



54 Series

54 Series

GENERAL SERVICE PRESSURE, VACUUM AND TEMPERATURE SWITCHES



FEATURES

- Compact Size
- Wide Selection of Adjustable Ranges from 30" Hg Vac to 6000 psi (-1 to 413 bar)
- Adjustable Temperature Ranges from -130 to 650° F (-90 to 340° C)
- Choice of One or Two Switch Outputs
- Adjustable or Narrow Deadband Options
- Reference Dial or Hex Screw-Type Setting

OVERVIEW

The 54 Series offers the OEM a combination of excellent performance and low cost. Available in pressure and temperature versions, with single or dual SPDT outputs and enclosed or open frame (skeleton) construction. The 54 Series family provides versatility for the design engineer.

The 54 has been field-proven in a wide variety of OEM applications, including medical, laboratory, fire protection and heating equipment.

FEATURES

- Compact size
- Wide selection of adjustable pressure ranges from 30" Hg Vac to 6000 psi (-1 to 413 bar)
- Adjustable temperature ranges from -130 to 650° F (-90 to 340° C)
- Choice of one or two switch outputs
- Adjustable or narrow deadband
- Reference dial or hex screw-type setting
- Optional 1/2" NPT male by 1/8" NPT female polysulphone pressure connection
- NEMA 1 or open frame (skeleton) versions for OEM applications



SPECIFICATIONS

STORAGE TEMPERATURE	-65 to 160°F (-54 to 71°C)
AMBIENT TEMPERATURE LIMITS	
Pressure Models	Models 610-614: -40 to 160°F (-40 to 71°C); Models 22-28: 0 to 160°F (-17 to 71°C)
Temperature Models	-40 to 160°F (-40 to 71°C)
SHOCK	Set point repeats after 15 G, 10 millisecond duration
VIBRATION	Set point repeats after 2.5 G, 5-500 CPS
ENCLOSURE CLASSIFICATION	Types C54, C54A, B54, F54, E54, J54, J54A, H54: complies with NEMA 1 requirements. Types C54S, B54S, F54S, E54S, J54S, J54AS, H54S: not applicable
SET POINT REPEATABILITY	
Pressure Models	Models 22-28: ± 1% of adjustable range; Models 610-614: ± 1.5% of adjustable range
Temperature Models	± 1% of adjustable range
SWITCH OUTPUT	One or two SPDT; dual switch may be separated up to 100% of range; switches may be wired "normally open" or "normally closed"
ELECTRICAL RATING	15A 125/250/480 VAC resistive
ENCLOSURE MATERIAL	Lexan® black finish
WEIGHT	Approximately 12 oz.
ELECTRICAL CONNECTION	Types J54 & H54, C54, C54A, B54, E54, F54: 7/8" diameter hole; Type J54A: 1/16" diameter
PRESSURE CONNECTION	Models 22-28: 1/4" NPT male; 610 - 614: 1/4" NPT female
BULB AND CAPILLARY	6 ft. copper or stainless steel
IMMERSION STEM	Brass
TEMPERATURE FILL	Non-toxic oil
TEMPERATURE DEADBAND	Typically 1% of range under laboratory conditions (70°F circulating bath at rate of 1/2°F per minute change)
MOUNTING	Types B54S, C54S, E54S, F54S, J54S, J54AS & H54S: Skeleton Holes for surface mounting; Types B54, C54, C54A, E54, F54, J54, J54A & H54: Vertical rear mounting ears

APPROVALS



Types J54, J54A & H54: UL 508 listed, File # E42272
Types J54S, J54AS & H54S: UL 508 recognized, File # E42272
Optional CSA certified C22.2 no. 14, File # LR7814

Types B54, C54, C54A, F54, E54: UL 873 listed, File # 10667;
Types B54S, C54S, F54S, E54S: UL 873 recognized, File # 10667;
CSA certified C22.2 no. 24, File # LR7814

CE Compliance with Low Voltage Directive (LVD)

PRESSURE MODEL CHART

Model	Stock #	Adjustable Set Point Range		Deadband		Proof Pressure		Over Range Pressure				
		psi	bar	psi	bar	psi	bar	psi	bar			
J54 J54A J54S J54AS												
Buna N diaphragm and O-ring with 1/4" NPT male aluminum pressure connection; limited to process temperature below 200°F												
22	9630	–	9704	–	30" Hg Vac to 0	-1 to 0	1 to 3.5" Hg Vac	1 to 3.5" Hg Vac	50	3,4	0	0
24	9637	–	9711	9968	3 to 30	0,2 to 2	0.4 to 1.25	0.5 to 4		200	13,7	50
25	9644	–	9718	–	10 to 100	0,7 to 6,9	1 to 2.5	1 to 7	above	above	100	6,9
27	–	–	–	–	30 to 300	2 to 20,5	1.3 to 4	1.3 to 7.5	set point	set point	above	above
28	–	–	–	–	50 to 500	3,4 to 34,5	1.5 to 5	1.5 to 8		Max 600		Max 41
set point set point												
J54 J54S												
303 stainless steel piston and Buna N O-ring with 1/4" NPT female pressure connection (not recommended for gas service since drying of the O-ring can allow bleeding of the medium into the atmosphere)												
610	–	NA–	NA		75 to 1000	6 to 69	30 to 150	2,07 to 10,34	10,000	689	6000	413
612	–	NA–	NA		125 to 3000	9 to 207	40 to 250	2,76 to 17,24	10,000	689	6000	413
614	–	NA–	NA		700 to 6000	49 to 413	50 to 400	3,45 to 27,58	10,000	689	6000	413
H54 H54S												
Buna N diaphragm and O-ring with 1/4" NPT male aluminum pressure connection; limited to process temperatures below 200°F												
22	9502	–			30" Hg Vac to 0	-1 to 0	1.5 to 3.5" Hg Vac	0,05 to 0,12	50	3,4	0	0
24	9509	–			3 to 30	0,2 to 2	0.4 to 1.25	0,03 to 0,09	200	13,7	50	3,4
25	9516	9834			10 to 100	0,7 to 6,9	1 to 2.5	0,07 to 0,17	above	above	100	6,9
27	9523	–			30 to 300	2 to 20,5	1.6 to 4	0,11 to 0,28	set point	set point	above	above
28	–	–			50 to 500	3,4 to 34,5	2.5 to 5.0	0,17 to 0,34	Max 600	Max 41	set point	set point

TEMPERATURE MODEL CHART

Model	Stock #	Adjustable Set Point Range		Max. Temperature		Scale Division		Stem Size		
		°F	°C	°F	°C	°F	°C	NPT x BT (inches)		
C54 C54S C54A										
Brass immersion stem										
103	9135	–	–	0 to 225	-15 to 110	250	120		3/8 x 2 1/8	
109	–	–	–	200 to 425	95 to 220	425	220		3/8 x 2 1/8	
B54 B54S										
Brass immersion stem										
103	9040	9201		0 to 225	-15 to 100	250	120	10	5	3/8 x 2 1/8
109	9047	–		200 to 425	95 to 220	425	220	10	5	3/8 x 2 1/8
F54 F54S										
Copper bulb and capillary										
Sensing Bulb Size										
OD x Length										
D20BC	–	NA		-130 to 120	-90 to 50	170	75			3/8 x 4 1/2
D21BC	–	–		0 to 150	-15 to 65	200	90			3/8 x 6 7/8
D22BC	–	–		50 to 300	10 to 150	350	175			3/8 x 4 1/2
D23BC	–	–		150 to 650	70 to 340	700	370			3/8 x 3 5/8
Stainless steel bulb and capillary										
D21BS	–	–		0 to 150	-15 to 65	200	90			3/8 x 6 7/8
D22BS	–	–		50 to 300	10 to 150	350	175			3/8 x 4 1/2
D23BS	–	–		150 to 650	70 to 340	700	370			3/8 x 3 5/8
E54 E54S										
Copper bulb and capillary										
D20BC	–	NA		-130 to 120	-90 to 50	170	75	10	5	3/8 x 4 1/2
D21BC	9333	–		0 to 150	-15 to 65	200	90	5	5	3/8 x 6 7/8
D22BC	9347	–		50 to 300	10 to 150	350	175	10	5	3/8 x 4 1/2
D23BC	–	–		150 to 650	70 to 340	700	370	25	10	3/8 x 3 5/8
Stainless steel bulb and capillary										
D20BS	–	NA		-130 to 120	-90 to 50	170	75	10	5	3/8 x 4 1/2
D21BS	–	–		0 to 150	-15 to 65	200	90	5	5	3/8 x 6 7/8
D22BS	–	–		50 to 300	10 to 150	350	175	10	5	3/8 x 4 1/2
D23BS	–	–		150 to 650	70 to 340	700	370	25	10	3/8 x 3 5/8

HOW TO ORDER

BUILDING A PART NUMBER

Select a type

Refer to the "Type" section below.

Determine type number based on switch output, enclosure, adjustment and reference.

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

Select a Model

Refer to the "Model Charts."

Determine model or stock number based on adjustable range, deadband and proof pressure.

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

Select an Option

Refer to the "Options" section.

Determine option number based on switch output, optional materials or other product enhancements.

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

Leave "option" portion blank if no options are needed. FOR MULTIPLE OPTIONS: Call United Electric Controls.

TYPE

J54:
J54A:
H54:
J54S:
J54AS:
H54S:

DESCRIPTION – PRESSURE MODELS

NEMA 1 enclosure; One SPDT output; internal hex adjustment with no reference dial
NEMA 1 enclosure; Two SPDT outputs; internal hex adjustment with no reference dial
NEMA 1 enclosure; One SPDT output; internal adjustment with reference dial
Skeleton construction; One SPDT output; internal hex adjustment with no reference dial
Skeleton construction; Two SPDT outputs; internal hex adjustment with no reference dial
Skeleton construction; One SPDT output; adjustment with reference dial

TEMPERATURE MODELS

C54:
C54A:
B54:
F54:
E54:
C54S:
B54S:
F54S:
E54S:

NEMA 1 enclosure; Immersion stem; one SPDT output; internal adjustment with no reference dial
NEMA 1 enclosure; Immersion stem; two SPDT outputs; internal adjustment with no reference dial
NEMA 1 enclosure; Immersion stem; one SPDT output; internal adjustment with no reference dial
NEMA 1 enclosure; Bulb and capillary; one SPDT output; internal adjustment with no reference dial
NEMA 1 enclosure; Bulb and capillary; one SPDT output; internal adjustment with reference dial
Skeleton construction; Immersion stem; one SPDT output; adjustment with no reference dial
Skeleton construction; Immersion stem; one SPDT output; adjustment with reference dial
Skeleton construction; Bulb and capillary; one SPDT output; adjustment with no reference dial
Skeleton construction; Bulb and capillary; one SPDT output; adjustment with reference dial

SWITCH OPTIONS

CODE

DESCRIPTION

0500	Close deadband, 5A 125/250 VAC resistive NOT AVAILABLE ON B54, B54S, C54, C54S
1520	Adjustable deadband, 15A 125/250/277 VAC resistive. Adjustable wheel changes rise setting only. If adjustment of fall setting is required, use primary adjustment. NOT AVAILABLE ON TYPES J54A, J54AS, C54A, C54, C54S, B54, B54S, E54, E54S, F54, F54S & PRESSURE MODELS 610-614
1530	External manual reset, 15A 125/250/480 VAC resistive; reset on increasing pressure or temperature. NOT AVAILABLE ON SKELETON TYPES J54A, J54S, J54AS, H54S, B54S, C54A, C54S, E54S, F54S OR MODELS 610-614
2000	20A 125/250 VAC resistive

GENERAL OPTIONS	M201	Factory set one switch; specify increasing or decreasing pressure or temperature and set point
	M202	Factory set two switches; specify increasing or decreasing pressure or temperature and set point. NOT AVAILABLE ON TYPES J54, J54S, H54, H54S, B54, B54S, C54, C54S, E54, E54S, F54, F54S
	M270	Calibrated dial in Celsius. NOT AVAILABLE ON TYPES B54, B54S, C54, C54S, C54A, F54, F54S
	M276.	Range indicated on nameplate in bars
	M278	Range indicated on nameplate in kg/cm ²
	M444	Paper ID tag
	M446	Stainless steel ID tag & wire attachment (attachment location will vary depending on product)
	M540	Viton construction (deadbands and low end range may increase slightly. Consult factory); Wetted parts include Viton diaphragm and O-ring plus standard connection material

PRESSURE

CONNECTION OPTIONS	M501	Polysulphone pressure connection 1/2" NPT male x 1/8" NPT female
---------------------------	------	--

UNION

CONNECTORS FOR REMOTE MOUNT TEMP.	W027	1/2" NPT with 3/4" bushing, brass
	W028	1/2" NPT with 3/4" bushing, 304 stainless steel
	W051	1/2" NPT, brass
	W050	1/2" NPT, 304 stainless steel
	W045	3/4" NPT, brass
	W046	3/4" NPT, 304 stainless steel

SEPARABLE WELLS, REMOTE TEMP.

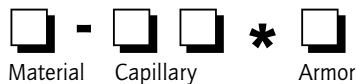
W075	Brass 1/2" NPT with 3/4" bushing adapter x 4" BT
W118	Brass 1/2" NPT with 3/4" bushing adapter x 7" BT
W191	Brass 1/2" NPT x 4" BT
W192	Brass 1/2" NPT x 7" BT
W076	304 Stainless steel 1/2" NPT with 3/4" bushing adapter x 4" BT
W119	304 Stainless steel 1/2" NPT with 3/4" bushing adapter x 7" BT
W193	304 Stainless steel 1/2" NPT x 4" BT
W177	304 Stainless steel 1/2" NPT x 7" BT

SEPARABLE WELLS, * IMMERSSION STEM TEMP.

W141	1/2" NPT x 1 9/16" BT, brass
W146	1/2" NPT x 1 9/16" BT, 304 stainless steel

OPTIONAL CAPILLARY MATERIAL, LENGTH, AND SLEEVE PROTECTION MATERIAL

Example:



Material

S= 304 stainless steel capillary is standard for most products.
C= Copper capillary.

Capillary length

Capillary length. Consult UE on repeatability and ambient effects on capillary lengths greater than thirty feet.
06, 10, 15
20, 25, 30

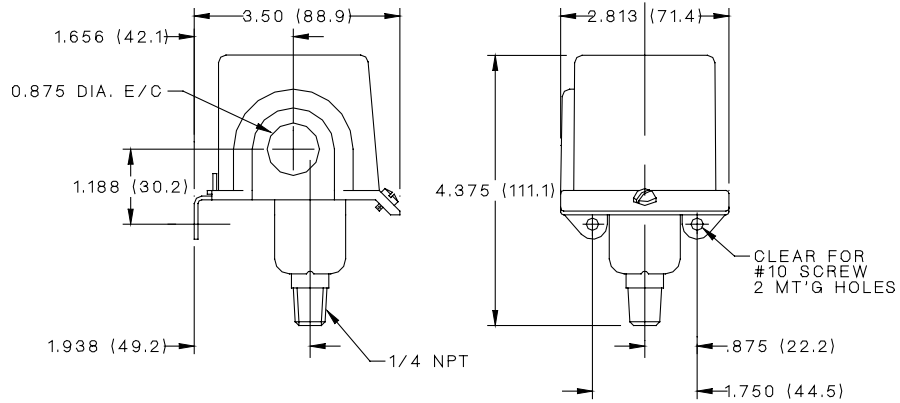
Armor

0= None
1= Stainless steel armor

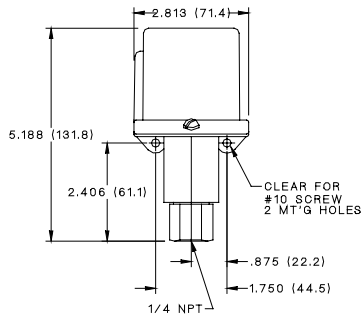
*NOTE: Stainless steel wells are solid-bore; Brass wells are fabricated.

DIMENSIONAL DRAWINGS

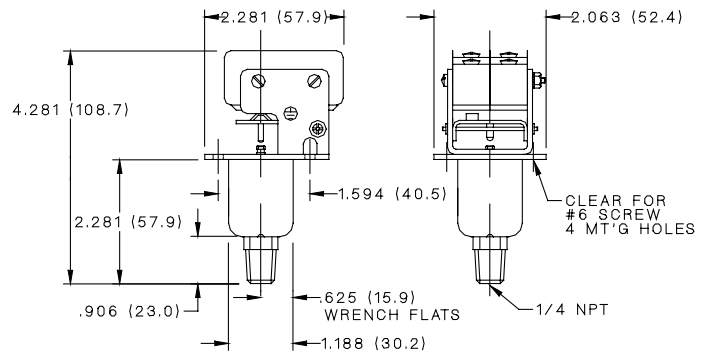
Pressure Models
Type H54, J54 and J54A models 22 - 28



Type J54 models 610 - 614



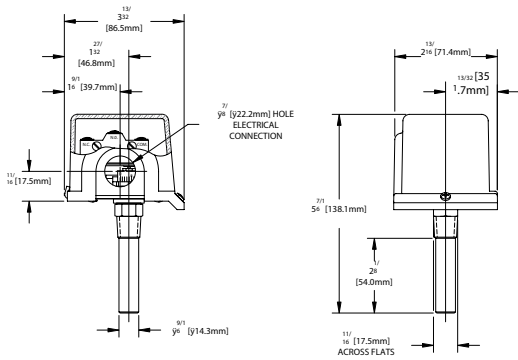
Type J54S models 22 - 28



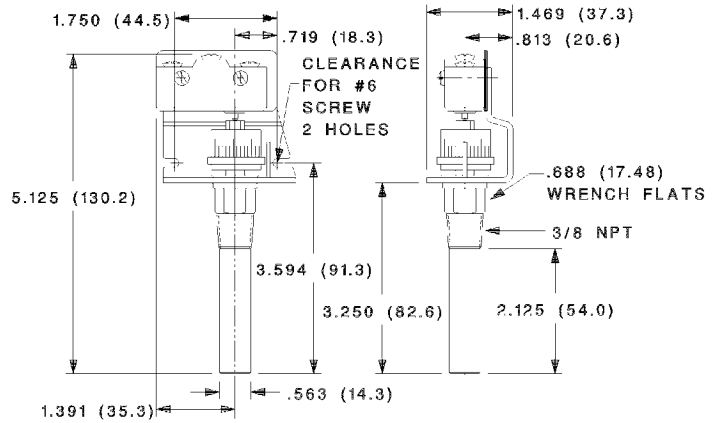
DIMENSIONAL DRAWINGS

Temperature Models

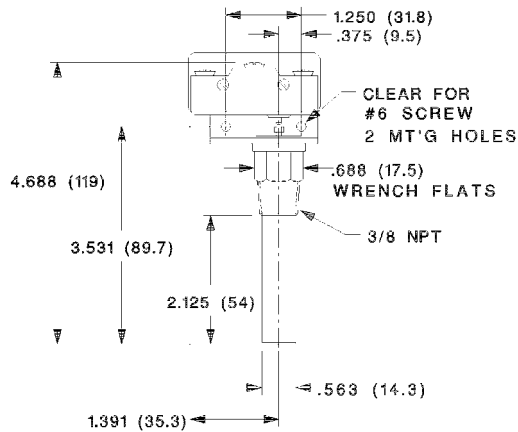
Types B54, C54 and C54A



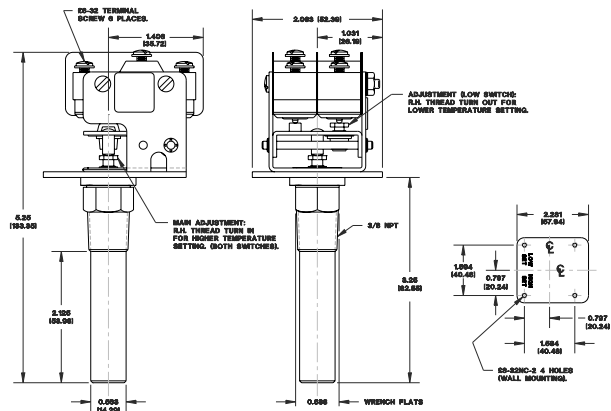
Types B54S



Type C54S

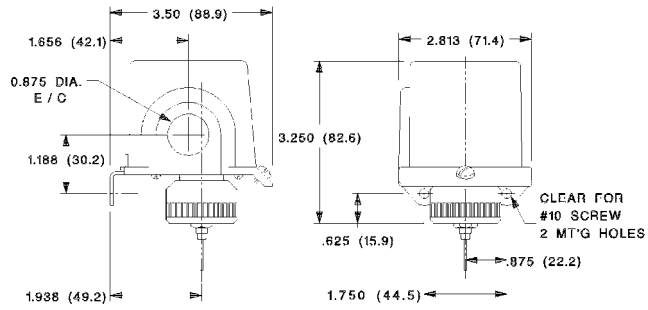


Type C54AS

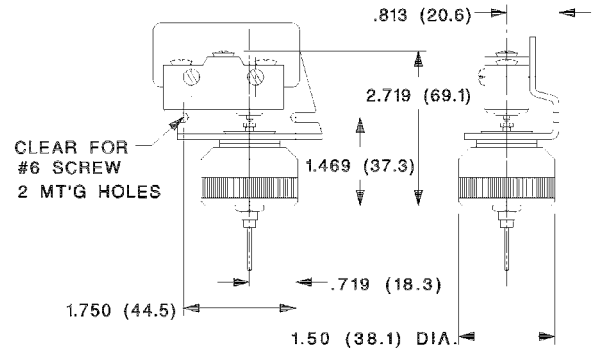


All dimensions stated in inches (millimeters)

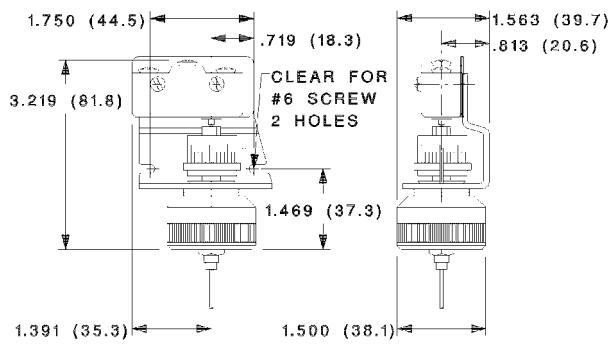
Types E54 and F54



Type F54S



Type E54S



RECOMMENDED PRACTICES AND WARNINGS

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

- To avoid damaging unit, proof pressure and maximum temperature limits stated in literature and on nameplates must never be exceeded, even by surges in the system. Operation of the unit up to maximum temperature is acceptable on a limited basis (i.e., start-up, testing) but continuous operation must be restricted to the designated adjustable range. Excessive cycling at maximum temperature limits could reduce sensor life.
- A back-up unit is necessary for applications where damage to a primary unit could endanger life, limb or property. A high or low limit switch is necessary for applications where a dangerous runaway condition could result.
- The adjustable range must be selected so that incorrect, inadvertent or malicious setting at any range point cannot result in an unsafe system condition.
- Install unit where shock, vibration and ambient temperature fluctuations will not damage unit or affect operation. Orient unit so that moisture does not enter the enclosure via the electrical connection. When appropriate, this entry point should be sealed to prevent moisture entry.
- Unit must not be altered or modified after shipment. Consult UE if modification is necessary.
- Monitor operation to observe warning signs of possible damage to unit, such as drift in set point or faulty display. Check unit immediately.
- Preventative maintenance and periodic testing is necessary for critical applications where damage could endanger property or personnel.
- For all applications, a factory set unit should be tested before use.
- Electrical ratings stated in literature and on nameplate must not be exceeded. Overload on a switch can cause damage, even on the first cycle. Wire unit according to local and national electrical codes, using wire size recommended in installation sheet.
- 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 (F.O.B. UE Watertown); provided, however, that this warranty applies only to equipment found to be so defective within a period of 18 months from the date of manufacture by the Seller. 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.

LIABILITY LIMITATION

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

UE specifications subject to change without notice.

