

Data Sheet

UE PRODUCT OVERVIEW

SAFETY, ALARM & EMERGENCY SHUTDOWN



















Over 90 Years of Customer-Driven, Reliable Solutions

First WirelessHART Toxic or Combustible Gas Detector

UE partnered with key customers to develop the VanguardTM wireless, fixed-point gas detector to address the challenge of expanding gas detection coverage in locations that lacked power and signal wire infrastructure. Using WirelessHART, the Vanguard can be quickly installed in O&G extraction and production facilities, terminals, and storage facilities without the need for wiring or trenching.





First SIL 2 Integrated Smart Switch with Transmitter, Safety Relay, Trip Alarm & Logic Solver

As Safety Instrumented Systems (SIS) grew beyond the process plant into field applications, operators often lacked the infrastructure to support a safety system. UE developed the SIL-certified One Series Safety transmitter to allow direct control of a final element without the need for a SIL-certified SCADA, PLC, or RTU, while also supplying the data needed from a 4-20 mA transmitter.

Only Loop Powered Electronic Switch with Plugged Port Detection

UE designed its electronic switches with integrated functions like trip delay, trip filter and plugged port detection. The plugged port detection feature addresses a common instrumentation challenge: when pressure switches become plugged due to process debris or build up, or when a block and bleed valve is accidently left closed after maintenance. This could leave operators blind to the actual process conditions. The patented diagnostics within the One Series detect a plugged port quickly and alert the operator to clear the port. This results in increased operational uptime and accurate process and safety monitoring.









Contents

PRODUCTS	DESCRIPTION	PAGE
Gas Detection		
TCD50, TCD60	Vanguard Wireless HART Gas Detector	4
Hazardous Location		
One Series	Safety Transmitter with Safety Relay Output, Electronic Pressure & Temperature SmartSwitches & Transmitters	5
12 Series	Compact, Stainless Steel, SIL Certified Pressure & Temperature Switches	6
117 Series	Division 2 Pressure & Temperature Switches	6
120 Series	SIL Certified Division 1 Mechanical Pressure & Temperature Switches	7
820 Series	Division 1 Temperature Switch with Local Indicator	7
Ordinary Location /		
Weather-Tight (NEMA 4X)		
Excela	2-wire Electronic Pressure & Temperature Switch	8
100 Series	SIL Certified General Purpose/Weather-Tight Pressure & Temperature Switches	8
400 Series	FM approved Multi-Output Pressure & Temperature Switches	9
J6 and J21K Series	Weather-Tight Pressure & Differential Pressure Switches	9
OEM Switches		
54 Series	Economical Pressure, Vacuum & Temperature Switches	10
J40 Series	Open-Frame/Skeleton Pressure Switches	10
10 Series	Compact, Customizable Cylindrical Pressure Switches	11
24 Series	Compact Differential Pressure Switches	11
Temperature Switches & Ser	nsors	
800 Series	Temperature Indicating Switches and Monitors	12
55 Series	Temperature Switches & Thermostats	12
Temperature Sensors	Thermocouples, RTDs, Thermistors and Accessories	12
Selection Guide		
	Quick Selection Guide by Product Series	13
	Certification Guide by Product Series	14-15



UE Products have been used with the following applications and equipment

Wellhead monitoring	
Gas flow monitoring	
CO2 injection skids	
Leak detection	
Hydraulic monitoring	
BOP accumulators	
Seal pots	
Fence line monitoring	
Isolation rings	
Tubing and casing	
Rupture disk monitoring	

Instrument panels
Fire suppression systems
Chemical feed pumps
Separator system control
Line heater control
Tank level
Purge cabinets
Digesters
Engine stop/start
Effluent monitoring
Lube oil monitoring

Heat tracing
Stack emissions
Pump protection
Manifold monitoring
Pipeline integrity
Sterilizers
Bag house monitoring
Safety systems
Boiler tube monitoring
Bearing temperature monitoring

3

info@able.co.uk









Vanguard WirelessHART Gas Detector

TCD50 (Base transmitter for Gr C & D / IIB zones)
TCD60 (Base transmitter for Gr A,B,C & D / IIC zones)









- Toxic or combustible gas monitoring
- Deploy where power is limited
- Eliminates "blind spots" in your wired system
- Improves safety in difficult-to-reach areas
- Reduces installed cost by >50%
- Installs in <1 hour
- Simplifi es project engineering
- 5-year battery life field replaceable











One Series SIL 2 Safety Transmitter with Safety Relay Output

Explosion-proof electronic vacuum, pressure, differential pressure and temperature smart switch and transmitter





Advantages:

- NAMUR NE 43 4-20 mA output. Embedded sensor, logic solver, high-capacity solid-state safety relay, and display reduces complexity
- Simple installation where infrastructure is limited, and in difficult-to-reach applications
- SIL logic solver functions as trip alarm without additional equipment
- Pressure or temperature safety function
- SIL 2 certified, SIL 3 capable
- Ranges to 6,000 psi (414 bar), 200 psid (14 bar), 1,000 °F (538 °C)





One Series SIL 2 Electronic Switches, and Transmitter+Switch

Explosion-proof electronic vacuum, pressure, differential pressure and temperature smart switch







Advantages:

- Replace electromechanical switches for cost-effective upgrades using existing wires
- Self diagnostics enables predicti ve maintenance strategies
- Display and keypad provide easy, fast and secure field programming of set point and deadband
- NAMUR standard and HART enabled smart switch and transmitter for process monitoring, alarm, and emergency shutdown
- Provides precise on-off control in Window Mode configuration
- SIL 2 certified, SIL 3 capable
- Ranges to 6,000 psi (414 bar), 200 psid (14 bar), 1,000 °F (538 °C)



5

Registered Address

info@able.co.uk









Explosion-proof, dual seal, 316 stainless steel, vibration-resistant pressure, vacuum, differential pressure and temperature electromechanical switch







Advantages:

- Dual seal compliant to ANSI 12.27.01 standards and NEC 501.17
- Corrosion-resistant 316 stainless steel construction
- Snap-acting Belleville spring for vibration resistance and set point stability
- Convenient field setting and adjustment
- Hermetically sealed SPDT or DPDT switches
- SIL 2 certified, SIL 3 capable
- Ranges to 12,500 psi (862 bar), 150 psid (10 bar d), 650 °F (343 °C)

117 Series

Explosion-proof Class I, Div. 2, Zone 2 rated pressure, vacuum, differential pressure and temperature electromechanical switches



Advantages:

- Hazardous location approvals for Class I, Div. 2, Zone 2
- Hermetically-sealed snap switch, SPDT or DPDT outputs
- Welded stainless steel diaphragm or bellows sensors
- Epoxy-coated type 4X enclosure with captive cover screws
- Terminal block wiring
- Ranges to 3,500 psi (241 bar), 500 psid (35 bar d), 640 °F (338 °C)

6

Registered Address

ABLE Instruments & Controls Ltd Cutbush Park, Danehill, Lower Earley, Reading, Berkshire, RG6 4UT. UK.

Phone +44 (0)118 9311188 **Email**

info@able.co.uk

Web able coluk E-commerce









Explosion-proof pressure, vacuum, differential pressure and temperature electromechanical switch with worldwide agency certifications





Advantages:

- Provides primary or secondary (diverse, redundant technology) for safety, alarm and emergency shutdown functions
- Single SPDT or DPDT or dual SPDT outputs
- · Choice of internal or external adjustment
- Wide selection of sensor materials and ranges
- Wide adjustable deadband models
- Easy to wire via dual electrical conduit openings and terminal block
- Heat tracing models
- SIL 2 certified, SIL 3 capable
- Ranges to 6,000 psi (414 bar), 500 psid (35 bar d), 650°F (343°C)



820 Series

Explosion-proof indicati ng temperature electromechanical switch for industrial heating and cooling applications

Advantages:

- Indicating temperature control with remote stainless steel bulb and capillary
- Corrosion-resistant epoxy coated aluminium enclosure with Lexan® cover
- Single or dual SPDT switch outputs
- Division 1, explosion-proof models for hazardous locations
- Set point repeatability and indication accuracy ± 1%
- Ranges to 650°F (343°C)



7

info@able.co.uk







Excela™

2-wire electronic switch for upgrading legacy instrumentation systems (alarm & shutdown) to improve maintenance, operational and cost efficiency

Advantages:

- Two wire design allows for easy host system integration and lower setup costs
- Easy local programming and integrated functions (e.g., trip filter, passcode) for better control
- LCD display and LED indicator lights for visual status of operational performance
- Rugged, electronic relay design and device diagnostics that improves device reliability
- 316L stainless steel wetted materials
- Ranges to 6,000 psi (414 bar); 200 psid (14 bar d), 1,000°F (538 °C)



100 Series

Single switch, weather-tight, pressure, vacuum, differential pressure, and temperature electromechanical switch

Advantages:

- Wide variety of pressure sensors for media compatibility
- Epoxy-coated enclosure, designed to meet enclosure type 4X requirements
- Pump switch models with wide adjustable deadband
- amper-resistant set point "lock"
- Heat tracing models
- SIL 2 certified, SIL 3 capable
- Ranges to 5,000 psi (345 bar), 500 psid (35 bar d), 650
 °F (343 °C)



info@able.co.uk









FM approved multi-switch, weather-tight pressure, vacuum, differential pressure, and temperature electromechanical switch

Advantages:

- One, two or three switch outputs may be separated up to 100% of range
- Epoxy-coated enclosure, designed to meet enclosure type 4X requirements
- Choice of reference dial or multi-turn hex screw for set point adjustment
- Wide selection of ranges including low pressure models with narrow deadbands
- Ranges to 6,000 psi (414 bar), 200 psid (14 bar d), 650 °F (340°C)



J6 & J21K Series

Industrial pressure and differential pressure switch with metal bellows sensor

Advantages:

- Reliable, metal bellows sensors
- Welded 316 stainless steel models
- Epoxy-coated enclosure, meeting enclosure 4X requirements
- Single switch (SPDT) output
- J6 (straight pressure) ranges to 6,000 psi (414 bar)
- J21K (differential pressure) ranges to 90 psid (6 bar d)



9

Registered Address

info@able.co.uk







Economical pressure, vacuum and temperature electromechanical switch for OEMs





Advantages:

- Multi ple models and opti ons provide OEM design versatility
- Reference scale or multiple-turn hex adjustment versions
- NEMA 1 Lexan® enclosure or open frame (skeleton) design
- Choice of single or dual SPDT switch outputs
- Ranges to 6,000 psi (414 bar), 650 °F (343 °C)



J40 Series

Skeleton (open frame) pressure electromechanical switch with metal bellows sensor for OEMs

Advantages:

- Compact, open frame (skeleton) design for OEM applications
- Brass or phosphor bronze metal bellows sensors
- Easy external adjustment
- Single switch (SPDT) output
- Optional adjustable deadband switch
- Ranges to 300 psi (21 bar)



10

Registered Address

info@able.co.uk







Compact, customizable, cylindrical pressure electromechanical switch for OEMs



Advantages:

- Variety of options to customize design
- 1-1/4" diameter and height as small as 3"
- Most models designed to meet enclosure type 4 requirements
- Factory set or field adjustable with tamper-resistant cover
- Choice of 7 electrical terminations
- Ranges to 7,500 psi (517 bar)
- Proof pressures up to 12,000 psi (827 bar)

24 Series

Compact, economical differential pressure electromechanical switch for OEMs



Parts 24-011 Opening Station BAN Opening Station

Advantages:

- Compact, lightweight corrosion-resistant polyester enclosure
- Terminal block wiring
- Available with brass or polysulfone (FDA approved) pressure connections
- OEM capabilities include external adjustment knob with or without reference scale
- Ranges to 45 psid (3 bar d)

info@able.co.uk







Indicating temperature electromechanical switch for industrial heating and cooling applications

Advantages:

- Indicating temperature control with remote stainless steel bulb and capillary
- · Corrosion-resistant Lexan enclosure
- Single or dual SPDT switch outputs
- Set point repeatability and indication accuracy ± 1%
- Ranges to 650 °F (343 °C)





55 Series

Rugged temperature electromechanical switch with external dial

Advantages:

- Panel or surface mount for temperature alarm, emergency shutdown and control functions
- Enclosed or open-frame construction
- Single or dual SPDT switch outputs
- Dual switch output versions can be separated up to 100% of range
- Designed to meet enclosure type 4X requirements
- Heat tracing models
- Ranges to 650 °F (343 °C)



Thermocouples, RTD's, and Thermistors for Process & OEM markets

Advantages:

- Standard and made-to-order temperature sensors
- Maximum reliability and long-life thermocouples with a variety of protection tubes
- Heat tracing RTD's with replaceable RTD elements to minimize downtime
- NEMA 4 or explosion-proof heads
- Transmitt er heads with 4-20 mA output







The Sensor Box™

Emergency kit with a modular system of sensors, hardware and tools

Advantages:

- Build your own sensor assemblies on-site, within minutes
- Customized to fit your application needs
- Reduce downtime in emergencies
- Eliminate expediting fees
- Lower, more flexible inventory

12

Phone +44 (0)118 9311188 **Email**

info@able.co.uk

Web able coluk E-commerce









Quick Selection Guide for UE Products

														3E		C	ne Serie	s			7
PRODUCT SERIES	9ſ	10	12	121K	24	J40	54	55	100	117	120	400	800	820E/822E	1XSWLL	1XSWHL XSWHH	1XTXSW	1XTX00	ONE Safety (25LP)	Excela	
PAGE	11	9	6	11	9	11	10	10	8	6	7	8	12	7	5	5	5		5	8	4
VARIABLE																					
Pressure	•	•	•			•	•		•	•	•	•			•	•	•	•	•	•	Т
Vacuum	•		•	•		•	•		•	•	•	•			•	•	•	•	•	•	T
Differential Pressure			•	•	•				•	•	•	•			•	•	•	•	•	•	T
Temperature			•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	T
Gas																					-
ENCLOSURE																					
Open frame						•	•	•													Т
Enclosure Type 1 Gen. Purpose		•		•	•		•						•								T
Enclosure Type 4 Watertight		•											0	•							T
Enclosure Type 4X Watertight	•		•	0				•	•	•	•	•			•	•	•	•	•	•	
Zone 0, Intrinsically Safe	0	0	0	0					0	0	0	0			•						T
Division 1 Zone 1, Hazardous Location, IP 66 Rating			•								•			•	•	•	•	•	•		•
Division 2 Zone 2, Hazardous Location, IP 65 Rating			•							•	•			•	•	•	•	•			4
ОИТРИТ																					
Single Switch SPDT	•	•		•	•	•	•	•	•		•	•	•	•	SPST	SPST			SPST	•	Т
Dual Switch SPDT							•	•			•	•	•	•			2xSPST				
Triple Switch SPDT												•									
DPDT									0		0	0									T
Dual Switch DPDT												0									T
Adjustable Deadband	0			0		0	0		0		0	0			•	•	•		•	•	T
Hermetically-Sealed Switch SPDT			•							•	0										T
Hermetically-Sealed Switch DPDT			•							0	0										T
4 to 20 mA, HART																	•	•			
Wireless HART WirelessHART																					
SENSORS																					
Welded Stainless Steel Diaphragm			•							•	•	•			•	•	•	•	•	•	Т
Stainless Steel Bellows	•			•			•		•	•	•	•									T
Elastomer Diaphragm		•	•		•		•		•	•	•	•									+
Brass/Bronze Bellows	•			•		•	•		•	•	•	•									$^{+}$
Piston	•	•	•				•		•		•	•									+
Process Alloy		Ť	0						0	0	0										t
Local Temperature Mount			•				•		•	•	•				•	•	•	•	•	•	$^{+}$
Remote Temp. Mount			•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	+
Toxic (H ₂ S, CO, NH ₃)							_			_	_	<u> </u>	-						<u> </u>	Ť	
Combusti ble (CH ₄ , C ₃ H ₈ , LEL%)																					
MISCELLANEOUS																					
Terminal Block					•					•	•		0	•	•	•	•	•		•	T
Visual Indication*					0			0	0	_	0	0	•	•	•	•	•	•	•	•	
Dual Seal Certified			•								<u> </u>				0	0	0	0	0		+
SIL 2 Certified			0						0		0				•	•					+
	1	1		1		I	I	1		1	\cup		1		_				_	1	1

^{*}Visual indication may be through a pilot light option or display of process pressure or temperature readings.

● Available ○ Option





Certification Guide* for UE Products

CERTS / APPROVALS											117				2E		One Serie	es		Vangu	
		J6	10	12	J21K	24	140	54	55	100		120	400	800	820/822E	1XSWLL	1XSWHL XSWHH 1XTXSW & 1XTX00	ONE Safety (2SLP)	Excela	TCD50	TCD60
NORTH AMERICA																					
FM	FM												•								
_	UL Mark	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
c (UL) us	CL I, Grp A			•												•	•				
	CL I, Grp B														•		•	•			
ر آل انه	Intertek Ex db ia [ia] IIB T4 Gb IP66																			•	
Intertek	Intertek Ex db ia [ia] IIC																				•
TSSA TSSA	CRN	•	•	•	•	•	•	•		•	•	•	•			•	•	•			
Enclosure Rating			Type 4	4X						4X	4X	4X				4X	4X	4X	4X	4X	4X
EUROPE																					
	ATEX Ex ia	•	•	•	•						•		•			•				•	•
(Ex)(E)	ATEX Ex nA															•	•				
CX/C	ATEX Ex db			•								•			•	•	•	•		•	•
	ATEX Ex tb			•								•			•	•	•	•			
Electromagnetic Compatibility (EMC)	2014/30/EU															•	•	•			
Low Voltage Directive (LVD)	2014/35/EU	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•
Pressure Equipment Directive (PED)	2014/68/EU	•	•	•	•	•	•	•		•	•	•	•		•	•	•	•			
Enclosure Rating				IP66								IP66			IP66	IP66	IP66	IP66	IP66	IP66	IP66
INTERNATIONAL		,																			
	IEC Ex ia	•	•	•	•					•	•	•	•			•				•	•
IFC TECEX	IEC Ex nA															•	•				
	IEC Ex db			•								•			•	•	•	•		•	•
	IEC Ex tb			•								•			•	•		•			
Enclosure Rating				IP66								IP66			IP66	IP66	IP66	IP66	IP66	IP66	IP66
SIL																					
CAPATI P	SIL			•						•		•				•		•			

Ex d = Flame-Proof Ex tb = Dust Protected Ex ia = Intrinsic Safety Ex nA = Non-Arcing Ex tb = Dust Protected CL 1, Groups A - Class 1, Groups A, B, C, D; Class II, Groups E, F, G: Class III
CL I, Groups B = Class 1, Groups B,C,D; Class II, Groups E, F, G; Class III
Available Option

UE is a registered trademark of United Electric Controls Company. Excela, Vanguard and The Sensor Box are trademarks of United Electric Controls Company.

The following registered trademarks are property of the respective companies: Lexan General Electric Co.

HART and WirelessHart FieldComm Group









Certification Guide* for UE Products

	/ APPROVALS														2E		One Serie	es .	m.	ard
CERTS / APPROVALS		9Г	10	12	JZ1K	24)40	54	55	100	117	120	400	800	820/822E	1XSWLL	1XSWHL XSWHH 1XTXSW & 1XTX00	ONE Safety (2SLP)	Excela	Vanguard
BRAZIL																				
	INMETRO Ex ia			0						0	0	0	0			0				
T (U)	INMETRO Ex nA															0				
INMETRO OCEANO	INMETRO Ex db			0								0			0	0	0	0		
THILE THE OUT OF THE PERSON OF	INMETRO Ex tb			0								0			0	0	0	0		
CHINA																				
	CCC / Ex ia	0	0	0	0					0	0	0	0			0				
(m)	CCC / Ex ec															0	0			
(m)	CCC / Ex db			0								0		0		0	0	0		
	CCC / Ex tb			0								0		0		0	0	0		
INDIA																				
	PESO Ex d			Δ								Δ			Δ	Δ	Δ	Δ		•
	PESO Ex ia	Δ	Δ	Δ	Δ					Δ	Δ	Δ	Δ			Δ				•
KOREA																				
5 0	KOSHA/KGS Ex d			0								0			0	0	0			0
€s	KOSHA/KGS Ex tb											0								
€ s	KOSHA/KGS Ex ia															0				0
RUSSIA, KAZAK	HSTAN, BELARUS, A	ARME	NIA,	KYR	GYZ:	STAN														
	EAC Ex db			•								•			•	•	•	•		•
EH[Ex	EAC Ex tb			•								•			•	•	•	•		
LIILEX	EAC Ex ia	•	•	•	•					•	•	•	•			•				
TAIWAN																				
(7)	ITRI											•				•	•			
UKRAINE																				
	UkrEx			•								•			•					
UNITED ARABE	MIRATES (UAE)																			
	ECAS / Ex ia	Δ	Δ	Δ	Δ					Δ	Δ	Δ	Δ			Δ				
	ECAS / Ex db			Δ								Δ		Δ		Δ	Δ	Δ		
	ECAS / Ex tD			Δ								Δ		Δ		Δ	Δ	Δ		
NB-0001	ECAS / Ex nA															Δ	Δ			
Ford Floor Brook		-	-														- 4 11 11			

 $\mathsf{Ex}\,\mathsf{d} = \mathsf{Flame}\text{-}\mathsf{Proof}$ Ex tb = Dust Protected Ex ia = Intrinsic Safety

 $\mathsf{Ex}\ \mathsf{nA} = \mathsf{Non}\text{-}\mathsf{Arcing}$ Ex tb = Dust Protected

CL 1, Groups A - Class 1, Groups A, B, C, D; Class II, Groups E, F, G: Class III

CL I, Groups B = Class 1, Groups B,C,D; Class II, Groups E, F, G; CLass III

● Available ○ Option △ Contact ABLE





