SIS-TECH Applications

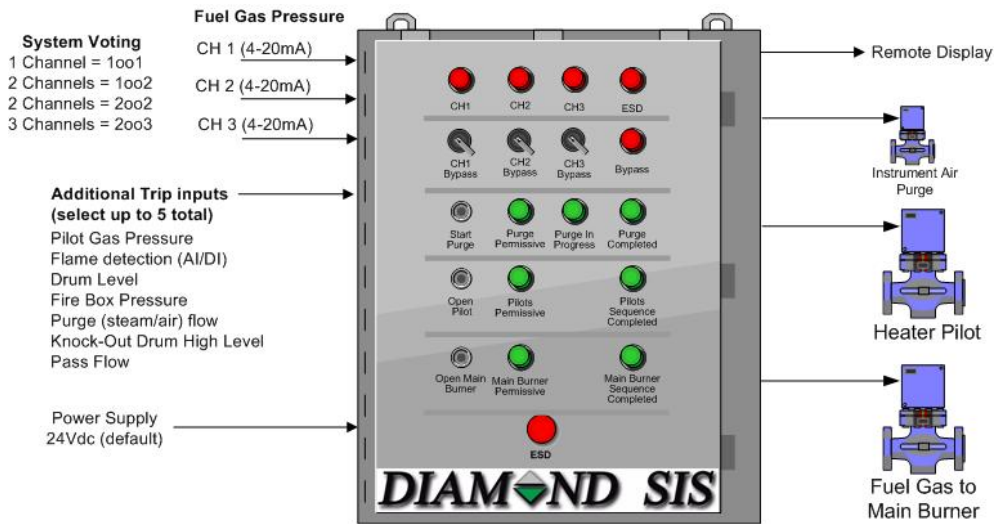
Burner Management Systems (BMS)

Boilers, heaters, and furnaces are considered critical equipment in most operating facilities, posing challenges to safe and reliable operation. Safety issues are generally related to burner light-off, loss of pass flow containment, and loss of flame. Even when safety is not a major concern, equipment criticality or replacement cost generally results in specification of protective functions to prevent equipment damage and downtime. The equipment reliability is also a high priority, making the avoidance of spurious trips a crucial design parameter.

The draft technical report *ISA-TR84.00.05 Application of ANSI/ISA 84.00.01-2004 for Safety Instrumented Functions (SIFs) in Burner Management Systems (BMS)* provides guidance on assessing which BMS protective functions should be implemented according to ANSI/ISA 84.00.01-2004 (IEC 61511). An analysis of the BMS logic solver often identifies deficiencies in its integrity and/or reliability, resulting in the need to upgrade it to achieve the required PFDavg and spurious trip rate.

The DIAMOND-SIS® is designed as a low-cost, stand-alone, non-PE logic solver. Rated for –30C to +75C and constructed using Class I Div II components the DIAMOND-SIS® can be installed in the harshest process units near the equipment under control. Field installation of the logic solver reduces implementation costs by 50% compared to safety-PLCs. DIAMOND-SIS® provides the end user with a fault tolerant and on-line testable logic solver that is functionally independent from the burner control system.

DIAMOND-SIS® receives up to three analog inputs per process variable and has two field adjustable trip points. This allows the process to be shutdown on high and/or low process variables. Further, the number of inputs and voting architecture, 1oo1, 1oo2, 2oo2 or 2oo3, can be adjusted per process variable to meet any SIL and spurious trip rate requirement. For greater flexibility, the DIAMOND-SIS® is modularized to fit your specific application. The unit may be specified to execute any BMS function, such as purge, light-off, fuel pressure, flame detection, pass flow, drum level, fire box pressure, and knock-out drum level.



THE LOW COST ALTERNATIVE TO SAFETY PLC's

DIAMOND SIS®

KEY FEATURES

2oo3 version is certified to IEC 61508 SIL 3 in SH3 configuration
High reliability
Proven technology
Rugged design
Field mountable
On-line testable & repairable
Remote process variable & system status monitoring
No programming
Low installed cost alternative to a Safety PLC

SPECIFICATIONS

Supply Power:	User specified, 24VDC/110VAC/240VAC
Input:	4-20 mA DC or discreet (dry contact)
Output:	5 Amp resistive dry contact
Accuracy:	1% of span
Temperature:	-40 to +80°C Storage / -35 to +75°C Operating
Environment:	All internal components rated Class I Div II Groups A/B/C/D
Enclosure:	NEMA 4X – choice of materials

ENGINEERING/DOCUMENTATION OPTIONS

Safety requirements specification for complete instrumented loop, including SIL Verification

ORDERING SELECTION

BM □-P □-S □-T □-SD □-R □-B □-C □-E □- ✱

(SH) Base System
1 Single Channel
2 Dual Channel
3 Triple Channel

(P) Power Supply
1 External 24 Vdc (default)
2 Simplex Power Supply 110/240VAC - 24 VDC
3 Dual Power Supply 110/240VAC - 24 VDC
4 UPS 110VAC - 24 VDC (30 min backup)
5 Simplex & UPS Combination

(S) Sequence
1 PURGE Permissive, in Progress, Completed & Failure.
2 PILOTS Permissive, sequence completed & Trip
3 MAIN. BURNER Permissive, sequence completed & Trip
4 2, 3 (Options)
5 1, 2, 3 (Options)

(T) Inputs Trips (1oo1)
1 One input Trip
2 Two input Trip
3 Three input Trip
4 Four input Trip

✱ -NS Systems which include non-standard options.

(SD) Manual Shutdown
1 Door Mounted ESD (Local)
2 Remote ESD
3 Both (Local & Remote ESD)

(R) Reset
1 Local Reset
2 Remote

(B) Bypass
1 Local Bypass
2 Remote Bypass

(C) Communications
1 Modbus RS485-serial)
2 Repeated Signal Isolator (Discrete 4-20mA)
3 Ethernet (Modbus/TCPIP)
4 Repeated Signal Isolator (Discrete 4-20mA) for Hart Protocol

(E) Enclosures
1 NEMA 4X Fiberglass
2 NEMA 4X 304 Stainless
3 NEMA 4X 316 Stainless