

FM Approvals
1151 Boston Providence Turnpike
P.O. Box 9102 Norwood, MA 02062 USA
T: **781 762 4300** F: 781-762-9375 www.fmapprovals.com

CERTIFICATE OF COMPLIANCE

HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT

This certificate is issued for the following equipment:

BR385 Sounder

IS / I / 1 / ABCD / T4 Ta = 60° C - Entity - Cl385-32; IP66 I / 0 / AEx ia IIC T4 Ta = 60° C - Entity - Cl385-32; IP66 Entity parameters: Terminals "+" and "-" $U_i = 28 \ V, \ I_i = 93 \ mA, \ P_i = 660 \ mW, \ C_i = 0, \ L_i = 0$ Terminals S2 and S3 to "-" $U_i = 28 \ V, \ I_i = 0, \ C_i = 0$ $U_o = 16.8 \ V, \ I_o = 7.23 \ mA, \ P_o = 31 \ mW$

Special Conditions of Use

1. To avoid a possible electrostatic charge only clean with a damp cloth

Equipment Ratings:

Intrinsically safe, with entity parameters, for use in Class I, Division 1, Groups A, B, C, D and Class I, Zone 0, Group IIC, in accordance with Control Drawing No. Cl385-32, Hazardous (Classified) Locations indoor/outdoor (IP66).

FM Approved for:

BEKA Associates Ltd Hitchin, Hertfordshire United Kingdom



This certifies that the equipment described has been found to comply with the following Approval Standards and other documents:

Class 3600 Class 3610	2011 2010
Class 3810	2005
IEC 60529	1989

Original Project ID: 0003027157 Approval Granted: June 19, 2006

Subsequent Revision Reports / Date Approval Amended

Report Number Date Report Number Date

3054106 November 24, 2014

FM Approvals LLC

J⁄E. Marquedant

Manager of Electrical Systems

24 November 2014

Date

27

The Shunt Zener Diode Barrier must be a FM approved, resistively Appd. 3. The associated apparatus manufacturer's installation drawing must cable glands, or conduit hubs, shall be fitted that provide the required 5. The resistance between the intrinsically safe ground and the earth limited, single channel barrier having parameters less than, or equal to, those quoted, and for which the output is non-ignition capable for the Class, Division or Zone and Group of use. 7. The BR385 Sounder enclosure has an ingress protection rating of IP 66. If supplied without cable entry devices then metallic or plastic CAUTION - The clearance between sounder terminals S2 and S3 is 10. The total capacitance connected to terminals +/- of the sounder, i.e. Cashe plus any other capacitance, shall not exceed 83nF. "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code (ANSINFPA 70). CAUTION - Bonding between conduit connections is not automatic 4. Installation should be in accordance with ANSI/ISA RP12.06.01 8. To prevent ignition of flammable or combustible atmospheres, Ckď. No revision to drawing without prior FM approval. The associated apparatus must be FM approved. Substitution of components may impair safety. and must be provided as part of this installation. be followed when installing this equipment. disconnect power before servicing. ground must be less the 1 ohm. environmental protection. Modification less than 6mm. Date Notes: Zener Diode Barriers/ Diode Return Barriers 33 company confidential, copyright reserved. associates England Associated Apparatus - Diode Return Barrier Associated Apparatus - Diode Return Barrier Associated Apparatus - Shunt Zener Diode Jnclassified Location Barrier with Entity Parameters: lo ≤ 93mA Po ≤ 660mW Co ≥ Ccable (see note 10) Lo ≥ Lcable with Entity Parameters: with Entity Parameters; 3月7月 Hitchin U_o ≤ 28V I_o = 0 Co ≥ Ccable Co ≥ Ccable U_o ≤ 28V U_o ≤ 28V 0 = o Shunt Appd. Çkd. S3 **S2** Class I, Division 1, Groups A, B, C, D Class I, Zone 0, Groups IIA, IIB, IIC ı + S Class I, Zone 0, AEx ia IIC T4 Hazardous (Classified) Location Terminals S2 & S3 w.r.t.-(-40°C ≤ Ta ≤ + 60°C) Entity Parameters: Terminals + w.r.t. BR385 Sounder lo = 7.3mAPo = 31mW $P_i = 660 \text{mW}$ $U_0 = 16.8V$ Ii = 93mA $U_1 = 28V$ $U_i = 28V$ Ci = 0 C; = 0 L; = 0 li = 0 Modification First issue Scale Checked Drawn 02.05 Title Date 1:1 RC SOUNDER Control Drawing **BR385** Drawing No. CI385-32 88 Sheet 1 of 2

Controlled

	Т	Т				+		<u></u>				oj.				t 🐷			
Appd.						snu bu	6.01 sified)	ess thar tion	ating of plastic equired	e Š		nder, i.	ally is than,			omatic	33 ES Dr		
Ckd.						ı drawir	RP12.0 s (Class PA 70).	oved, eters le on-ignii se.	ction ra allic or l	ospher		he sou ìF.	alvanic I be les	2		not aut	s S2 ar		
				vaľ.	/ed.	allation	ardous SI/NFF	M appr paramout is no out is no up of us	s prote en meta t provic	ole atmo	٠	+/- of t	g the g 3/- shall	s +/		ons is 1	rminals		
				appro	approv	ւ's inst t.	th ANS for Haz de (AN	be a Fl naving ne outp nd Grou	ingress ces the ed that	nbustib	safety	minals ot exce	inecting and S3	eminal		onnection allation	nder te		
				rior FM	be FM	facture	ince wi stems ical Co	y must supply I which tl	has an ry devi II be fitt	. or cor	' impair	d to ten shall n	les cor ls S2/-	under to		nduit co	nos ue		
	thout pr				s manu this eq	accorda Safe Sy I Electri	Supply annel s nd for v	losure tuble ent	nmable	ıts may	nnecte itance,	the cab ermina	y to sou		en cor art of tl	betwe			
tion				wing wi	paratu	paratu	be in a ically S lational	solated ngle ch oted, a s, Divisi	fer enchout ca duit hul	n of flar fore se	nponer	nce col	cable of a	lddns		betwee	arance		
Modification				to dra	ated ap	ated ap	should f Intrins id the N	ited, sii lose qu e Clase	Sound lied wit or con	ignitior wer be	n of cor	apacita Iy other	s to so	solated		Sonding provide	The cle m.		
Date	1			 No revision to drawing without prior FM approval. 	The associated apparatus must be FM approved.	The associated apparatus manufacturer's installation drawing must be followed when installing this equipment.	4. Installation should be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code (ANSI/INFPA 70).	The Galvanically Isolated Supply must be a FM approved, resistively limited, single channel supply having parameters less than, or equal to, those quoted, and for which the output is non-ignition capable for the Class, Division or Zone and Group of use.	6. The BR385 Sounder enclosure has an ingress protection rating of IP 66. If supplied without cable entry devices then metallic or plastic cable glands, or conduit hubs, shall be fitted that provide the required environmental protection.	 To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing. 	8. Substitution of components may impair safety.	9. The total capacitance connected to terminals $\pm l$ - of the sounder, i.e. C_{cabb} plus any other capacitance, shall not exceed 83nF.	10. The Ccabe and Leabe of the cables connecting the galvanically isolated relays to sounder terminals S2/- and S3/- shall be less than, or equal to, the Crabe and Leabe of the cable connecting the	galvanically isolated supply to sounder terminals +/	;;l	CAUTION - Bonding between conduit connections is not automatic and must be provided as part of this installation.	CAUTION - The clearance between sounder terminals S2 and S3 is less than 6mm.		
lss.		\vdash	tion	4. No	2. Th	3. Th be fo	4. Installation	5. Th resis or eq capa	6. Th IP 66 cable envir	7. To disco	8. S	9. Tr Ccabi	10. T isola or ec	galva	Notes:	CAU	CAU		
٣			stalla																
	9	ed.	Z Z]			1	7 [
1		company confidential, copyright reserved.	Rela				ited			pated					ated				
	Focial England Pyright resilated Re						lly fsola			lly Isola					lly Isok				
	copy copy						Ivanical ers:			Vanica			Vanica rs:						
	Chin Er confidential, copy upply / Isolation Unclassified Location				us - Gal aramete			us - Ga ramete			Associated Apparatus - Galvanically Isolated Relay with Entity Parameters: Uo = 0 Io = 0 (See Note 10)								
1	Hitchin England any confidential, copyright reserved. Supply / Isolated Relay Is				Associated Apparatus - Galvanically Isolated Supply with Entity Parameters: Uo ≤ 28V Io ≤ 93mA Po ≤ 660mW Co ≥ Ccable (see note 9) Lo ≥ Lcable			Associated Apparatus - Galvanically Isolated Relay with Entity Parameters: Uo = 0 Io = 0			pparati								
		pany	S pa				ated A	28V 3mA 360mW Ccable (s		iated A	with Er)			:	iated A with Er	Uo = 0 Io = 0 (See Note 10)			
O	٥	СОП	solat				Associa Supply	U o ≤ 28V lo ≤ 93mA P o ≤ 660mV Co ≥ Ccable Lo ≥ Lcable		Assoc	Relay w Uo = 0) ! !			Assoc Relay	Uo = 0 Io = 0 (See M			
		1	<u>₹</u>										<u> </u> 		Τ.				
Appd.			Galvanically Isolated Supply / Isolated Relay Installation		_			-		1					+	-)		
Ckd.			Galve							1							٦		
H				ition	B, S, D		4 + 1					S2			S33				
			Hazardous (Classified) Location Class I, Division 1, Groups A, B, C, D Class I, Zone 0, Groups IIA, IIB, IIC BR385 Sounder IS Class I, Zone 0, AEx ia IIC 74 (40°C ≤ Ta ≤ + 60°C) Hantity Parameters: Terminals + w.r.t Ui = 28W Ii = 93mA Pi = 660mW Ci = 0 Li = 0 Li = 0 Ci = 0 Ci = 0 Ci = 0 Ci = 0 Uo = 76.8W Io = 7.3mA Po = 31mW																
		Hazardous (Classified) Louss I, Division 1, Groups IIA lass I, Division 1, Groups IIA BR385 Sounder IS Class I, Zone 0, AEx is (40°C ≤ Ta ≤ + 60°C) Entity Parameters: Terminals + w.r.t Ui = 28V Li = 0 Li = 0 Ci = 0 Uo = 16.8V Io = 16.8V Io = 7.3mA Po = 31mW																	
			Hazardous (Classif ass I, Division 1, Grass I, Division 1, Grass I, Zone 0, Grounder IS Class I, Zone 0, (40°C ≤ Ta ≤ + 60 (40°C ≤ Ta ≤ + 60 (40°C ≤ Ta ≤ + 60 Li = 93mA Pi = 660mW Ci = 0 Li = 0 Li = 0 Ci =																
tion	issue			Hazardous (Gass I, Division lass I, Division lass I, Zone (Gass I, Zone (Gass I, Zone (Gass I, Zone (Gass I, Zone I) = 28V Ii = 93mA Pi = 660mW Gi = 0 Li = 0 Ci =															
Modification	First iss			Co	Ö														
	02.05 2006 Fil		Title			, in the second						Dro		Ch	necke	ed	Scale		
				BR3	85	S	OUNDE	R Cont	rol Dra	wing		Dro	RC wing No).		385	1:1 5-32		
lss.	_						· · · · · · · · · · · · · · · · · · ·					She	et 2 o	f 2	<u> </u>	<u> </u>	, – 52		