 S/S
2S260 L24-316	3/4 NPT	24	Ø3/4	22 1/2	316 S/S

ONE SERIES D1 CLASSIC - CONFIGURATION SELECTION GUIDE

POWER AND SWITCH OPTIONS

Powering the One Series with 18-30 VDC:				
Switch Output Voltage Requirements	**Field Wiring Interface**	**One Series Switch Output Circuit Type**	**IAW® Switch Output Type**	**One Series Configuration #**
Up to 50 VDC or 50 VAC	Leadwires	Open Drain Sinking Output (100 mA, to 50 VDC)	Open Drain Sinking Output (100 mA, to 50 VDC)	D1A--
		Sourcing Output (100 mA, @ 18-30 VDC)	Sourcing Output (100 mA, @ 18-30 VDC)	D1A--M031
		Isolated Opto-MOS Relay, free contacts (100mA, to 50 VDC or VAC), 4-20 mA option not available		D1A--M032
		Isolated Opto-MOS Relay, free contacts (100mA, to 50 VDC or VAC), Sourcing 4-20 mA option available	Not Available	D1A--M033
	Terminal Block	Open Drain Sinking Output (100 mA, to 50 VDC)	Open Drain Sinking Output (100 mA, to 50 VDC)	D1B--
		Sourcing Output (100 mA, @ 18-30 VDC)	Sourcing Output (100 mA, @ 18-30 VDC)	D1B--M031
		Isolated Opto-MOS Relay, free contacts (100mA, to 50 VDC or VAC), 4-20 mA option not available		D1B--M032
		Isolated Opto-MOS Relay, free contacts (100mA, to 50 VDC or VAC), Sourcing 4-20 mA option available	Not Available	D1B--M033
Up to 200 VDC	Terminal Block	5 Amp VDC SSR, free contacts, 20 mA minimum load	Open Drain Sinking Output (100 mA, to 50 VDC)	D1C--M025
24 to 280 VAC	Terminal Block	13 Amp, VAC SSR, 24-280 VAC, free contacts, 150 mA minimum load		D1C--
		13 Amp VAC SSR with snubber circuit (for inductive loads), 24-280 VAC, free contacts, 150 mA minimum load		D1C--M026

| Powering the One Series with 115 VAC:				
Switch Output Voltage Requirements	**Field Wiring Interface**	**One Series Switch Output Circuit Type**	**IAW® Switch Output Type**	**One Series Configuration #**
Up to 280 VAC	Terminal Block	5 Amp VAC SSR @ 115 VAC, 150 mA minimum load, SSR input tied to 115 VAC power supply	Open Drain Sinking Output (100 mA, to 50 VDC)	D1D--
		5 Amp VAC SSR with snubber (for inductive loads) @ 115 VAC, 150 mA minimum load, SSR input tied to 115 VAC power supply		D1D--M026
		5 Amp VAC SSR, 24-280 VAC, 150 mA minimum load, free contact		D1D--M027
		I.5 Amp VAC SSR, 12-280 VAC, 10 mA minimum load, free contact		D1D--M029

Powering the One Series with 230 VAC:				
Switch Output Voltage Requirements	**Field Wiring Interface**	**One Series Switch Output Circuit Type**	**IAW® Switch Output Type**	**One Series Configuration #**
Up to 280 VAC	Terminal Block	5 Amp VAC SSR @ 230 VAC, 150 mA minimum load, SSR input tied to 230 VAC power supply	Open Drain Sinking Output (100 mA, to 50 VDC)	D1E--
		5 Amp VAC SSR with snubber (for inductive loads) @ 230 VAC, 150 mA minimum load, SSR input tied to 230 VAC power supply		D1E--M026
		5 Amp VAC SSR, 24-280 VAC, 150 mA minimum load, free contact		D1E--M027
		I.5 Amp VAC SSR, 12-280 VAC, 10 mA minimum load, free contact		D1E--M029

DIMENSIONAL DRAWINGS
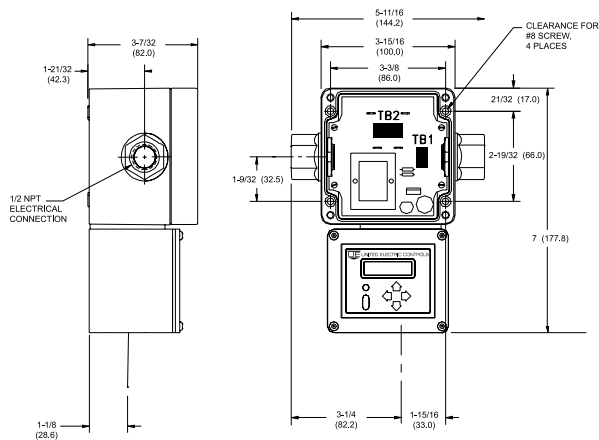
SWITCH RATING "A" CONFIGURATION
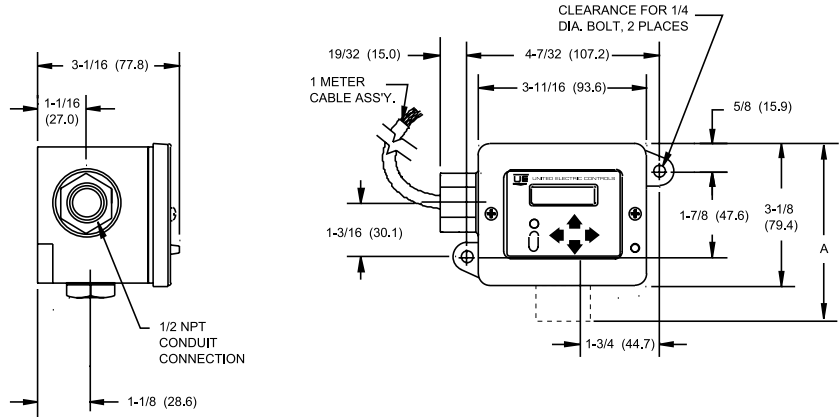
SWITCH RATING "B" & "C" CONFIGURATIONS
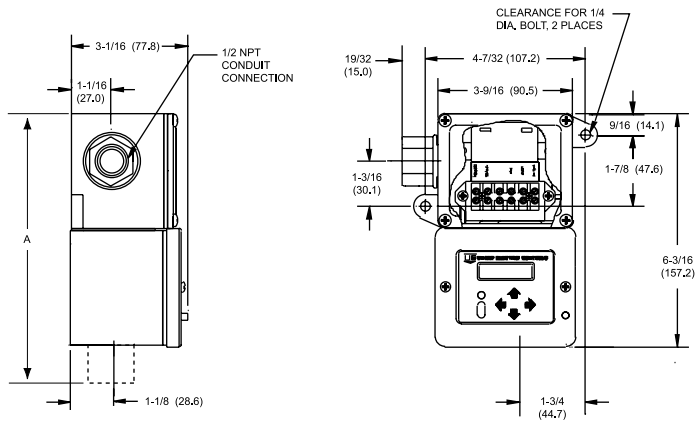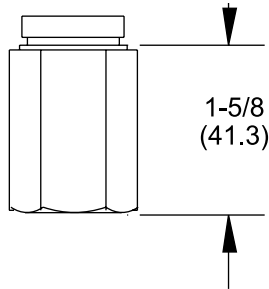

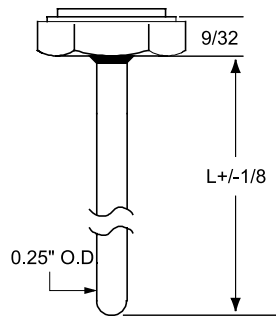**SWITCH RATING "D" and "E" CONFIGURATIONS**

DIMENSIONAL DRAWINGS

SENSOR DETAILS

Pressure Sensor

1-5/8
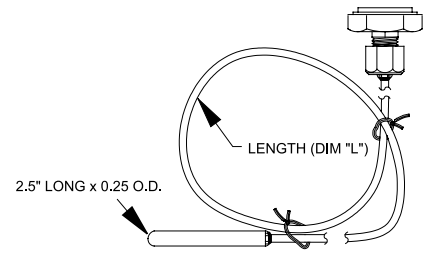(41.3)

1/2" NPT Process Connection

Local Temperature Sensor

9/32

L+/-1/8

0.25" O.D

MODEL	DIM "L" (IN.)
L1	4
L2	6
L3	10

High Temperature Remote Sensor

LENGTH (DIM "L")

2.5" LONG x 0.25 O.D.

MODEL	DIM "L" (FT.)
H1, H4	6
H2, H5	10
H3, H6	20

Low Temperature Remote Sensor

LENGTH (DIM "L")

6" LONG x 0.25 O.D.
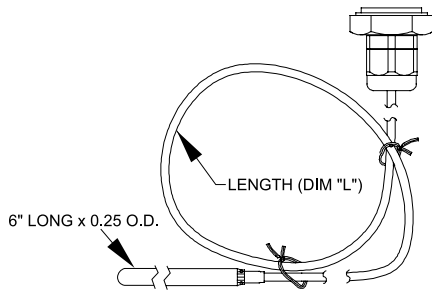
MODEL	DIM "L" (FT.)
R1	6
R2	10
R3	20

Differential Pressure Sensor Dry Media

HIGH LOW

1-7/8

3/8 (9.5)

2" SQ.
(50.8)
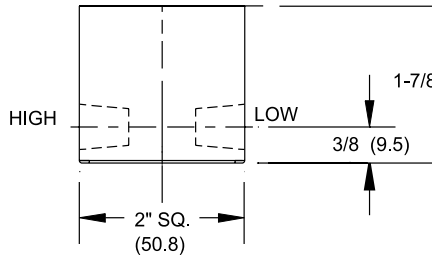
1/4" NPT Process Connections

Sanitary Sensor

1-11/16
(42.9)

P/N 62139-XX
RANGE 0-XXX psi

1-1/2" or 2"

Stainless Steel Differential Pressure Sensor

1-15/16 (49.4)

H L

2-1/2 (63.3)

3/4 (19.1)

M041 Secondary Seal

M041 OPTION

1-3/8 (35.1)

1/8" NPT

2" SQ.
(50.8)

Sensor (standard, sanitary or differential pressure)

One Series
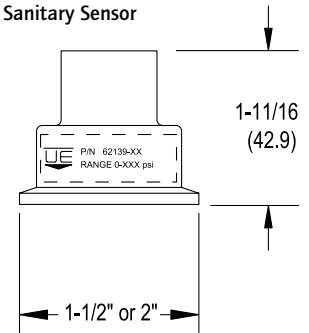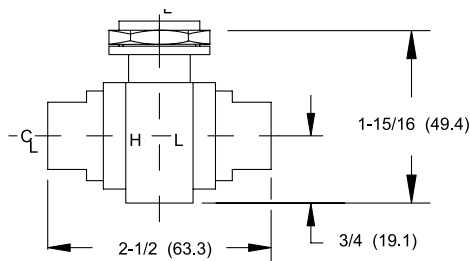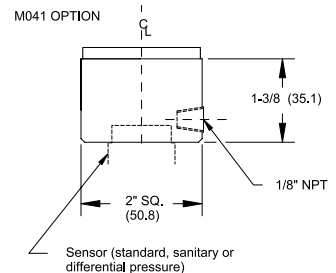
DISPLAY RESOLUTION

The resolution of the display is dependent on the pressure range and display units. The values below represent the number of digits to the right of the decimal point. Display resolution for temperature ranges is 0.

			Number of Decimal Places				
Sensor	Model	Range	psi	bar	kPa	MPa	kg/cm2
1	A	0 - 25 psi	2	2	1	n/a	2
1	B	0 - 50 psi	1	2	1	n/a	2
1	C	0 - 125 psi	1	2	0	n/a	2
1	D	0 - 250 psi	0	1	0	n/a	1
1	E	0 - 700 psi	0	1	0	n/a	1
1	F	0 - 1400 psi	0	1	0	n/a	1
1	G	0 - 2800 psi	0	0	n/a	2	0
1	H	0 - 4000 psi	0	0	n/a	2	0
3	K1	0 - 5" wcd	2 (wcd)	2 mbar	2	n/a	n/a
3	K2	0 -25" wcd	1 (wcd)	1 mbar	2	n/a	n/a
3	K3	0 -80 wcd	1 (wcd)	1 mbar	2	n/a	n/a
3	K4	0 - 5 psid	2	0 mbar	2	n/a	n/a
3	K5	0 - 12 psid	2	0 mbar	1	n/a	n/a
3	K6	0 - 35 psid	1	0 mbar	0	n/a	n/a
4	W4	0-100 psid	1	2	0	n/a	2
4	W5	0-300 psid	0	1	0	n/a	1
4	W6	0-1000 psid	0	1	0	n/a	1
4	W7	0-3000 psid	0	0	n/a	2	0
5	T1/T6	0-25 psi	2	2	1	n/a	2
5	T2/T7	0-50 psi	1	2	1	n/a	2
5	T3/T8	0-125 psi	1	2	0	n/a	2
5	T4/T9	0-250 psi	0	1	0	n/a	1
5	T5	0-600 psi	0	1	0	n/a	1

ALTERNATIVE PRODUCTS FROM UE

One Series Single, Dual and 2-Wire Electronic Pressure and Temperature Switches, with I Am Working Diagnostics Signal

- Solid-state reliability with health-checking diagnostics
- Available with innovative low power "2-Wire" model for discrete input to PLC's or DCS; or models to switch 115/230 VAC and 125 VDC loads
- Enclosure type 4X design, approved for Class I, Division 2 hazardous or Div. 1/Zone 0 intrinsically safe locations
- Digital display and tamper-proof keypad adjustment of set point and deadband
- Optional 4-20 mA analog output

120 Series Electromechanical Switches

- Wide selection of explosion-proof line of pressure, differential, pressure and temperature models
- UL, cUL, Cenelec EE xd certified for hazardous locations
- Single or dual switch outputs
- Internal or external set point adjustment

460 Series Pressure Transmitters

- Welded, #316 Stainless steel construction
- CSA, NRTL/C, Cenelec EE xd certified for hazardous locations
- Ranges 0 to 15,000 psi
- Choice of field or factory-sealed zero and span calibration
- 4-20 mA or 0-4 VDC

117 SERIES Compact Electromechanical Switches

- Single Switch for Corrosive and Hazardous Divison 2 Locations
- Compact pressure, differential pressure and temperature models
- Hermetically-sealed SPDT and DPDT output
- Approved for Class I, Division 2 hazardous locations
- Epoxy-coated weather-tight design houses stainless steel internal construction
- Convenient terminal block wiring

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 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 36 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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