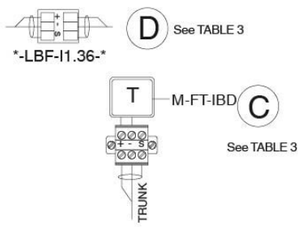
1. INTRINSICALLY SAFE DART CIRCUIT:
THE DASHED LINES ENVELOPE THE DART CIRCUIT. ONLY MATCHED DART CERTIFIED COMPONENTS ARE PERMITTED FOR CONNECTION TO THIS CIRCUIT. FOR PERMITTED DART COMPONENTS, SEE TABLE 3 AND NOTE 7.
STANDARDS: IEC 60079-14 AND IEC 60079-25 APPLY.

2. INTRINSICALLY SAFE CABLE SHIELD/SCREEN EARTH TO IEC 60079-14 AND 25.
THIS MUST BE CONNECTED TO A CLEAN EQUIPOTENTIAL BONDING SYSTEM TO EARTH.
ALL IS and NON-IS SHIELDS/SCREENS MUST BE CONNECTED TO THE SCREEN (S)TERMINALS OR SOCKET/PLUG PINS.

3. INSTALLATION POSITION OPTIONS FOR SURGE PROTECTOR PART No. *-LBF-I1.36-*
WARNING: A MAXIMUM OF 5 SURGE PROTECTORS CAN BE CONNECTED TO EACH TRUNK AND 2 SURGE PROTECTORS CAN BE CONNECTED TO EACH SPUR. SEE TABLE 2.



4. A MAXIMUM OF FOUR R3-SP-IBD* SEGMENT PROTECTORS CAN BE CONNECTED.
SEE TABLE 1 FOR TRUNK LENGTH & CABLE SPECIFICATION.
TEMINATOR M-FT-IBD MUST BE FITTED TO THE FINAL SEGMENT PROTECTOR AS ILLUSTRATED RIGHT.
WARNING:
USE ONLY DART APPROVED TERMINATORS PART No. M-FT-IBD.
A MAXIMUM OF ONE TERMINATOR MAY BE INSTALLED IN THE FIELD.

5. DEVICE ENTITY PARAMETERS:
SEE TABLE 2
ALL DEVICES REMAIN PASSIVE; NON FEEDING I < 50µA

6. TO BE MOUNTED IN A SUITABLE ENCLOSURE, WHICH IS CERTIFIED FOR THE PROVIDED USE.

7. AUXILIARY TEST EQUIPMENT (HAND HELD) CONNECTION:
AUXILIARY TEST EQUIPMENT MAY BE CONNECTED TO THE TRUNK, SPUR OR HOST CONNECTION UNDER THE FOLLOWING CONDITIONS:
AUXILIARY TEST EQUIPMENT MUST BE NON-FEEDING, PASSIVE AND CERTIFIED INTRINSICALLY SAFE FOR USE IN ZONE 1 OR ZONE 2.
GAS CLEARANCE (WORKING PERMIT) MUST BE GIVEN WHEN USING NON-DART COMPONENTS ON THE TRUNK.
AUXILIARY TEST EQUIPMENT MAY BE CONNECTED TO THE SPUR OR HOST CIRCUIT WITHOUT GAS CLEARANCE OR WORKING PERMIT.
WHERE THE DART POWER HUB IS INSTALLED IN THE SAFE AREA, HOST CONNECTED AUXILIARY TEST EQUIPMENT MAY NOT NEED TO BE CERTIFIED.
THEY MAY BE FEEDING AND ACTIVE, PROVIDED THAT THEY ARE LIMITED TO AN OUTPUT OF 35 V.

TABLE 1 - TRUNK CABLE AND DEVICES [Ex ib IIC, IIB]

Cable Cross Sectional Area	>= 0.823 mm² or 18 AWG	>= 1.309 mm² or 16 AWG	>= 2.081 mm² or 14 AWG
No. of Segment Protectors	MAXIMUM TRUNK CABLE LENGTH		
1	1000 m	1000 m	1000 m
2	800 m	1000 m	1000 m
3	700 m	1000 m	1000 m
4	600 m	900 m	1000 m
CABLE IMPEDANCE	100 Ohms +/-20%		
NUMBER OF SURGE PROTECTORS	5 MAXIMUM PER TRUNK - SEE TABLE 3		
NUMBER OF DEVICE COUPLERS	A MAXIMUM OF 4 (FOUR) SEGMENT PROTECTORS ONLY - SEE TABLE 3 & NOTE 4		
AUXILIARY TEST EQUIPMENT:	MAX 1 - SEE NOTE 7, Ui ≥ 24 V, Ii ≥ 413 mA		

TABLE 2 - SPUR CABLE & DEVICES [Ex ib] FOR GAS GROUP IIC (IIB in brackets)

	SIMPLIFIED ENTITY MODEL			STANDARD ENTITY MODEL
1 PARAMETER	2 DEVICE PARAMETERS	3 SURGE PROTECTOR PARAMETERS	4 NON-FEEDING AUX TEST EQUIPMENT	5 TOTAL SPUR PARAMETERS (The summation of all components including the cable). See note below.
INPUT VOLTAGE Ui	≥ 23 V	≥ 23 V	≥ 23 V	≥ 23 V
INPUT CURRENT Ii	≥ 47 mA	≥ 47 mA	≥ 47 mA	≥ 47 mA
INPUT CAPACITANCE Ci	≤ 5 nF	≤ 5 nF	≤ 5 nF	IIC: ≤ 60 nF, IIB: ≤ 470 nF
INPUT INDUCTANCE Li	≤ 20 uH	≤ 20 uH	≤ 20 uH	IIC: ≤ 150 uH, IIB: ≤ 1 mH
INPUT POWER Pi	≥ 1.08 W	≥ 1.08 W	≥ 1.08 W	≥ 1.08 W
NUMBER OF DEVICES PER SPUR	1 MAXIMUM	2 MAXIMUM	1 MAXIMUM	See left, column 2,3 and 4
SPUR CABLE LENGTH	≤ 120 m			
CABLE IMPEDANCE	100 Ohms +/-20%			
AUX. TEST EQUIPMENT	MAX 1, SEE NOTE 7, SAFETY VALUES AS FOR DEVICES			

NOTE: The entity parameters can be established by meeting the individual parameters in column 2, 3 and 4. Alternatively, the entity parameters can be established by adding up each component's parameters to ensure that the total spur parameters in column 5 are met, which include the cable parameters Li and Ci.

NON INTRINSICALLY SAFE CIRCUITS MAXIMUM SAFETY INPUT VOLTAGE: Um = 35V PELV/SELV.

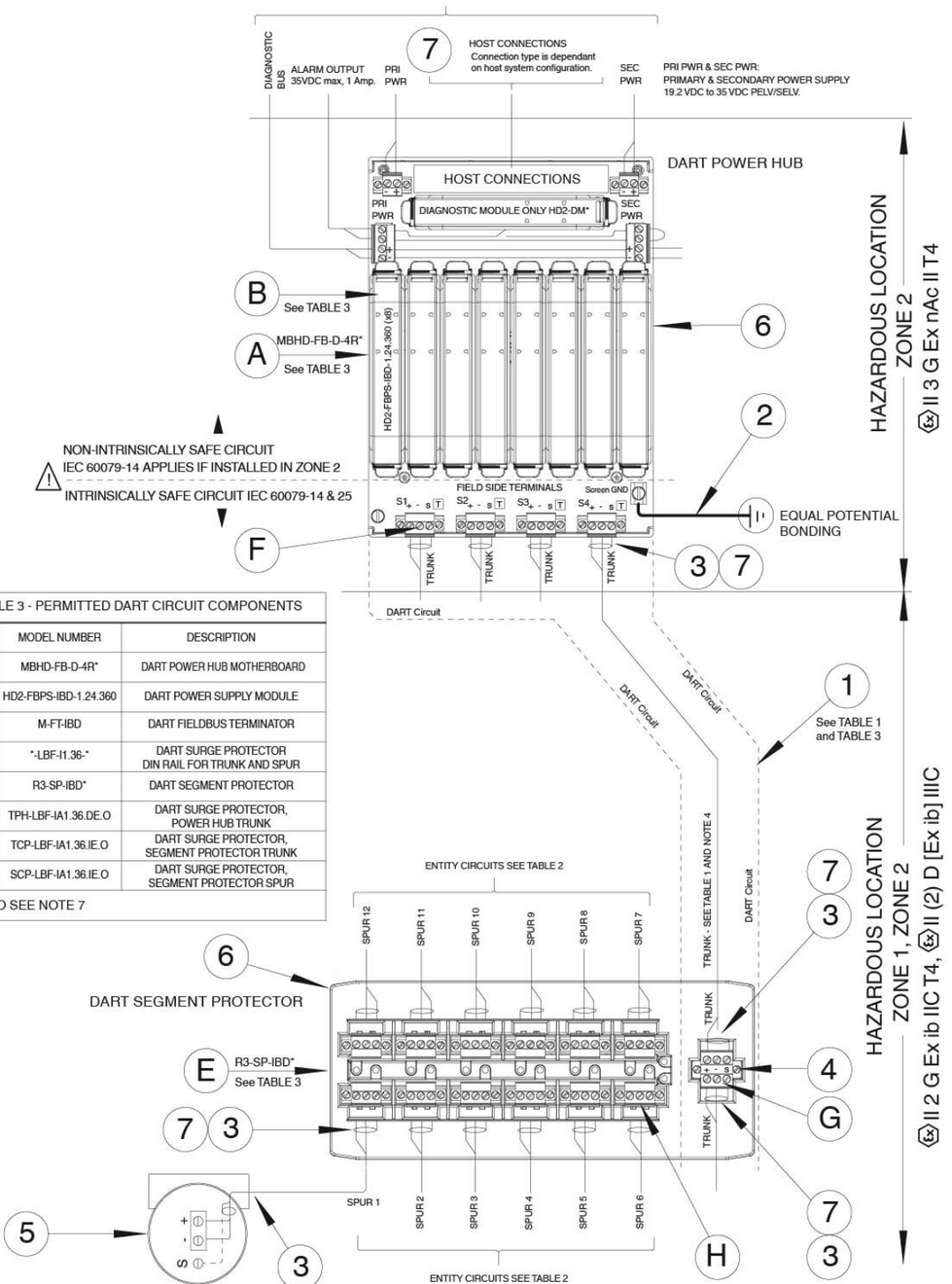


TABLE 3 - PERMITTED DART CIRCUIT COMPONENTS

No.	MODEL NUMBER	DESCRIPTION
A	MBHD-FB-D-4R*	DART POWER HUB MOTHERBOARD
B	HD2-FBPS-IBD-1.24.360	DART POWER SUPPLY MODULE
C	M-FT-IBD	DART FIELDBUS TERMINATOR
D	*-LBF-I1.36-*	DART SURGE PROTECTOR DIN RAIL FOR TRUNK AND SPUR
E	R3-SP-IBD*	DART SEGMENT PROTECTOR
F	TPH-LBF-IA1.36.DE.O	DART SURGE PROTECTOR, POWER HUB TRUNK
G	TCP-LBF-IA1.36.IE.O	DART SURGE PROTECTOR, SEGMENT PROTECTOR TRUNK
H	SCP-LBF-IA1.36.IE.O	DART SURGE PROTECTOR, SEGMENT PROTECTOR SPUR
ALSO SEE NOTE 7		

FOR FURTHER INFORMATION, PLEASE REFER TO THE DART SYSTEM MANUAL ON WWW.PEPPERL-FUCHS.COM

CONFIDENTIAL acc. to ISO 16016			date:2011-Nov-28
PEPPERL+FUCHS	{Installation Drawing}	respons.	116-0366
		approved	
Mannheim	DART-Fieldbus Power Hub System	norm	sheet 1 of 1