



PROCESS AUTOMATION

HiD2000 INTRINSIC SAFETY ISOLATORS & SIGNAL REPEATERS



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For over 25 years, Elcon Instruments have been a world leader in Intrinsic Safety (I.S.) interface techniques for the process industry.



In 2001, Elcon Instruments joined the Pepperl+Fuchs Group of companies with a mission to provide our customers with a diverse range of specialised Intrinsic Safety and general purpose I/O Interface products.

Our joint product portfolio is now supported by our large international sales and technical support team, which is available to provide assistance for your process automation needs.

Company milestones include:

- In 1974, the design and certification of what is thought to be the world's first intrinsic safety galvanic isolator, a technique now widely used as the world's standard I.S. interface method.
- Late 1980's, Elcon pioneered a new plug-in I.S. interface concept, using multi-channel modules plugged onto a PCB termination board. The board incorporated multi-core cable connectors, customised to match the I/O cards of the world's major process control systems. This innovative concept provided major cabinet and cable cost savings.
- In the early 1990's, Elcon introduced the first integrated HART® interface solution, using a Multiplexer module which mounted directly on field wiring termination board for both I.S. and non I.S. signals. This permitted the use of PC based PAM (Plant Asset Management) software for field device set up, monitoring and maintenance, of all HART® field devices.

Today we are known as Pepperl+Fuchs Elcon, focusing on the development of I/O interface solutions for the emerging Fieldbus environment and other applications.

We look forward in assisting you with a solution to suit your process needs.

Supply Connections

Redundant 24Vdc reverse polarity protected and fault bus connectors both with LED indication.

LED Status Indicators

Module status and power-on indicators for monitoring module operation and highlighting loop wiring faults.

Tagging

Provided on the front of every module, terminal strip and termination board.

Fault Monitoring

Modules monitor field wiring faults and output a common alarm to assist in maintenance.

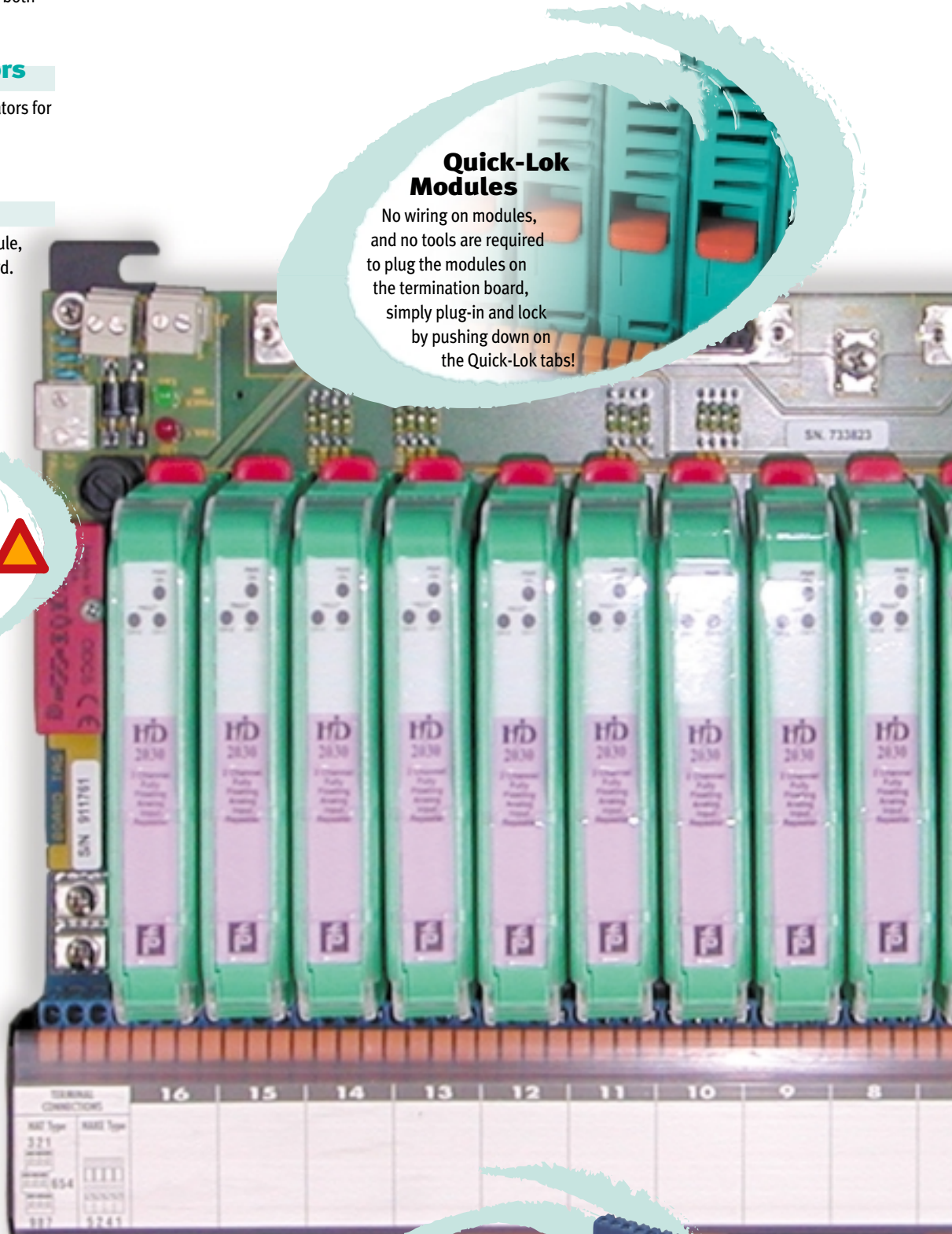


Quick-Lok Modules

No wiring on modules, and no tools are required to plug the modules on the termination board, simply plug-in and lock by pushing down on the Quick-Lok tabs!

Terminal Options

Use multi level terminal blocks (HAT) or choose the optional knife edge loop disconnect terminals with integral test jacks (HAKE).



System Connection

Choose either terminals, standard sub-D connectors, or a specific custom solution connector to plug direct to your DCS, PLC or ESD system I/O cards.

Module Keying

Using simple blocking pins you can configure each module position, so no mistake can occur during maintenance or commissioning.



Safety Approvals

Modules available for Safety System applications with assessment for use in SIL2 and SIL3 architectures.

Fixed Terminals

No loose terminals, allow you to terminate your field wiring direct to the termination board, therefore no wiring on modules.

High Density Modules

Up to 4 channel modules (DI) and 2 channels are available for all other signal types.



HART® Multiplexer

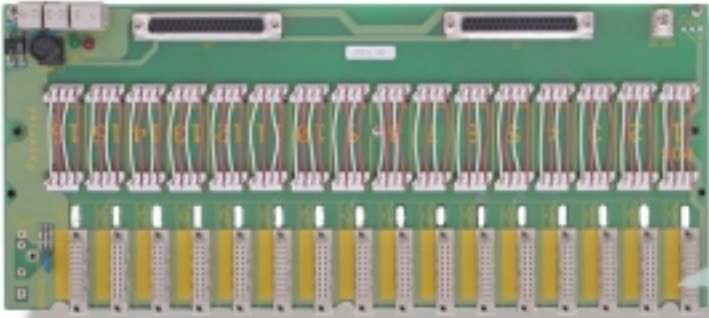
Simply plug-in the Mux2700 to access all your HART® field devices (see page 30).



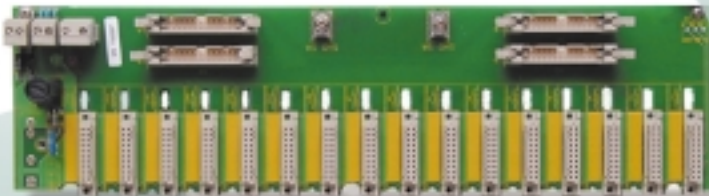
Just 2 Simple Steps!

1. Choose your connection method

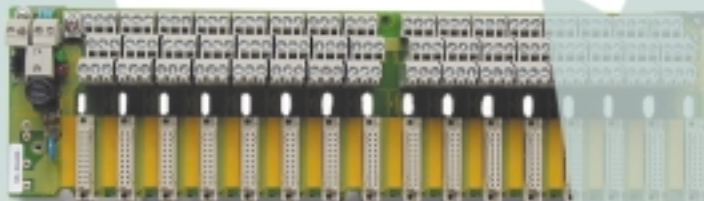
Simply select the safe area PCB (green) to match your preferred system connection. Choose from standard multi-level terminals (SAT), Universal Sub D connector (SACON) or match your DCS, ESD or PLC I/O cards by using a custom connector solution.



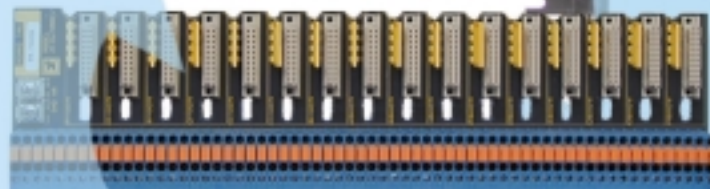
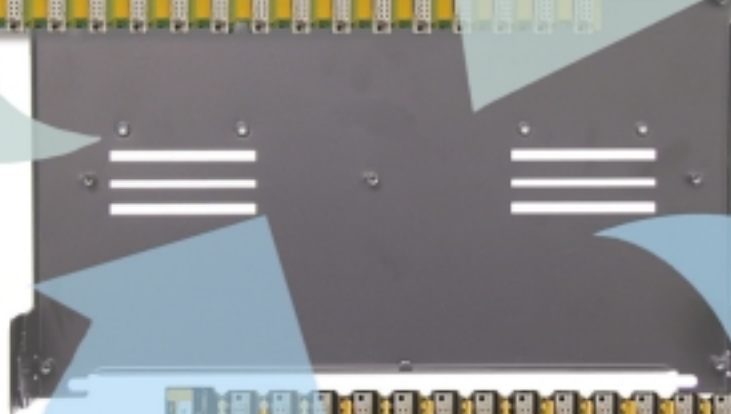
SACWCON



DCS SYSTEM



SAT



HAKE



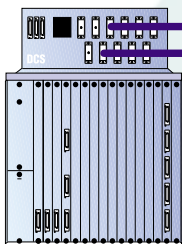
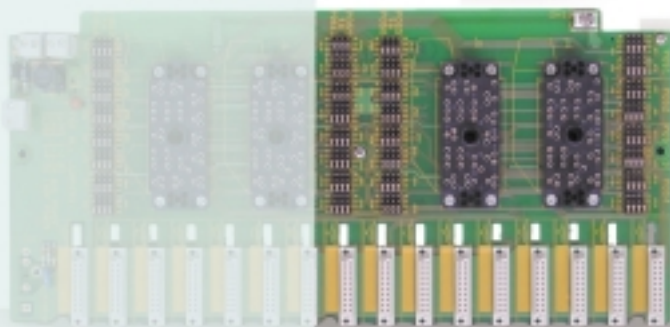
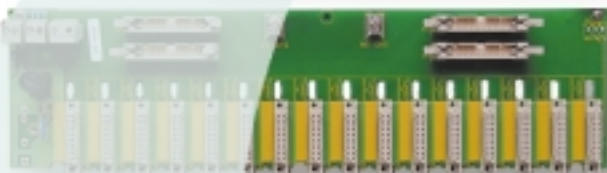
HAT

2. Choose field side terminals

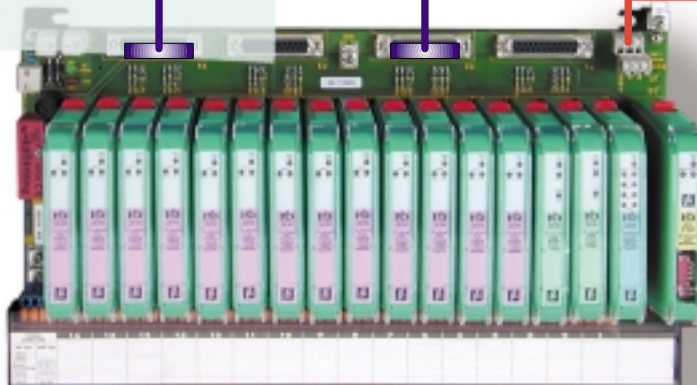
Add a HAT (multilevel) or HAKE (Knife Edge disconnects) terminal PCB (blue) for hazardous area applications.

Simply Choose a Solution

Direct Custom Interface Solutions are available for the most common DCS, PLC and ESD systems available on the market.



Control System I/O Card Racks



PAM Workstation

Can I replace my proprietary FTP?

Yes, it is now redundant, our HiD2000 emulates the standard FTP (Field Termination Panels) in every way. Just plug to our termination board using standard system cables.

Do you have a solution for my control system?

Yes!! Custom Solutions are available for all major DCS, ESD and PLC systems on the market today. If we do not have a solution for you, we will design one to your specifications.

Can I mix I.S. and non I.S. signals together?

Yes! Using our 2900TOP entry modules, you can mix I.S. and non I.S. signals on the same termination board while maintaining the necessary cable segregation.

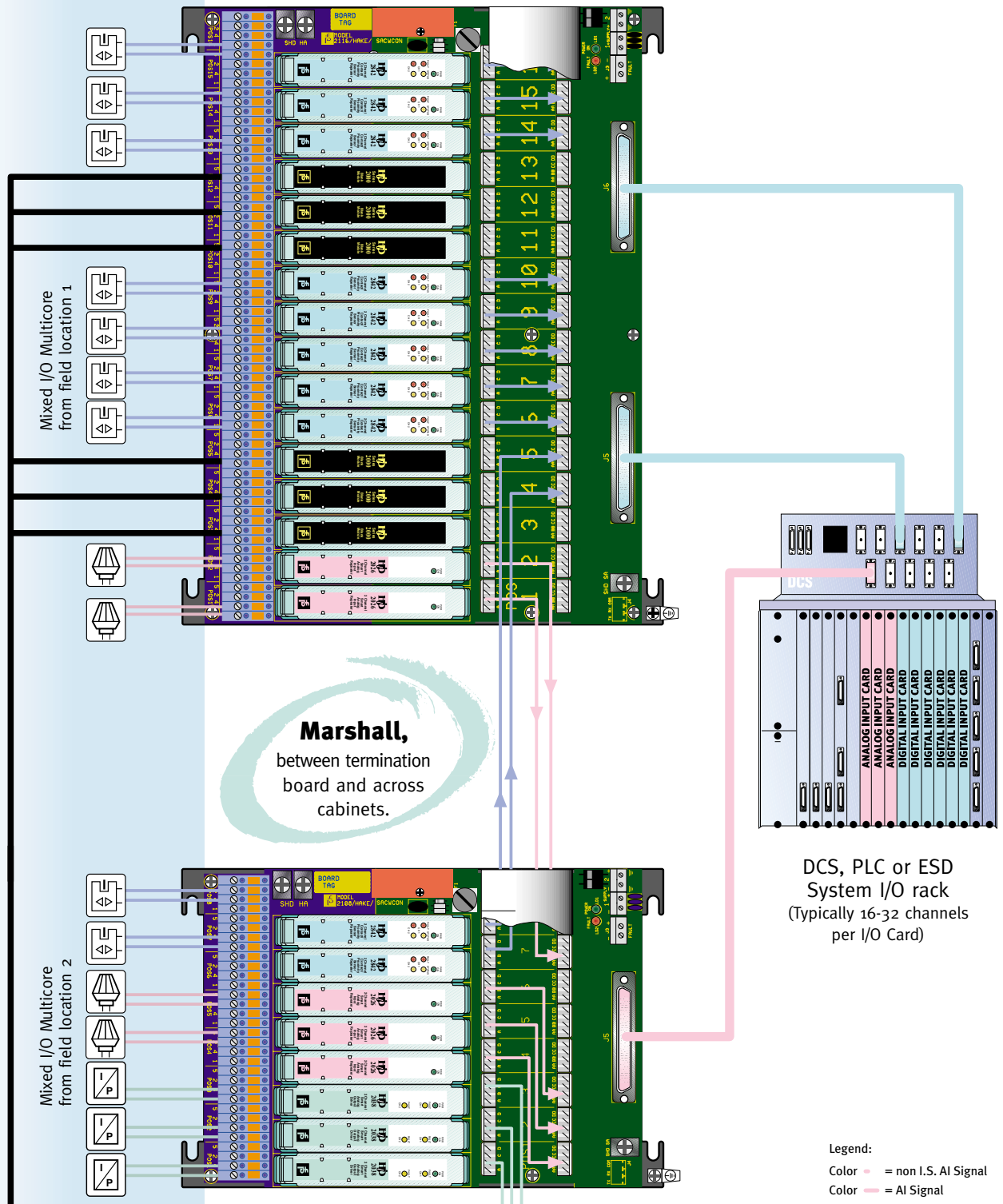
How can I connect my PAM software?

Simply plug on the Mux2700 HART® multiplexer to access all your HART® field devices.



SIGNAL MARSHALLING PHILOSOPHY USING CROSS-WIRING

HAZARDOUS AREA



DCS, PLC or ESD System I/O rack (Typically 16-32 channels per I/O Card)

- Legend:
- Color — = non I.S. AI Signal
 - Color — = AI Signal
 - Color — = DI Signal
 - Color — = AO Signal
 - Color — = Spare Cables

- Notes:
- 1) Only one wire per signal is drawn crossed wired to simplify the illustration.
 - 2) Cross-wiring is an option only, if not required the termination board width reduces in size.

Spare field cables?
Simply terminate to fixed terminals and add HiD2000 blank modules.

Cross-Wired,
to termination board with AO I/O card connector.

Marshall,
between termination board and across cabinets.

Hi-Integrity Power Supply

PS1550 modular redundant 24 Vdc supply for mission critical applications.

Integral Marshalling

Use Cross Wiring, to eliminate external marshalling cabinets!

Hi-Density,

Up to 1400 I/O channels are possible in a single back to back cabinet.

Complete Solution

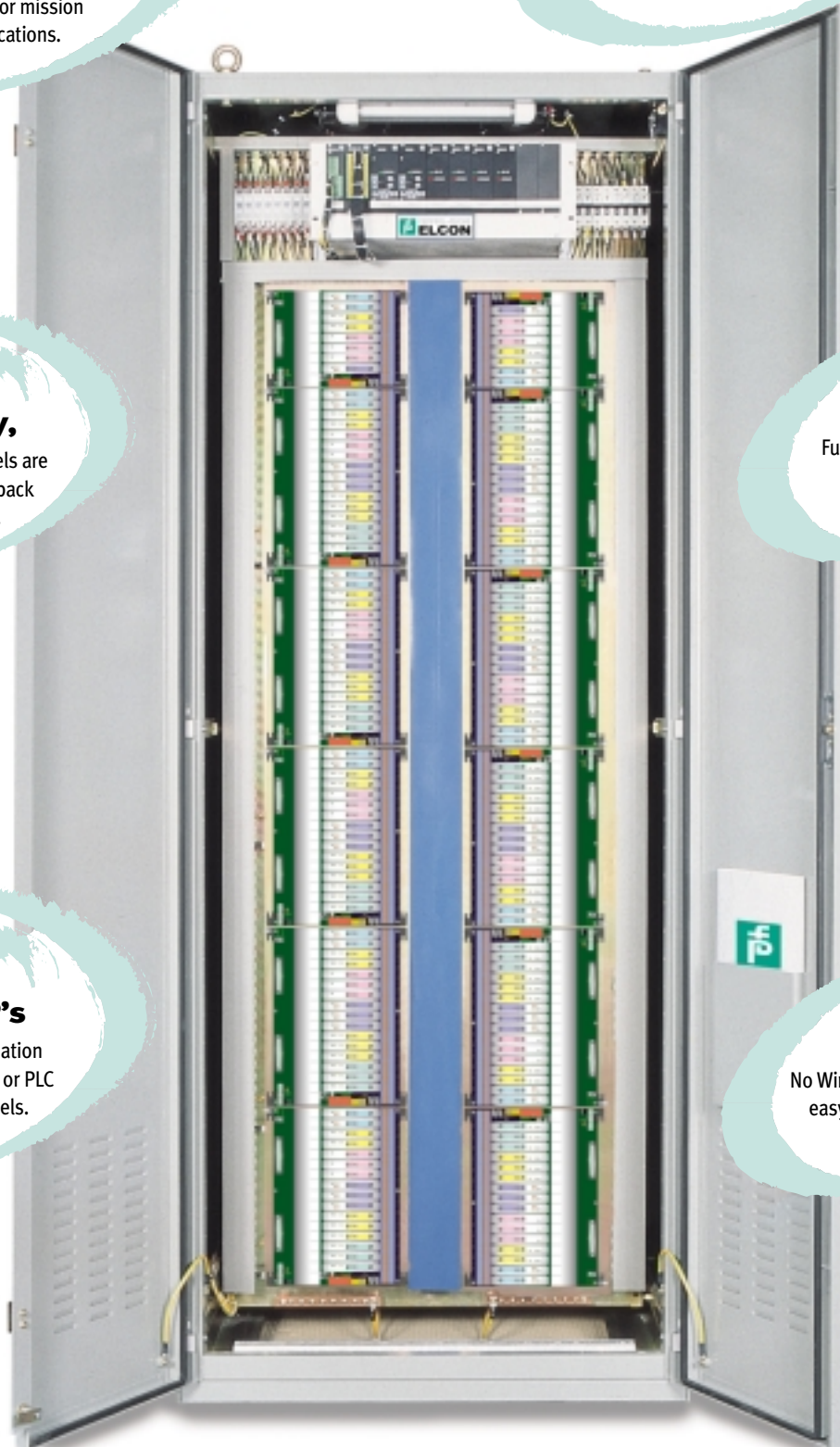
Fully engineered cabinets can be supplied to customer specifications.

Replace FTP's

HiD2000 custom termination boards replace DCS, ESD or PLC Field Termination Panels.




















Clean Installation

No Wiring on modules, for a clean easy to maintain installation.



Note:
Up to 1400 channels
+ PS1550 power
supply in a 2000 x
800 x 800 cabinet.

MODEL SELECTION

Field Device	Model	No. of Ch.	Hazardous Area Signal	Safe Area Signal	Fault Bus Output	Page
Analog IN  	HiD2012	2	4-20 mA input, Smart capable.	4-20 mA (or 1-5 V) sink or source output isolated from input, Smart compatible.		11
	HiD2025	1	4-20 mA (15.5 V) floating supply to Smart	4-20 mA (or 1-5 V) output isolated from input, Smart compatible.		12
	HiD2026	2	or non-Smart two wire Transmitters.			
	HiD2025SK	1	4-20 mA (15.5 V) floating supply to Smart	4-20 mA load sink, isolated from input, Smart compatible.		13
	HiD2026SK	2	or non-Smart two wire Transmitters.			
	HiD2029	1	4-20 mA (15.5 V) floating supply to Smart or non-Smart two or three wire Transmitters.	4-20 mA (or 1-5 V) output isolated from input and power supply, Smart compatible, Line Fault Detection.		14
HiD2030	2					
HiD2029SK	1	4-20 mA (15.5 V) floating supply to Smart or non-Smart two or three wire Transmitters.	4-20 mA load sink, isolated from input and power supply, Smart compatible, Line Fault Detection.		15	
HiD2030SK	2					
Analog OUT  	HiD2031	1	4-20 mA to I/P converters, valve actuators and displays.	Bus powered, 4-20 mA signal from DCS, PLC or other control devices.		16
	HiD2032	2				
	HiD2033	1	4-20 mA to I/P converters, valve actuators and displays.	Loop powered, 4-20 mA signal from DCS, PLC or other control devices.		17
	HiD2034	2				
	HiD2035	1	Fire, smoke detectors or I/P converters.	Loop powered 1,5 to 50 mA signal from control devices.		18
	HiD2036	2				
	HiD2037	1	4-20 mA and Smart signal to I/P converters, electrovalve actuators and displays.	Bus powered, 4-20 mA signal from DCS, PLC or other control devices, Line Fault Detection, smart compatible.		19
	HiD2038	2				
HiD2038Y	2		Recommended for use with Yokogawa DCS systems.			
Temperature IN  	HiD2061	1	Thermocouple or mV.	4-20 mA (or 1-5 V) output isolated from input.		20
	HiD2062	2				
	HiD2071	1	RTD or Potentiometer.	4-20 mA (or 1-5 V) output isolated from input.		21
	HiD2072	2				
	HiD2082	2	Thermocouple, mV, RTD or Potentiometer.	4-20 mA (or 1-5 V) sink or source output isolated from input.		22
Digital IN  	HiD2821	1	Dry Contact or Proximity Switch.	DPST relay for output and separate relay for LFD output.		
	HiD2822	2		DPST relay per channel, Line Fault Detection.		23
	HiD2824	4		SPST relay per channel, Line Fault Detection.		
	HiD2842	2	Dry Contact or Proximity Switch.	2 open-collector outputs per channel, Line Fault Detection.		24
	HiD2844	4		1 open-collector output per channel, Line Fault Detection.		
Digital OUT  	HiD2871	1	40 mA at 12 V to drive solenoid valve, audible or visual alarm (LED).	Bus powered, and/or loop powered, controlled by external contact from DCS or control device.		25
	HiD2872	2				
	HiD2873	1	40 mA at 12 V to drive solenoid valve, audible or visual alarm (LED).	Bus powered, controlled by external contact or logic level from DCS or control device, Line Fault Detection.		26
	HiD2874	2				
	HiD2875	1	40 mA at 11,2 V to drive solenoid valve, audible or visual alarm (LED).	Bus powered, and/or loop powered, controlled by external contact from DCS or control device.		27
	HiD2876	2				
	HiD2877	1	40 mA at 11,2 V to drive solenoid valve, audible or visual alarm (LED).	Bus powered, controlled by external contact or logic level, from DCS or control device, Line Fault Detection.		28
HiD2878	2					
HiD2881	1	60 mA at 13 V to drive solenoid valve, IIB Gas Group.	Bus powered and/or loop powered, controlled by external contact or logic level from DCS or control device, Line Fault Detection.		29	



2012

VOLT/MA CONVERTER

Application

Accepts a current or voltage input signal from Hazardous Area and converts it in a proportional, isolated current or voltage signal in Safe Area. Field programmable zero/span by means of trimmers and input/output configuration by means of dip switches allow simple field reconfiguration. Passive current input configuration supports a pass through for HART® smart communication signals. The outputs can be selected as current source, current sink or voltage by switches.

Specification

DC Supply

VOLTAGE: 20.4 V to 30 Vdc.

CURRENT CONSUMPTION: 25 mA at 24 V, (per channel).

POWER DISSIPATION: 1 W_{typ}.

Hazardous Area Signal (input)

CURRENT RANGES: 0-20 mA / 4-20 mA with field selectable DC offset suppression.

CURRENT INPUT IMPEDANCE: 50 Ω (overcurrent protected) with field selectable 5 V level shift.

VOLT RANGES: 0-1 V / 0.2-1 V — 0-5 V / 1-5 V — 0-10 V / 2-10 V with field selectable DC offset suppression.

VOLT INPUT IMPEDANCE: 100K Ω/Volt_{input}.

Safe Area Signal (output)

OPERATING MODES: Current Sink / Current Source / Voltage output.

OUTPUT CURRENT RANGE: 0-20 mA / 4-20 mA.

OUTPUT VOLTAGE RANGE: 0-5 V / 1-5 V (on internal 250 Ω shunt).
0-10 V / 2-10 V (on internal 500 Ω shunt).

WORKING VOLTAGE RANGE: 3 V_{Min} to 30 V_{Max}.

MAX OUTPUT COMPLIANCE: 13 Volt (650 Ω load at 20 mA).

RIPPLE CONTENT: 15 mV_{rms}.

Performance at Reference Conditions

CALIBRATION ACCURACY: < ±0.1% of full scale (current output).

LINEARITY: < ±0.1% of full scale.

TEMPERATURE INFLUENCE: < ±0.01%/°C of full scale on zero and span.

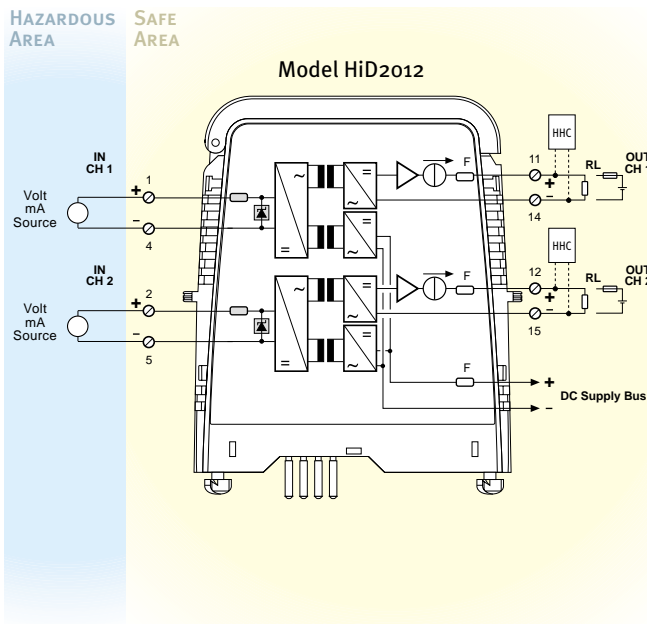
SELECTOR SWITCHES: Input type (voltage or current), input levels.
Output type (sink or source), internal shunts.

FACTORY SET AS: 4-20 mA input, 4-20 mA output, source mode.

FRONT PANEL ADJUSTMENT: Zero and span trimmers for each channel.

LED INDICATORS: Power ON (green).

- Dual (2012) channel.
- Voltage or current input.
- Voltage or current output.
- Sink and source mode outputs.
- HART® pass-through on current input.



Safety Description	Maximum External Parameters				
	GROUPS		Co	Lo	L/R
U _o = 2 V	CENELEC	USA	Co (μF)	Lo (mH)	L/R (μH/Ω)
I _o = 50 mA			II C	A-B	--
P _o = 45 mW	II B	C-E	--	--	--
U _i = 30 V	II A	D-F-G	--	--	--
I _i = 100 mA					
P _i = 750 mW					

PRELIMINARY INFORMATION





2025/2026

REPEATER POWER SUPPLY, SMART TRANSMITTER

Application

Provides a fully floating supply to power a two wire transmitter in a Hazardous Area, repeating the current to drive a Safe Area load. Bi-directional communication is provided for smart transmitters which use current modulation to transmit data and voltage modulation to receive data. Outputs are isolated from the inputs and are referenced to the power supply common.

Specification

DC Supply

CURRENT CONSUMPTION: 50 mA at 24 V, 20 mA output (per channel).

POWER DISSIPATION: 0.8 W at 24 V (per channel).

Hazardous Area Signal (input)

SIGNAL RANGE: 4-20 mA (overload limited at 26 mA typ.)

VOLTAGE AVAILABLE FOR TRANSMITTER AND LINES: 15.5 V min at 20 mA (ripple content 10 mV rms).

Safe Area Signal (output)

USER SELECTABLE: 4-20 mA or 1-5 V (on 250 Ω internal shunt).

RIPPLE CONTENT: 10 mV rms on 250 Ω load required for communications.

LOAD: 0 to 650 Ω.

LOAD EFFECT: ≤0.1% of full scale from 0 to 650 Ω.

FREQUENCY RESPONSE OF COMMUNICATION CHANNEL: (Tx to output and output to Tx), 0.5 KHz to 40 KHz within 3 db, (-6 db at 100 KHz).

Suitable for use with Smart transmitters using HART® or similar protocol.

RESPONSE TIME: 40 msec, 10 to 90% step change.

Performance at Reference Conditions

CALIBRATION ACCURACY: < ±0.1% of full scale. (current output).

LINEARITY: < ±0.1% of full scale.

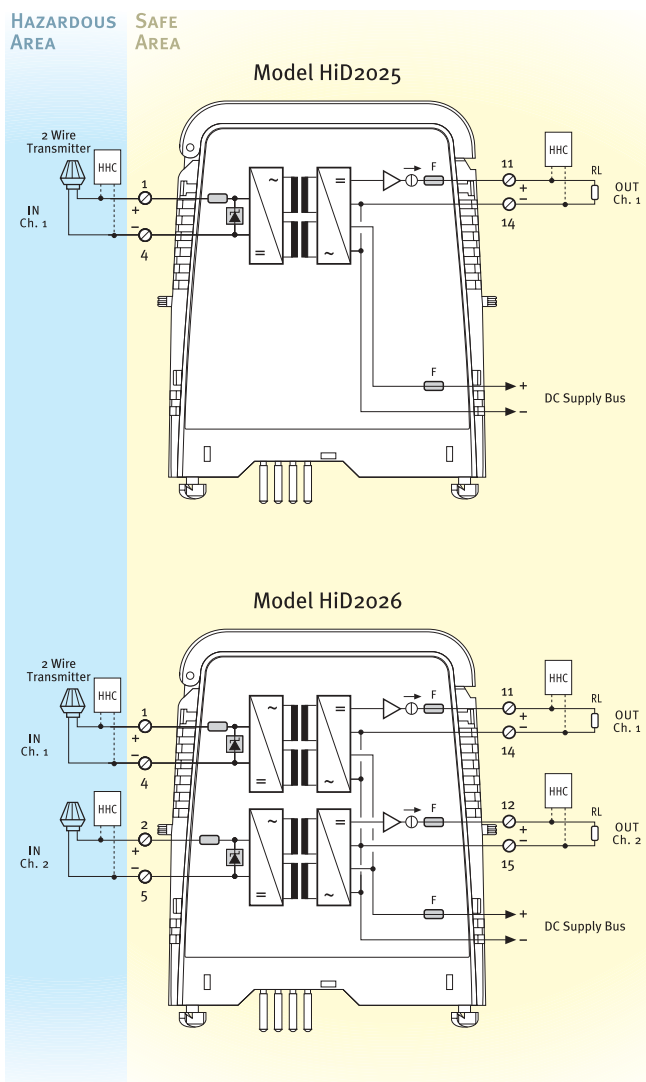
TEMPERATURE DRIFT: < ±0.01%/°C.

SELECTOR SWITCHES: Output 4-20 mA or 1-5 V. (250 Ω, 0.1% internal shunt).

FACTORY SET AS: 4-20 mA.

LED INDICATORS: Power on (green).

- Single (2025) and Dual (2026) channel.
- Smart Transmitter compatible.
- Low power dissipation.



Safety Description	Maximum External Parameters				
	GROUPS		Co	Lo	L/R
	CENELEC	USA	(μF)	(mH)	(μH/Ω)
U ₀ = 26 V	II C	A-B	0.099	4.1	58
I ₀ = 93 mA	II B	C-E	0.77	16.4	235
P ₀ = 605 mW	II A	D-F-G	2.6	32.8	470





2025SK/2026SK

REPEATER POWER SUPPLY,
SMART TRANSMITTER

Application

Provides a fully floating supply to power a two wire transmitter in a Hazardous Area, repeating the current in sink mode to simulate a two wire transmitter load in Safe Area.

Bi-directional communication is provided for smart transmitters which use current modulation to transmit data and voltage modulation to receive data. Outputs are isolated from the inputs and are referenced to the power supply common.

Suitable for use with Siemens Moore APACS, Quadlog and YISS systems.

Specification

DC Supply

CURRENT CONSUMPTION: 50 mA at 24 V, 20 mA output (per channel).

POWER DISSIPATION: 1.3 W at 24 V supply and 24 V external supply from DCS or PLC (per channel).

Hazardous Area Signal (input)

SIGNAL RANGE: 4-20 mA (overload limited at 26 mA typ.).

VOLTAGE AVAILABLE FOR TRANSMITTER AND LINES: 15.5 V min at 20 mA (ripple content 10 mV rms).

Safe Area Signal (output)

SINK MODE FROM EXTERNAL SUPPLY: 4-20 mA (overload limited at 26 mA typ.).

WORKING VOLTAGE RANGE: 7 V min. to 30 V max.

FREQUENCY RESPONSE OF COMMUNICATION CHANNEL: (Tx to output and output to Tx), 0.5 KHz to 40 KHz within 3 db, (-6 db at 100 KHz).

Suitable for use with Smart transmitters using HART® or similar protocol.

RESPONSE TIME: 40 msec, 10 to 90% step change.

Performance at Reference Conditions

CALIBRATION ACCURACY: $\lt \pm 0.1\%$ of full scale.

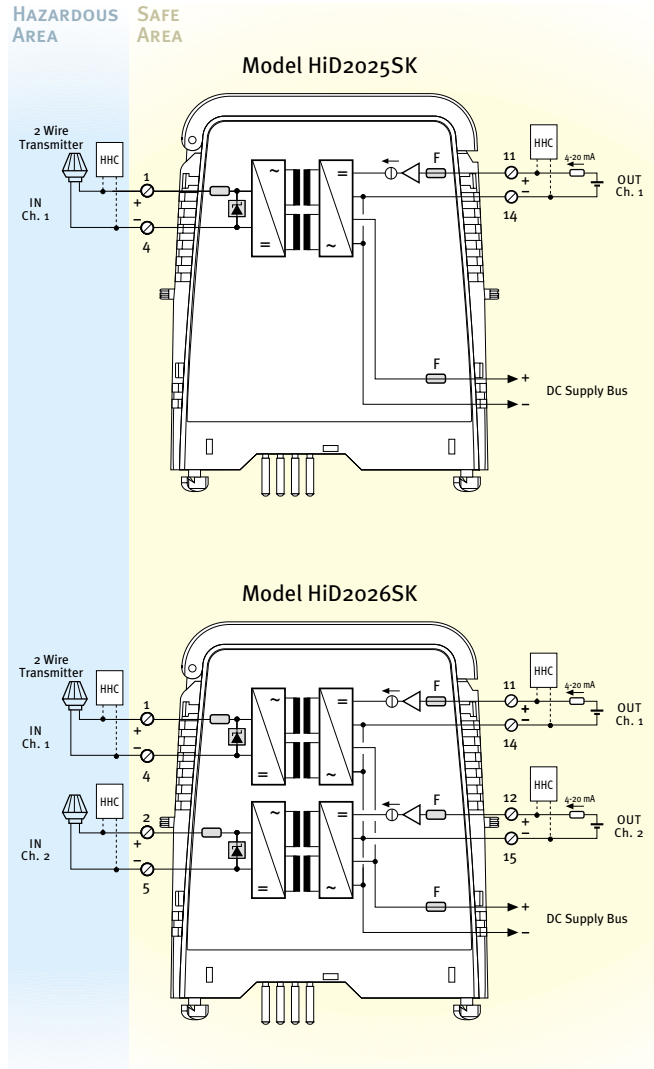
LINEARITY: $\lt \pm 0.1\%$ of full scale.

TEMPERATURE DRIFT: $\lt \pm 0.01\%/^{\circ}\text{C}$.

SELECTOR SWITCHES: none.

LED INDICATORS: Power on (green).

- Single (2025SK) and Dual (2026SK) channel.
- Smart Transmitter compatible.
- Current sink mode capability.



Safety Description	Maximum External Parameters				
	GROUPS CENELEC	USA	Co (μF)	Lo (mH)	L/R (μH/Ω)
U ₀ = 26 V	II C	A-B	0.099	4.1	58
I ₀ = 93 mA	II B	C-E	0.77	16.4	235
P ₀ = 605 mW	II A	D-F-G	2.6	32.8	470





2029/2030

REPEATER POWER SUPPLY,
SMART TX, FULLY FLOATING

Application

Provides a fully floating supply to power a two or three wire transmitter in a Hazardous Area, repeating the current to drive a Safe Area load. Bi-directional communication is provided for smart transmitters which use current modulation to transmit data and voltage modulation to receive data. Outputs are fully isolated from the inputs, the power supply and each other. A separate fault output is signalled if the input signal is outside the range 0.2 - 24 mA.

Specification

DC Supply

CURRENT CONSUMPTION: 60 mA at 24 V, 20 mA output (per channel).

POWER DISSIPATION: 1.05 W at 24 V (per channel).

Hazardous Area Signal (input)

VOLTAGE AVAILABLE FOR TRANSMITTER AND LINES: 15.5 V min at 20 mA (ripple content 10 mVrms).

INPUT RANGE: 4-20 mA (overload limited at 26 mA typical).

INPUT RESISTANCE FOR CURRENT SOURCE: 40 Ω.

HART COMS: Pass through to safe area. (Note: current sink terminals 4, 7, 5 and 6 do not pass HART® signal to safe area).

Safe Area Signal (output)

USER SELECTABLE: 4-20 mA or 1-5 V (on 250 Ω internal shunt).

LOAD: 0 to 650 Ω.

LOAD EFFECT: ≤0.1% of full scale from 0 to 650 Ω.

FREQUENCY RESPONSE OF COMMUNICATION CHANNEL: (tx to output and output to tx), 0.5 KHz to 40 KHz within 3 db, (-6 db at 100 KHz).

Suitable for use with Smart transmitters using HART® or similar protocol.

RESPONSE TIME: 70 msec, 10 to 90% step change.

Performance at Reference Conditions

CALIBRATION ACCURACY: < ±0.1% of full scale (current output).

LINEARITY: < ±0.05% of full scale.

TEMPERATURE DRIFT: < ±0.01%/°C.

NO FAULT DETECTION: > 1 mA or < 23.5 mA input current.

FAULT DETECTION: < 0.2 mA or > 24 mA input current.

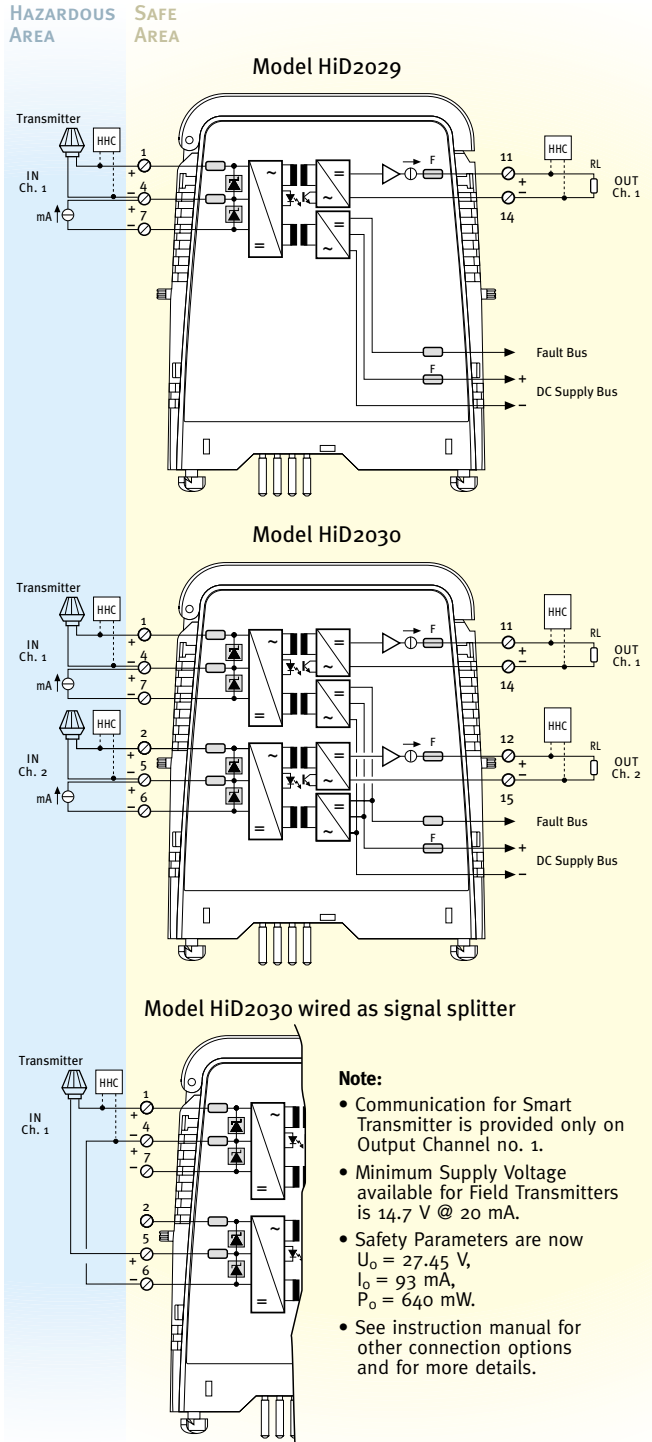
SELECTOR SWITCHES: Output 4-20 mA or 1-5 V. (250 Ω, 0.1% internal load).

FACTORY SET AS: 4-20 mA.

LED INDICATORS: Power on (green). Fault (red) each channel.

FAULT OUTPUT: Open collector transistor (common to both channels).

- Single (2029) and Dual (2030) channel.
- 2 or 3 wire Smart Transmitters.
- Fully floating outputs.
- Fault bus output.
- Suitable for 1 input and 2 outputs (Signal Splitter).



Note:

- Communication for Smart Transmitter is provided only on Output Channel no. 1.
- Minimum Supply Voltage available for Field Transmitters is 14.7 V @ 20 mA.
- Safety Parameters are now $U_o = 27.45 V$, $I_o = 93 mA$, $P_o = 640 mW$.
- See instruction manual for other connection options and for more details.

Term.	Safety Description	Maximum External Parameters				
		Groups CENELEC	USA	Co (μF)	Lo (mH)	L/R (μH/Ω)
1-4	$U_o = 26 V$	II C	A-B	0.099	4.1	58
	$I_o = 93 mA$	II B	C-E	0.77	16.4	235
2-5	$P_o = 605 mW$	II A	D-F-G	2.6	32.8	470
4-7*	$U_o = 1.2 V$	* SUITABLE FOR NON ENERGY STORING APPARATUS CONNECTION.				
5-6*	$I_o < 50 mA$					
	$P_o < 15 mW$					





2029SK/2030SK

REPEATER POWER SUPPLY,
SMART TX, FULLY FLOATING

Application

Provides a fully floating supply to power a two or three wire transmitter in a Hazardous Area, repeating the current in sink mode to simulate a two wire transmitter load in Safe Area.

Bi-directional communication is provided for smart transmitters which use current modulation to transmit data and voltage modulation to receive data. Outputs are fully isolated from the inputs, the power supply and each other. A separate fault output is signalled if the input signal is outside the range 0.2 - 24 mA.

Suitable for use with Siemens Moore APACS, Quadlog and YISS systems.

Specification

DC Supply

CURRENT CONSUMPTION: 40 mA at 24 V, 20 mA output (per channel).

POWER DISSIPATION: 1.05 W at 24 V supply, 24 V external supply from DCS or PLC (per channel).

Hazardous Area Signal (input)

VOLTAGE AVAILABLE FOR TRANSMITTER AND LINES: 15.5 V min at 20 mA (ripple content 10 mVrms).

INPUT RANGE: 4-20 mA (overload limited at 26 mA typical).

INPUT RESISTANCE FOR CURRENT SOURCE: 40 Ω.

HART COMS: Pass through to safe area. (Note: current sink terminals 4, 7, 5 and 6 do not pass HART® signal to safe area).

Safe Area Signal (output)

SINK MODE FROM EXTERNAL SUPPLY: 4-20 mA (overload limited at 24 mA typ.).

WORKING VOLTAGE RANGE: 7 V min. to 30 V max.

FREQUENCY RESPONSE OF COMMUNICATION CHANNEL: (tx to output and output to tx), 0.5 KHz to 40 KHz within 3 db. (-6 db at 100 KHz).

Suitable for use with Smart transmitters using HART® or similar protocol.

RESPONSE TIME: 70 msec, 10 to 90% step change.

Performance at Reference Conditions

CALIBRATION ACCURACY: < ±0.1% of full scale.

LINEARITY: < ±0.05% of full scale.

TEMPERATURE DRIFT: < ±0.01%/°C.

NO FAULT DETECTION: > 1 mA or < 23.5 mA input current.

FAULT DETECTION: < 0.2 mA or > 24 mA input current.

SELECTOR SWITCHES: none.

LED INDICATORS: Power on (green). Fault (red) each channel.

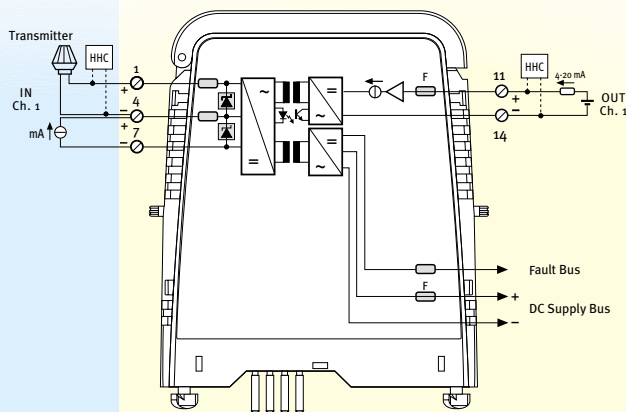
FAULT OUTPUT: Open collector transistor (common to both channels).

- Single (2029SK) and Dual (2030SK) channel.
- 2 or 3 wire Smart Transmitters.
- Current sink output capability.
- Fully floating outputs.
- Fault bus output.
- Suitable for 1 input and 2 outputs (Signal Splitter).

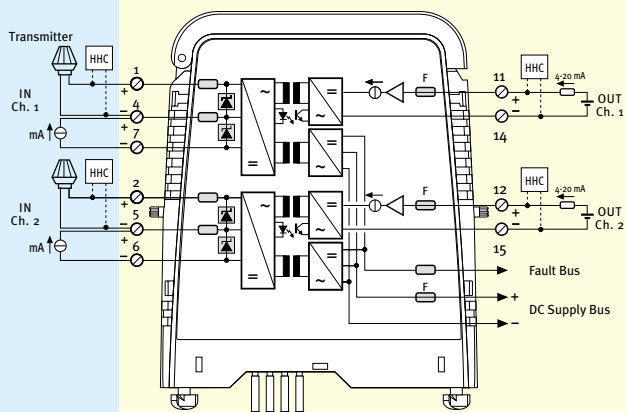
HAZARDOUS AREA

SAFE AREA

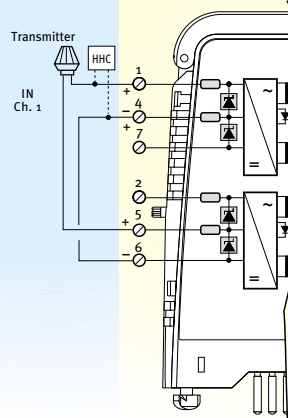
Model HiD2029SK



Model HiD2030SK



Model HiD2030SK wired as signal splitter



Note:

- Communication for Smart Transmitter is provided only on Output Channel no. 1.
- Minimum Supply Voltage available for Field Transmitters is 14.7 V @ 20 mA.
- Safety Parameters are now $U_o = 27.45 V$, $I_o = 93 mA$, $P_o = 640 mW$.
- See instruction manual for other connection options and for more details.

Term.	Safety Description	Maximum External Parameters				
		Groups CENELEC	USA	Co (µF)	Lo (mH)	L/R (µH/Ω)
1-4 2-5	$U_o = 26 V$	II C	A-B	0.099	4.1	58
	$I_o = 93 mA$	II B	C-E	0.77	16.4	235
	$P_o = 605 mW$	II A	D-F-G	2.6	32.8	470
4-7* 5-6*	$U_o = 1.2 V$	* SUITABLE FOR NON ENERGY				
	$I_o < 50 mA$	STORING APPARATUS CONNECTION.				
	$P_o < 15 mW$					





2031/2032

I/P DRIVER,
BUS POWERED

Application

Repeats a 4-20 mA input signal from a control system to drive I/P converters, valve actuators and displays located in a Hazardous Area. Each isolated channel has a low input impedance and allows complete freedom of connection in the input loop due to the high common mode compliance with respect to the supply. A field open circuit presents a high impedance to the control device input to allow alarm conditions to be monitored by control systems.

Specification

DC Supply

CURRENT CONSUMPTION: 35 mA at 24 V, 20 mA output (per channel).

POWER DISSIPATION: 0.75 W at 24 V (per channel).

Hazardous Area Signal (output)

OUTPUT: 4-20 mA on a load of 0 to 750 Ω max.

LOAD EFFECT: ≤0.1% of full scale from 0 to 750 Ω.

OUTPUT RIPPLE: 15 mV rms.

RESPONSE TIME: 50 msec, 10 to 90% step change.

Safe Area Signal (input)

INPUT CURRENT: 4-20 mA (reverse polarity protected).

Input drop-out < 4 V with field wiring intact.

Input current < 1.2 mA with field wiring open.

Performance at Reference Conditions

CALIBRATION ACCURACY: < ±0.1% of full scale.

LINEARITY: < ±0.1% of full scale.

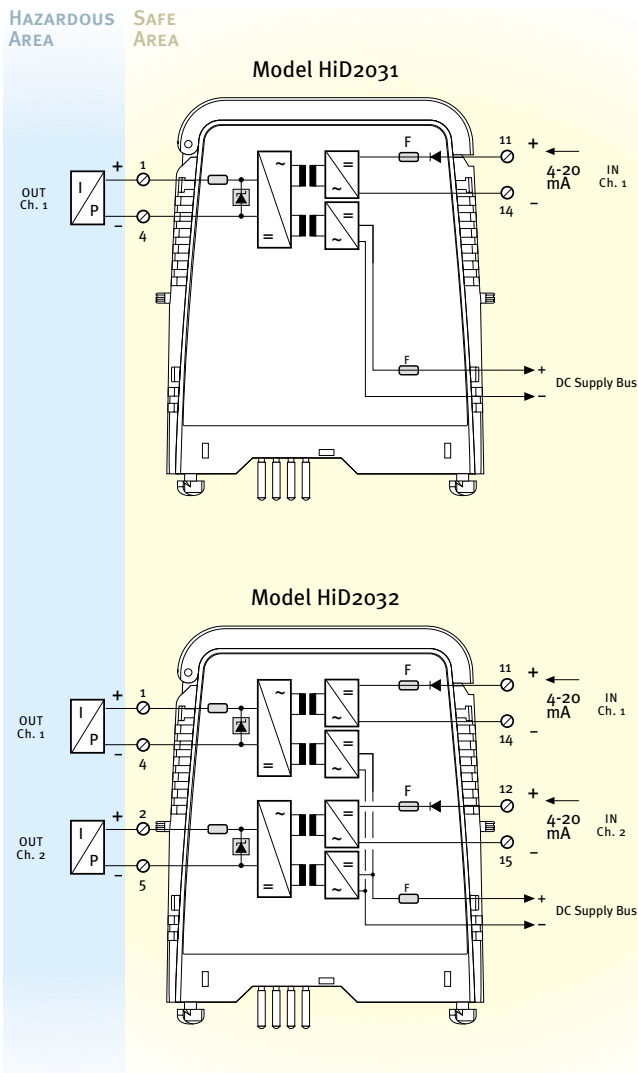
TEMPERATURE DRIFT: < ±0.01%/°C.

SELECTOR SWITCHES: none.

LED INDICATORS: power ON (green).

- Single (2031) and Dual (2032) channel.
- Bus powered 750 Ω load.
- Fully floating operation.
- Suitable for 1 input and 2 outputs.

(see Instruction Manual for details)



Safety Description	Maximum External Parameters				
	GROUPS		Co	Lo	L/R
	CENELEC	USA	(μF)	(mH)	(μH/Ω)
U ₀ = 26 V	II C	A-B	0.099	4.1	58
I ₀ = 93 mA	II B	C-E	0.77	16.4	235
P ₀ = 605 mW	II A	D-F-G	2.6	32.8	470





2033/2034

I/P DRIVER,
LOOP POWERED

Application

Repeats a 4-20 mA input signal from a control system to drive I/P converters, valve actuators and displays located in a Hazardous Area. Designed for high integrity applications, each channel is loop powered with a low voltage drop and permits detection of line faults, by the control system.

A field open circuit presents a high impedance to the control device input to allow alarm conditions to be monitored.

Specification

Hazardous Area Signal (output)

OUTPUT: 4-20 mA on a load of 0 to 500 Ω max.

LOAD EFFECT: $\leq 0.2\%$ of full scale from 0 to 500 Ω.

OUTPUT RIPPLE: 40 μA peak to peak.

RESPONSE TIME: 50 msec, 10 to 90% step change.

Safe Area Signal (input)

INPUT VOLTAGE: powered by the loop, 7 to 30 V max. (reverse polarity protected).

INPUT CURRENT: powered by the loop, 4-20 mA (voltage drop-out 7 V at 20 mA and 500 Ω load). Open circuit consumption ≤ 0.8 mA at 24 V.

POWER DISSIPATION: 0.14 W at 20 mA, per channel.

Performance at reference conditions

CALIBRATION ACCURACY: $\leq \pm 0.1\%$ of full scale.

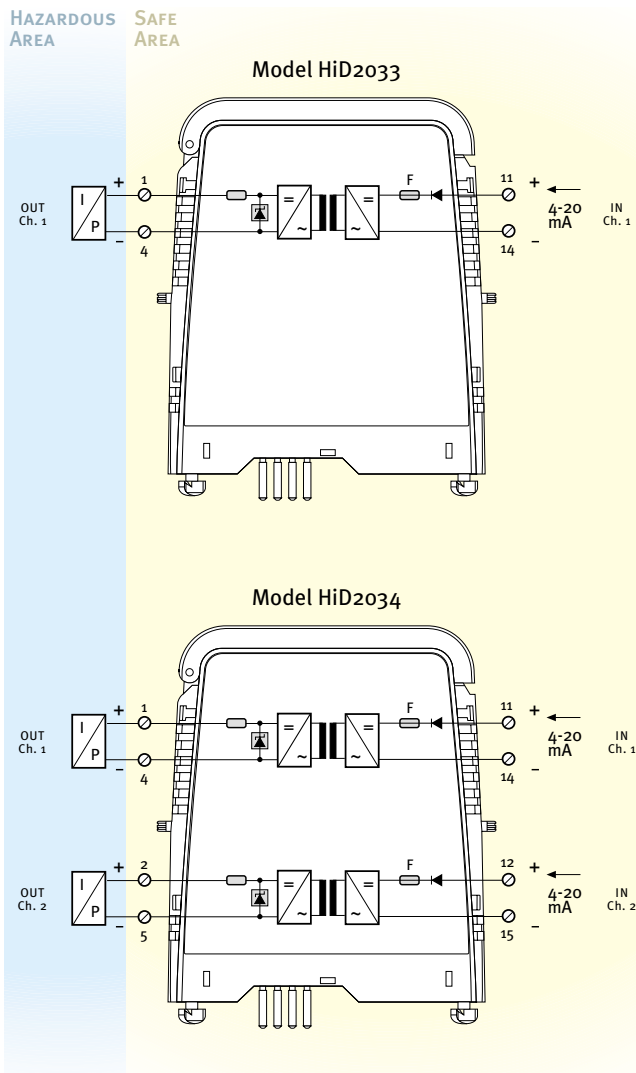
LINEARITY: $\leq \pm 0.1\%$ of full scale.

TEMPERATURE DRIFT: $\leq \pm 0.01\%/^{\circ}\text{C}$.

SELECTOR SWITCHES: none.

LED INDICATORS: none.

- Single (2033) and Dual (2034) channel.
- Loop powered.
- Low voltage drop.
- Fail safe operation.



Safety Description	Maximum External Parameters				
	GROUPS		Co (μF)	Lo (mH)	L/R (μH/Ω)
	CENELEC	USA			
U _o = 26 V	II C	A-B	0.099	4.1	58
I _o = 93 mA	II B	C-E	0.77	16.4	235
P _o = 605 mW	II A	D-F-G	2.6	32.8	470





2035/2036

LOOP POWERED ISOLATOR FOR
FIRE AND SMOKE DETECTORS

Application

These loop-powered isolators are primarily intended to interface with fire and smoke detectors, or with similar switched resistor systems requiring a wide output current range (1.5 to 50 mA) to operate correctly. They can also be used to drive a current to pressure (I/P) converter or in similar application requiring an analog output signal.

Specification

Hazardous Area Signal (output)

Fire and Smoke Detectors

OUTPUT: 1.5 - 50 mA.

OUTPUT CHARACTERISTIC (TYPICAL):

$$V_{out} = (V_{in} - 1.6) - (0.4 \times I_{out}) \quad 6V < V_{in} < 25V$$

$$V_{out} = (25 - 1.6) - (0.4 \times I_{out}) \quad 25V < V_{in} < 30V$$

ANALOG OUTPUT I/P APPLICATIONS

OUTPUT: 4-20 mA (on a load of 0 to 750 Ω max.).

LOAD EFFECT: ≤ 0.3% (of full scale from 0 to 750 Ω).

OUTPUT RIPPLE: 150 μA peak to peak.

Safe Area Signal (input)

OPERATING VOLTAGE RANGE: 6-30 V (powered by the loop, reverse polarity protected).

INPUT CURRENT: 1.5 - 50 mA (powered by the loop).

VOLTAGE DROP-OUT: 9.6 V @ 20 mA and 500 Ω load (4 V @ 4 mA).

OPEN CIRCUIT CONSUMPTION: < 0.6 mA @ 24 V.

Performance at reference conditions

CURRENT TRANSFER ERROR: < ±300 μA,
6 V < V_{in} < 25 V / 1.5 mA < I_{out} < 50 mA.

CALIBRATION ACCURACY: < ±0.1% of full scale (4-20 mA range).

LINEARITY: < ±0.1% of full scale (4-20 mA range).

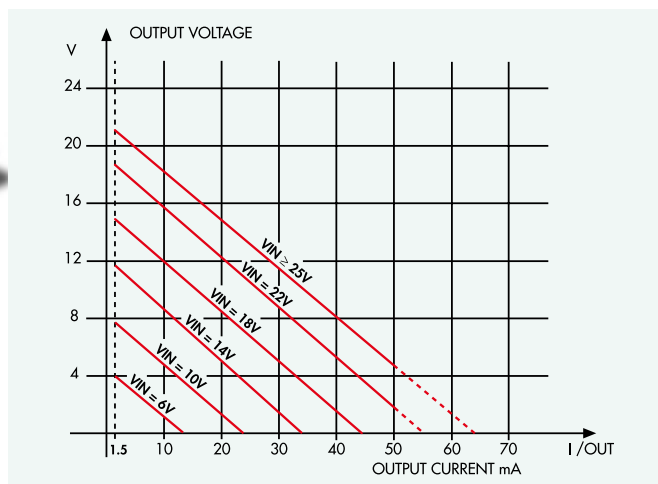
RESPONSE TIME: 50 msec. (10 to 90% step change).

POWER DISSIPATION: < 0.7 W @ 40 mA, 24 V (per channel).

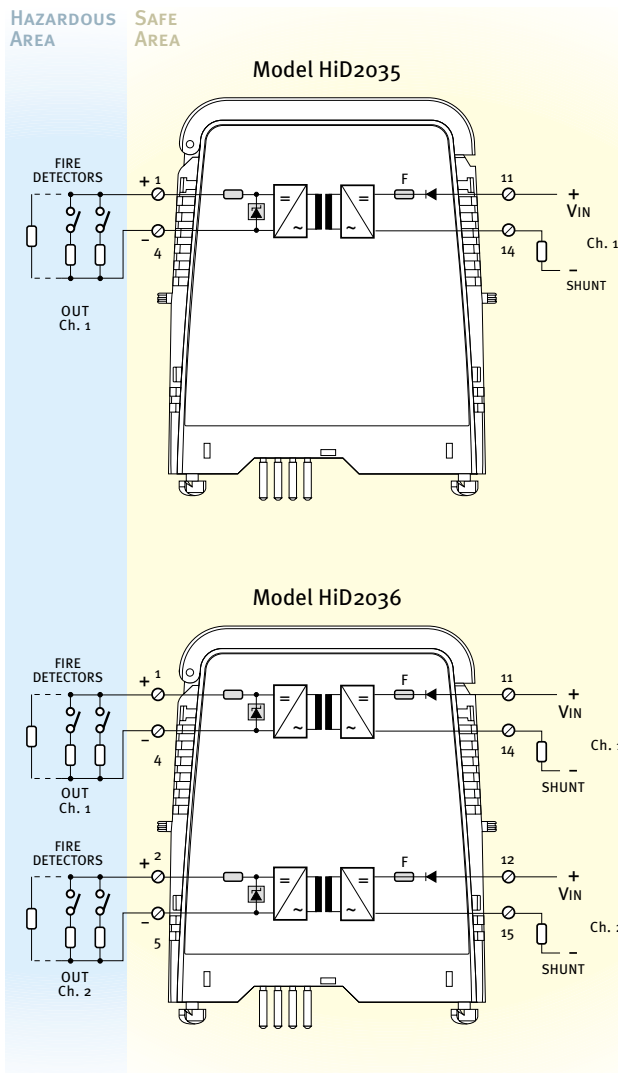
TEMPERATURE DRIFT: < ±0.01%/°C.

SELECTOR SWITCHES: none.

LED INDICATORS: none.



- Single (2035) and Dual (2036) channel.
- Wide operating current range (1.5 to 50 mA).
- Applicable also for loop powered analog output (I/P).
- High accuracy (±0.1%) in I/P applications.



Safety Description	Maximum External Parameters				
	GROUPS CENELEC	USA	Co (μF)	Lo (mH)	L/R (μH/Ω)
U ₀ = 26 V	II C	A-B	0.099	4.1	58
I ₀ = 93 mA	II B	C-E	0.77	16.4	235
P ₀ = 605 mW	II A	D-F-G	2.6	32.8	470





2037/2038

I/P DRIVER,
BUS POWERED, SMART

Application

Repeats a 4-20 mA input signal from a control system to drive I/P converters, electrovalve actuators and displays located in a Hazardous Area.

Designed for use with smart I/P and valve positioners, each isolated channel has a low input impedance and allows complete freedom of connection in the input loop due to the high common mode compliance with respect to the supply.

On the 2037 and 2038 a separate fault output is signalled if the field wiring is broken or shorted. A field open circuit presents a high impedance to the control device input.

For the 2038Y a field open circuit presents an impedance of around 50 K Ω to the DCS control system. This allows the Yokogawa DCS to perform normal internal alarm monitoring functions.

Specification

DC Supply

CURRENT CONSUMPTION: 40 mA at 24 V, 20 mA output (per channel).

POWER DISSIPATION: 0.85 W at 24 V (per channel).

Hazardous Area Signal (output)

OUTPUT: 4-20 mA on a load of 0 to 750 Ω max.

LOAD EFFECT: $\leq 0.1\%$ of full scale from a 0 to 750 Ω .

OUTPUT RIPPLE: 15 mV rms.

RESPONSE TIME: 50 msec, 10 to 90% step change.

Safe Area Signal (input)

INPUT CURRENT: 4-20 mA (reverse polarity protected). Input drop-out < 4 V with field wiring intact. Input current < 1.2 mA with field wiring open. Input current (2038Y) < 0.6 mA (> 47 K Ω) with field wiring open.

FREQUENCY RESPONSE OF COMMUNICATION CHANNEL: (field to input and input to field), 0.5 KHz to 40 KHz within 3 db, (-6 db at 100 KHz) for use with smart positioners using HART[®] protocol.

Performance at reference conditions

CALIBRATION ACCURACY: $< \pm 0.1\%$ of full scale.

LINEARITY: $< \pm 0.1\%$ of full scale.

TEMPERATURE DRIFT: $< \pm 0.01\%/^{\circ}\text{C}$.

SHORT WIRE FAULT DETECT: < 70 Ω .

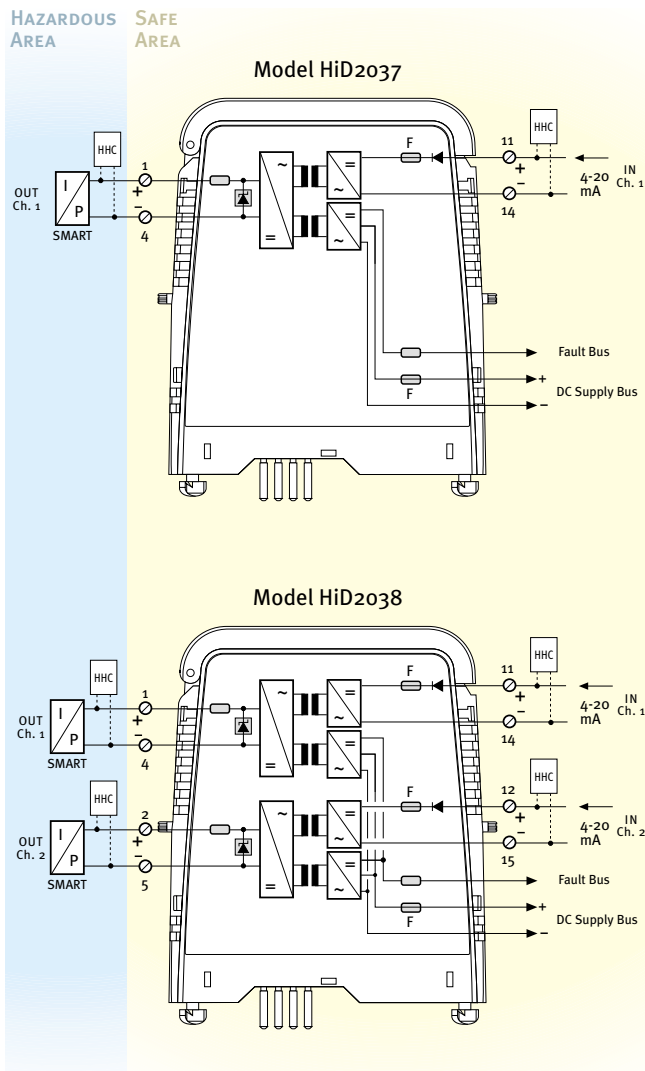
OPEN WIRE FAULT DETECT: > 100 K Ω .

SELECTOR SWITCHES: none.

LED INDICATORS: Power ON (green). Fault (red) each channel.

FAULT OUTPUT: Open collector transistor (common to both channels). (not applicable to 2038Y).

- Single (2037) and Dual (2038) channel.
- Dual (2038Y) channel for Yokogawa DCS system.
- Bus powered operation, 750 Ω load.
- Smart I/P and Valve positioners.
- Fault bus output. (not available on 2038Y).
- Suitable for 1 input and 2 outputs. (see Instruction Manual for details)



Safety Description	Maximum External Parameters				
	GROUPS		Co (μF)	Lo (mH)	L/R (μH/Ω)
	CENELEC	USA			
U _o = 26 V	II C	A-B	0.099	4.1	58
I _o = 93 mA	II B	C-E	0.77	16.4	235
P _o = 605 mW	II A	D-F-G	2.6	32.8	470





2061/2062

TEMPERATURE CONVERTER,
mV/TC

Application

Accepts thermocouple or mV input signals from a Hazardous Area and converts them to an isolated analogue current signal in the Safe Area. Each channel is fully independent, Input type, range and error handling parameters are configurable by switches and trimmers. Each module is supplied with a CJC (Cold Junction Compensator), which is mounted on the screw terminals (HAT). Outputs are isolated from input and referenced to the power supply common.

Specification

DC Supply

CURRENT CONSUMPTION: 30 mA at 24 V, 20 mA output (per channel).
POWER DISSIPATION: 0.6 W at 24 V (per channel).

Hazardous Area Signal (input)

USER SELECTABLE INPUT: mV-TC type B, E, J, K, N, R, S, T to IEC584-1 and L to GOST.

RANGE: -10 mV to + 100 mV.

SPAN LIMITS: 2.6 mV min, 100 mV max.

ZERO SUPPRESSION: $\pm 500\%$ of span.

Safe Area Signal (output)

USER SELECTABLE: 4-20 mA or 1-5 V (on 250 Ω internal shunt).

RIPPLE CONTENT: 10 mVrms.

LOAD: 0 to 650 Ω .

LOAD EFFECT: $\leq 0.1\%$ of full scale from 0 to 650 Ω .

Burnout

USER PROGRAMMABLE: upscale, downscale (burnout current 25 nA).

Performance at reference conditions

CALIBRATION ACCURACY: $< \pm 0.1\%$ of full scale (current output).

LINEARITY: $< \pm 0.1\%$ of full scale (terminal based mV in to mA out for TC).

TEMPERATURE INFLUENCE: $< \pm 0.01\%$ / $^{\circ}\text{C}$ on zero and span.

COMPENSATION ERROR: $\pm 0.5^{\circ}\text{C} \pm 0.05^{\circ}\text{C}$ / ($^{\circ}\text{C}$ deviation from reference temperature for TC).

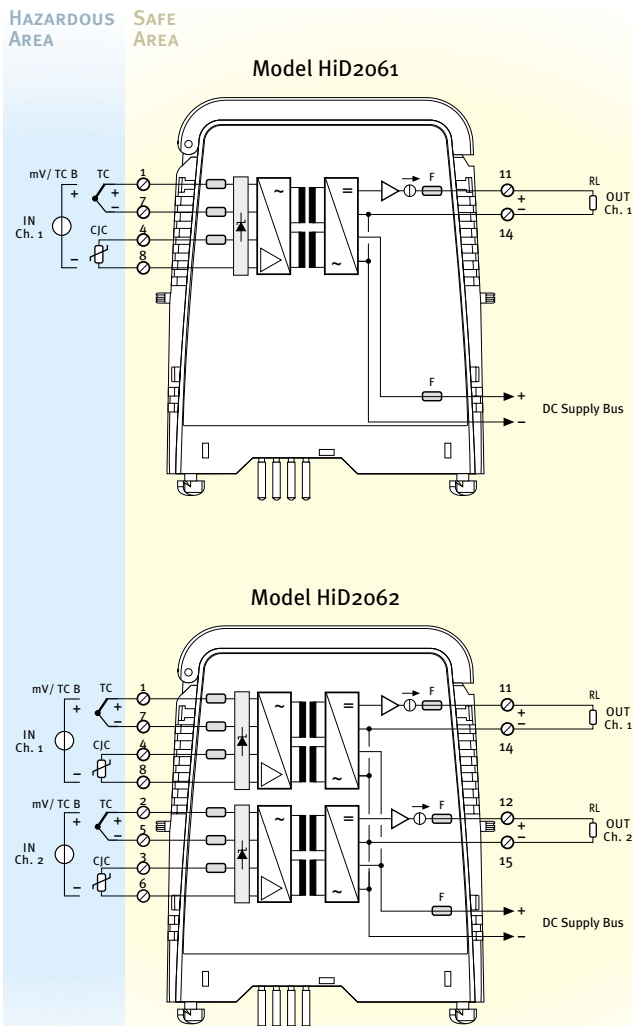
SELECTOR SWITCHES: Output 4-20 mA or 1-5 V, (250 Ω , 0.1% internal load). Thermocouple type. Burnout up/down. Input zero and span coarse settings.

FACTORY SET AS: 4-20 mA. TC type K. 0-500 $^{\circ}\text{C}$, up scale burn-out.

FRONT PANEL ADJUSTMENT: Zero and span trimmers for each channel.

LED INDICATORS: Power ON (green).

- Single (2061) and Dual (2062) channel.
- Configurable for thermocouples or mV inputs.
- Simple span and zero selection.
- Output proportional to mV input.



Safety Description	Maximum External Parameters				
	GROUPS		Co	Lo	L/R
	CENELEC	USA	(μF)	(mH)	($\mu\text{H}/\Omega$)
Uo = 13.2 V	II C	A-B	0.94	88	533
Io = 20 mA	II B	C-E	5.8	352	2133
Po = 66 mW	II A	D-F-G	21	704	4267





2071/2072

RTD/POTENTIOMETER CONVERTER

- Single (2071) and Dual (2072) channel.
- Configurable for 2, 3 or 4 wire RTD.
- Simple span and zero selection.
- Output proportional to temperature.
- Burnout up or down scale.

Application

Accepts input from Resistance Temperature Detectors (RTD) or Transmitting Potentiometers from a Hazardous Area and converts them to an isolated analog current signal in the Safe Area.

Each channel is fully independent, Input type, range and error handling parameters are configurable by switches and trimmers. Outputs are isolated from inputs and referenced to the power supply common.

Specification

DC Supply

CURRENT CONSUMPTION: 30 mA at 24 V, 20 mA output (per channel).

POWER DISSIPATION: 0.6 W at 24 V (per channel).

Hazardous Area Signal (input)

USER SELECTABLE

RTD: 2, 3 or 4 wire Pt 100 to DIN 43760.

Measuring current: 0.4 mA max.

Range: -200 °C to 850 °C.

Span limits: 40 °C min, 850 °C max.

Zero suppression $\pm 500\%$ of span.

POT.: Range: 100 Ω to 100 K Ω .

NOTE: when use potentiometer with more than 300 Ω value, a shunt resistor must be mounted in parallel to the potentiometer on the terminal block. See the HiD2000 instruction manual IM-R&D-111GB-PN991169 at chapter 10.1.2 for details.

Safe Area Signal (output)

Output is linear with temperature for Pt 100 RTD.

USER SELECTABLE: 4-20 mA or 1-5 V (on 250 Ω internal shunt).

RIPPLE CONTENT: 10 mVrms.

LOAD: 0 to 650 Ω .

LOAD EFFECT: $\leq 0.1\%$ of full scale from 0 to 650 Ω load change.

Burnout (not available on Pot. and RTD 4 wire).

USER PROGRAMMABLE: upscale, downscale.

Performance at reference conditions

CALIBRATION ACCURACY: $\leq \pm 0.1\%$ of full scale (current output).

LINEARITY: $\leq \pm 0.1\%$ of full scale (terminal based °C or °F input to mA out for Pt 100).

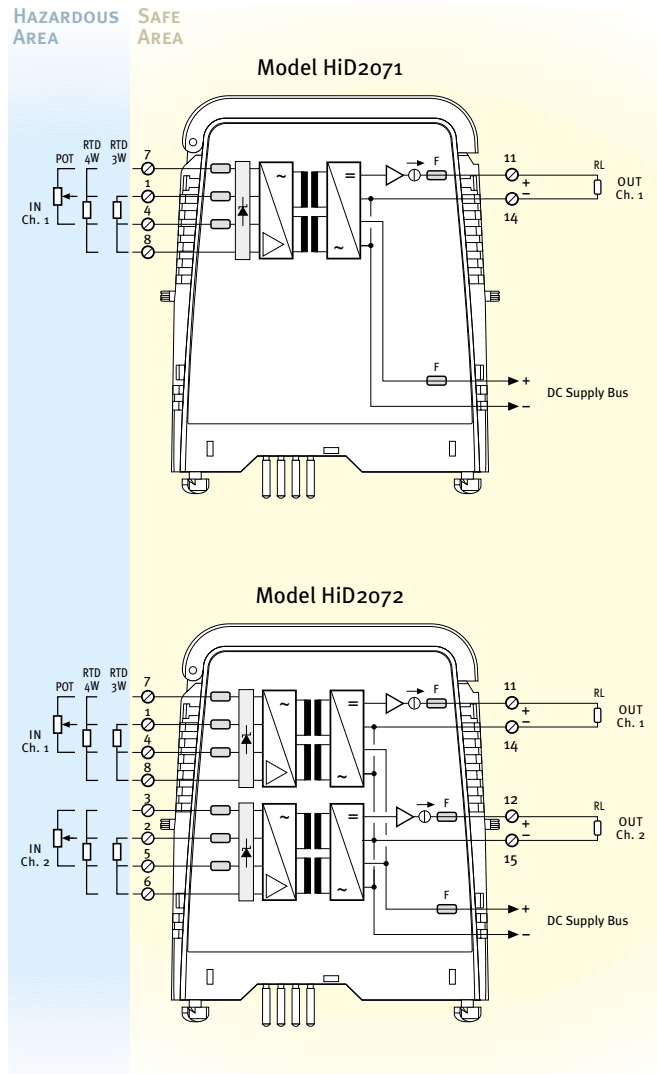
TEMPERATURE INFLUENCE: $\leq \pm 0.01\%$ / °C on zero and span.

SELECTOR SWITCHES: Output 4-20 mA or 1-5 V. (250 Ω , 0.1% internal load). Input type. Burnout up/down. Input zero and span coarse settings.

FACTORY SET AS: 4-20 mA. 3 wire RTD. 0-200 °C, upscale burn-out.

FRONT PANEL ADJUSTMENT: Zero and span trimmers for each channel.

LED INDICATORS: Power on (green).



Safety Description	Maximum External Parameters				
	GROUPS		Co (μF)	Lo (mH)	L/R (μH/Ω)
	CENELEC	USA			
Uo = 13.2 V	II C	A-B	0.94	88	533
Io = 20 mA	II B	C-E	5.8	352	2133
Po = 66 mW	II A	D-F-G	21	704	4267





2082

**TEMPERATURE CONVERTER,
mV/TC/Pot/RTD**

Application

Accepts thermocouple (TC), millivolt, potentiometer or Resistance Temperature Detectors (RTD) from a Hazardous Area and converts their information, with full linearisation, into analogue outputs.

Each channel is fully independant with input type, range and error handling parameters configurable through the pc interface using PACTware™.

The mV or TC inputs are fully isolated and the outputs are isolated from inputs and power supply.

The outputs can be selected as current source, current sink or voltage by switches.

Specification

DC Supply

CURRENT CONSUMPTION: 30 mA at 24 V, 20 mA output (per channel).

POWER DISSIPATION: 0.6 W at 24 V (per channel).

Hazardous Area Signal (input)

INPUT TYPE: mV range ± 100 mV.

TC B, E, J, K, N, R, S, T to IEC584-1, L to GOST standard.

RTD connection for 2-3-4 wire;

Pt 100, Pt 50, Pt 10; to IEC751 & GOST,

Cu100, Cu50, Cu10; to GOST,

Ni 100, to DIN43760.

Pot. 100 R to 20 K.

Safe Area Signal (output)

OUTPUT: linear with temperature for TC and RTD inputs.

USER SELECTABLE: 0/4-20 mA source, load 0-550R.

or 4-20 mA sink, working voltage 7 V to 30 V.

or 0/1-5 V (on 250 R internal shunt).

LOAD EFFECT: ≤0.1% of full scale from 0 to 550 Ω.

Burnout

USER PROGRAMMABLE: none, upscale, downscale.

Performance at reference conditions

CALIBRATION ACCURACY: ≤0.1% of full scale (current output).

LINEARITY: <±0.05% of full scale.

TEMPERATURE DRIFT: <±0.01%/ °C, ±0.005%/ °C typical.

COMPENSATION RANGE: -20 to +60 °C.

COMPENSATION ERROR: ±0.5 °C, ±0.05 °C/°C.

General

SELECTOR SWITCHES: Output: 4-20 mA current source.

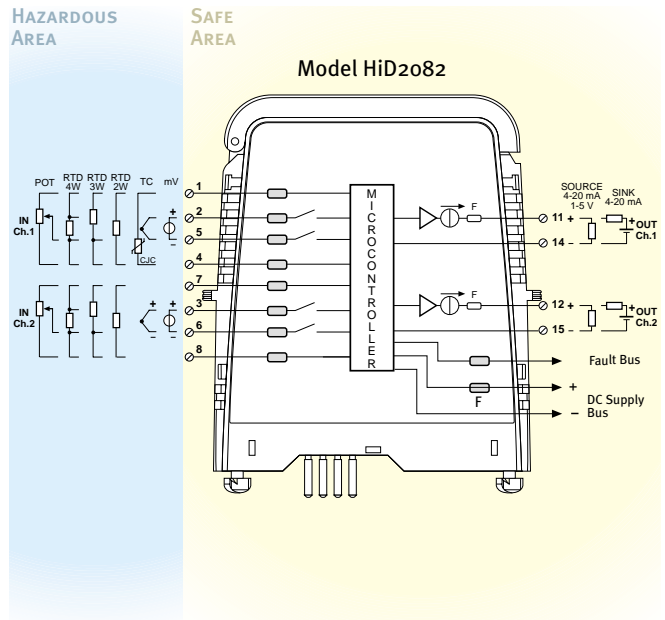
4-20 mA current sink.

1-5 V (250 Ω, 0.1% internal load).

LED INDICATORS: Power ON (green). Fault (red, per channel).

FAULT OUTPUT: Open collector transistor (common to both channels).

- Dual (2082) channel.
- Configurable for thermocouples or mV inputs, or potentiometer or 2/3/4 wire RTD input.
- Current output source and sink modes.
- Sensor burnout detection.
- Output proportional to temperature.
- Configured by PACTware™.



Safety Description	Maximum External Parameters				
	GROUPS CENELEC	USA	Co (µF)	Lo (mH)	L/R (µH/Ω)
U ₀ = 10 V	II C	A-B	3	158	957
I ₀ = 15 mA	II B	C-E	20.2	632	3828
P ₀ = 38 mW	II A	D-F-G	100	1260	7656





2821/22/24

SWITCH/PROXIMITY DETECTOR
REPEATER, RELAY OUTPUT

Application

Repeats the status of a voltage free contact or IS proximity sensor in a Hazardous Area to a relay output(s) in a Safe Area.

The line fault detection feature (primarily used with proximity sensors) de-energises the output relay (output status and output fault relays on 2821), with a LED indication and is signalled by a separate fault bus output on the termination board.

Fault detection can be used on normal switches providing two resistors are installed at the switch (see installation guide).

Specification

DC Supply

CURRENT CONSUMPTION: 15 mA at 24 V, relay energised (per channel).
40 mA at 24 V, relay energised (2821).

POWER DISSIPATION: 0.35 W at 24 V (per channel). 1 W at 24 V (2821).

Hazardous Area Signal (input)

INPUT: voltage free contact or proximity sensor to DIN 19234 (NAMUR).

THRESHOLD VALUES:

- 0 to 0.2 mA = wire break (fault for proximitor mode operation).
- 6.5 mA to max mA = wire short (fault for proximitor mode operation).
- 0.2 to 1.2 mA = contact open / proximity sensor with target.
- 2.1 to 6.5 mA = contact closed / proximity sensor without target.

Safe Area Signal (output)

RELAY OUTPUT: DPST per channel (2822).

SPST per channel (2824).

DPST per STATUS (2821).

Normally Energised DPST per FAULT, one pole NO, the other NC (2821).

CONTACT RATING: 50 Vdc, 0.5 A non inductive.

RESPONSE TIME: 20 msec.

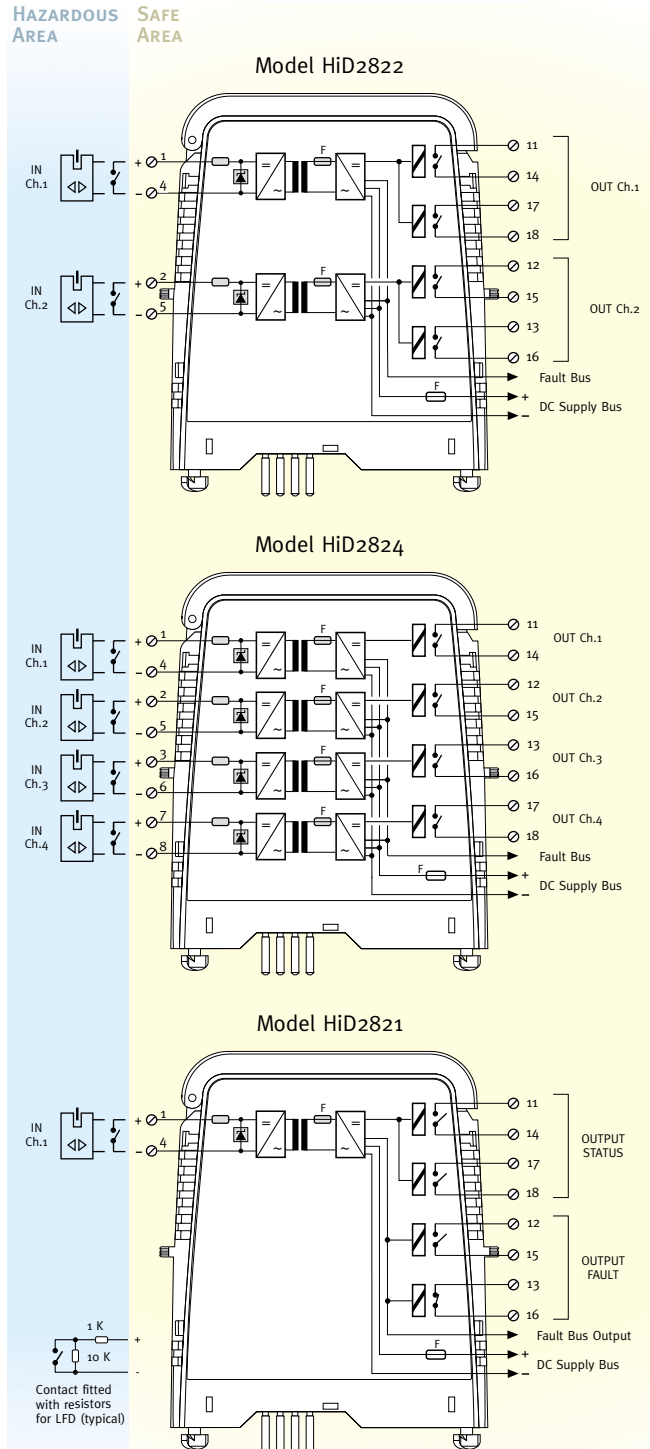
SELECTOR SWITCHES: Relay NE/ND (phase). Line fault detect enable/disable.

FACTORY SET AS: Input close relay energised. Relay NE. LFD enabled.

LED INDICATORS: Power on (green). Output status (yellow, per channel) on when relay energised. Fault (red, per channel).

FAULT OUTPUT: Open collector transistor (common to all channels).

- Single (2822) and Quad (2824) channel.
- Single (2821) channel for ESD applications.
- Switch or proximity detector input.
- Line fault detection.
- Relay output.
- Fault bus output.



Safety Description	Maximum External Parameters				
	GROUPS		Co	Lo	L/R
	CENELEC	USA	(μ F)	(mH)	(μ H/ Ω)
Uo = 13.2 V	II C	A-B	0.94	88	533
Io = 20 mA	II B	C-E	5.8	352	2133
Po = 66 mW	II A	D-F-G	21	704	4267





2842/2844

SWITCH/PROXIMITY DETECTOR REPEATER, OPEN COLL. OUTPUT

Application

Repeats the status of a voltage free contact or IS proximity sensor in a Hazardous Area to a solid state output(s) in a Safe Area. The line fault detection feature (primarily used with proximity sensors) de-energises the output signal, gives an LED indication and is signalled by a separate fault output on the termination board. Fault detection can be used on normal switches providing two resistors are installed at the switch (see installation guide).

Specification

DC Supply

CURRENT CONSUMPTION: 15 mA at 24 V, transistor close (per channel).

POWER DISSIPATION: 0.35 W at 24 V (per channel).

Hazardous Area Signal (input)

INPUT: voltage free contact or proximity sensor to DIN 19234 (NAMUR).

THRESHOLD VALUES:

0 to 0.2 mA = wire break (fault for proximitor mode operation).

6.5 mA to max mA = wire short (fault for proximitor mode operation).

0.2 to 1.2 mA = contact open / proximity sensor with target.

2.1 to 6.5 mA = contact closed / proximity sensor without target.

Safe Area Signal (output)

OUTPUT: Two optocoupled transistor per channel (2842).

One optocoupled transistor per channel (2844).

RATING: 30 Vdc, 50 mA (zener protected for inductive load).

LEAKAGE: 50 µA max (5 µA typical).

SATURATION VOLTAGE: max 1 V.

RESPONSE TIME: 150 µsec (2 KHz max frequency).

SELECTOR SWITCHES: Output NC/NO (phase).

Line fault detect enable/disable.

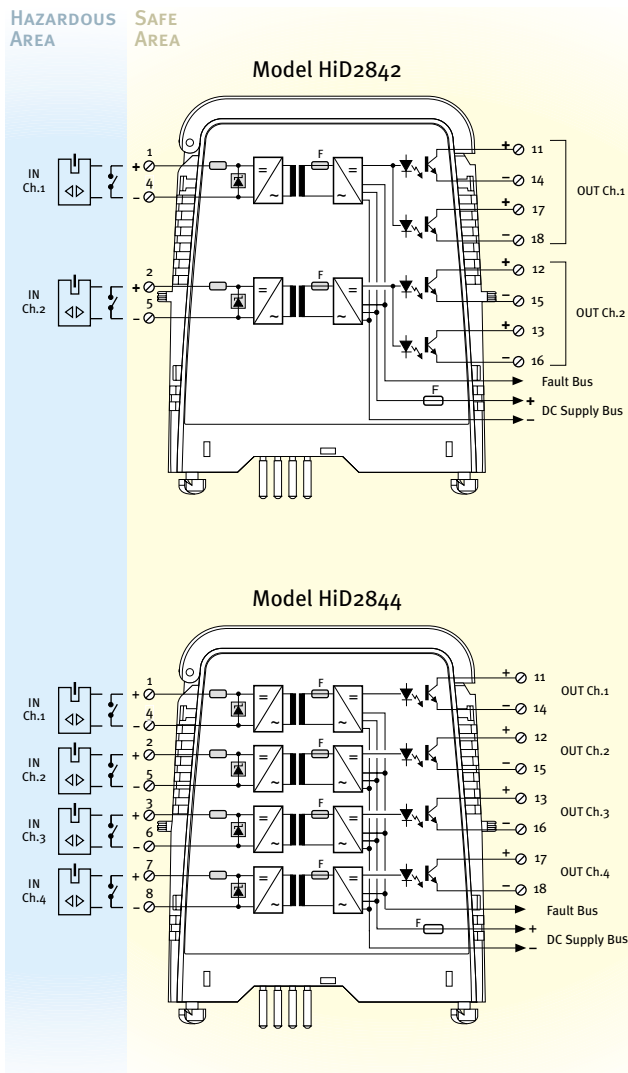
FACTORY SET AS: Input close. Transistor NC. LFD enabled.

LED INDICATORS: Power on (green). Output status (yellow, per channel).

Fault (red, per channel).

FAULT OUTPUT: Open collector transistor (common to all channels).

- Dual (2842) and Quad (2844) channel.
- Switch or proximity detector input.
- Line fault detection.
- Transistor output.
- Fault bus output.



Safety Description	Maximum External Parameters				
	GROUPS		Co (µF)	Lo (mH)	L/R (µH/Ω)
	CENELEC	USA			
U ₀ = 13.2 V	II C	A-B	0.94	88	533
I ₀ = 20 mA	II B	C-E	5.8	352	2133
P ₀ = 66 mW	II A	D-F-G	21	704	4267





2871/2872

**SOLENOID/ALARM DRIVER,
LOOP OR BUS POWERED**

Application

Energises intrinsically safe solenoid valves, alarm sounders, displays or LED indicators in a Hazardous Area from a loop powered Safe Area control signal, or controlled by a Safe Area switch contact or transistor. An alternative low current output is available for driving a single LED without installing an external current limiting resistor. Each channel can be loop-powered, ensuring high integrity operation and permitting current monitoring for detection of line fault. Status of each channel is signalled by an LED.

Specification

Hazardous Area Signal (output)

OUTPUT CHARACTERISTIC: see diagram below.

RESPONSE TIME (AT 300 Ω LOAD): Turn-on time 1 msec.
Turn-off time 8 msec.
Max. operating frequency 50 Hz.

Safe Area Signal (input)

INPUT CURRENT: 20 mA with open output. 70 mA with 300 Ω load.
75 mA with shorted output.
POWER DISSIPATION: 1.2 W at 24 V, 300 Ω load (per channel).

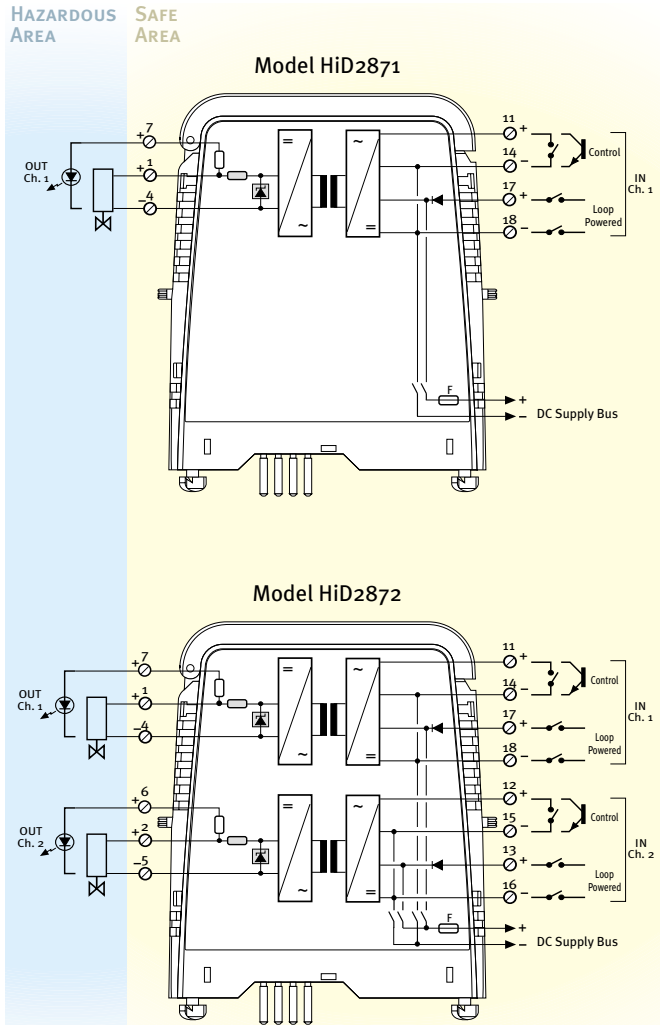
LOOP POWERED:

INPUT VOLTAGE: Powered by the loop, 21 - 30 Vdc, reverse polarity protected.
INRUSH CURRENT: 1A, 0.5 msec.

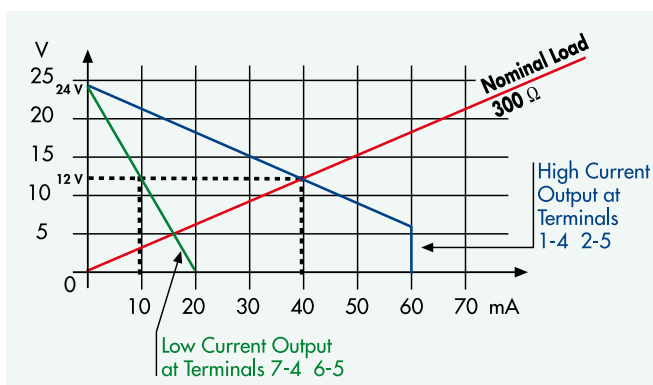
BUS POWERED:

CONTROL SIGNAL: Voltage free contact or open collector. Output on with contact close or transistor on. Output off with contact open or transistor off.
SELECTOR SWITCHES: Loop powered. Bus powered with control. Loop power with control.
FACTORY SET AS: Bus Power with control.
LED INDICATORS: Bus or Loop Power on (green per channel) output status (yellow, per channel).

- Single (2871) and Dual (2872) channel.
- Loop or bus powered operation.
- Low current output for LEDs.
- Dual input drive for DCS and/or ESD control.



Output Characteristic



Safety Description	Maximum External Parameters				
	GROUPS CENELEC	USA	Co (μF)	Lo (mH)	L/R (μH/Ω)
U _o = 26 V	II C	A-B	0.099	2.9	49
I _o = 110 mA	II B	C-E	0.77	11.7	198
P _o = 715 mW	II A	D-F-G	2.6	23.5	397

NOTE: when both channels of HiD2872 are operated in normally energised condition, either the load must be reduced or increased spacing/ventilation be applied to reduce the temperature rise. Contact Pepperl + Fuchs Elcon for guidance, or consult the Instruction Manual for more details.





2873/2874

**SOLENOID/ALARM DRIVER,
BUS POWERED**

- Single (2873) and Dual (2874) channel.
- Bus Powered.
- Fault bus output.

Application

Energises intrinsically safe solenoid valves, alarm sounders or displays in a Hazardous Area controlled by a Safe Area contact, transistor or logic-level signal.

Line faults (open and shorted) can be detected and signalled by LED and fault output signal. Status of each channel is signalled by an LED.

Specification

DC Supply

CURRENT CONSUMPTION: 65 mA at 24 V, 300 Ω load (per channel).

POWER DISSIPATION: 1.1 W at 24 V, 300 Ω load (per channel).

Hazardous Area Signal (output)

OUTPUT CHARACTERISTIC: see diagram below.

RESPONSE TIME (AT 300 Ω LOAD): Turn-on time 1 msec. Turn-off time 2 msec. Max. operating frequency 250 Hz.

Safe Area Signal (input)

CONTROL INPUT: External switch (dry contact or open collector) non isolated or logic level input fully floating.

OPERATION MODE: Output on with contact close, transistor on or logic level > 4 V. Output off with contact open, transistor off or logic level < 1.5 V.

NOMINAL LOAD: >100 Ω to < 5 K Ω.

SHORT WIRE FAULT DETECT: <25 Ω typical.

OPEN WIRE FAULT DETECT: >100 K Ω typical.

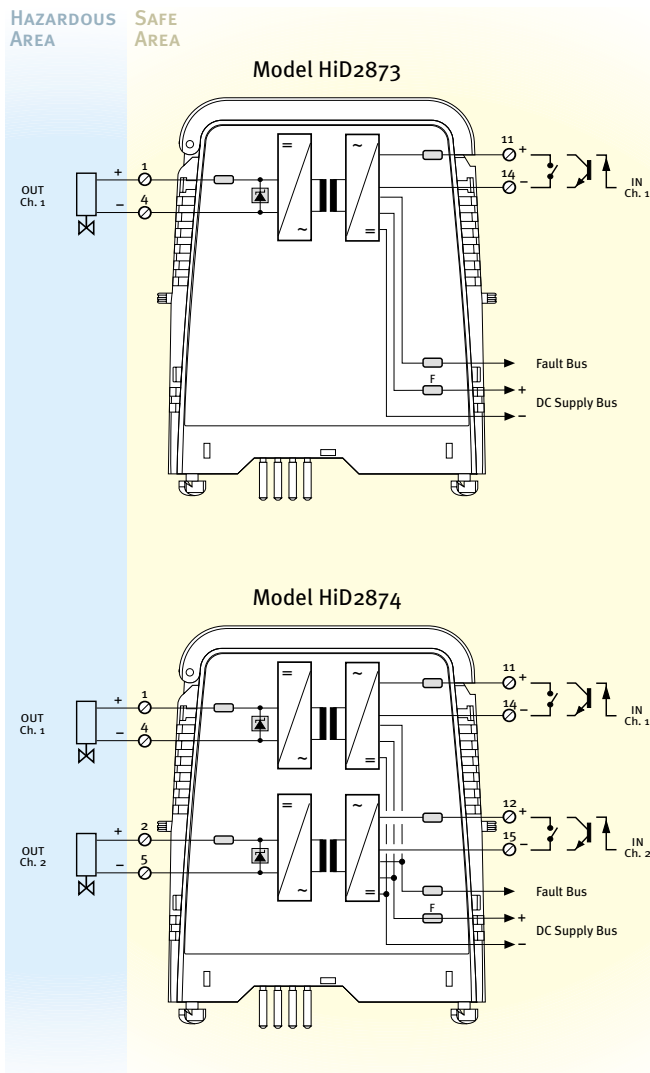
FAULT DETECT CURRENT: 4 mA typical.

SELECTOR SWITCHES: Input logic level (fully floating). Input dry contact or open collector.

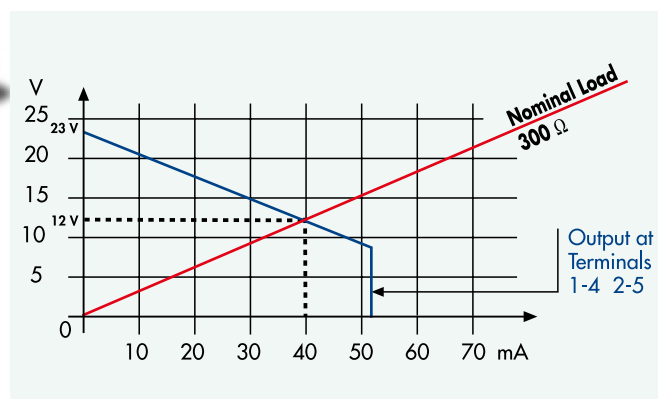
FACTORY SET AS: Input dry contact.

LED INDICATORS: Power ON (green). Output status (yellow, per channel). Line fault (red, per channel).

FAULT OUTPUT: Open collector transistor (common to both channels).



Output Characteristic



Safety Description	Maximum External Parameters				
	GROUPS		Co (μF)	Lo (mH)	L/R (μH/Ω)
	CENELEC	USA			
U ₀ = 26 V	II C	A-B	0.099	2.9	49
I ₀ = 110 mA	II B	C-E	0.77	11.7	198
P ₀ = 715 mW	II A	D-F-G	2.6	23.5	397

NOTE: when both channels of HiD2874 are operated in normally energised condition, either the load must be reduced or increased spacing/ventilation be applied to reduce the temperature rise. Contact Pepperl + Fuchs Elcon for guidance, or consult the Instruction Manual for more details.





2875/2876

**SOLENOID/ALARM DRIVER,
LOOP OR BUS POWERED**

Application

Energises intrinsically safe solenoid valves, alarm sounders, displays or LED indicators in a Hazardous Area from a loop powered Safe Area control signal, or controlled by a Safe Area switch contact or transistor.

An alternative low current output is available for driving a single LED without installing an external current limiting resistor.

Each channel can be loop-powered, ensuring high integrity operation and permitting current monitoring for detection of line fault. Status of each channel is signalled by an LED.

Similar to HiD2871/2872 but with $I_o = 93 \text{ mA}$.

Specification

Hazardous Area Signal (output)

OUTPUT CHARACTERISTIC: see diagram below.

RESPONSE TIME (AT 300 Ω LOAD): Turn-on time 1 msec. Turn-off time 8 msec. Max. operating frequency 50 Hz.

Safe Area Signal (input)

INPUT CURRENT: 30 mA with open output. 70 mA with 300 Ω load. 80 mA with shorted output.

POWER DISSIPATION: 1.2 W at 24 V, 300 Ω load (per channel).

LOOP POWERED:

INPUT VOLTAGE: Powered by the loop, 21 - 30 Vdc, reverse polarity protected.

INRUSH CURRENT: 1A, 0.5 msec.

BUS POWERED:

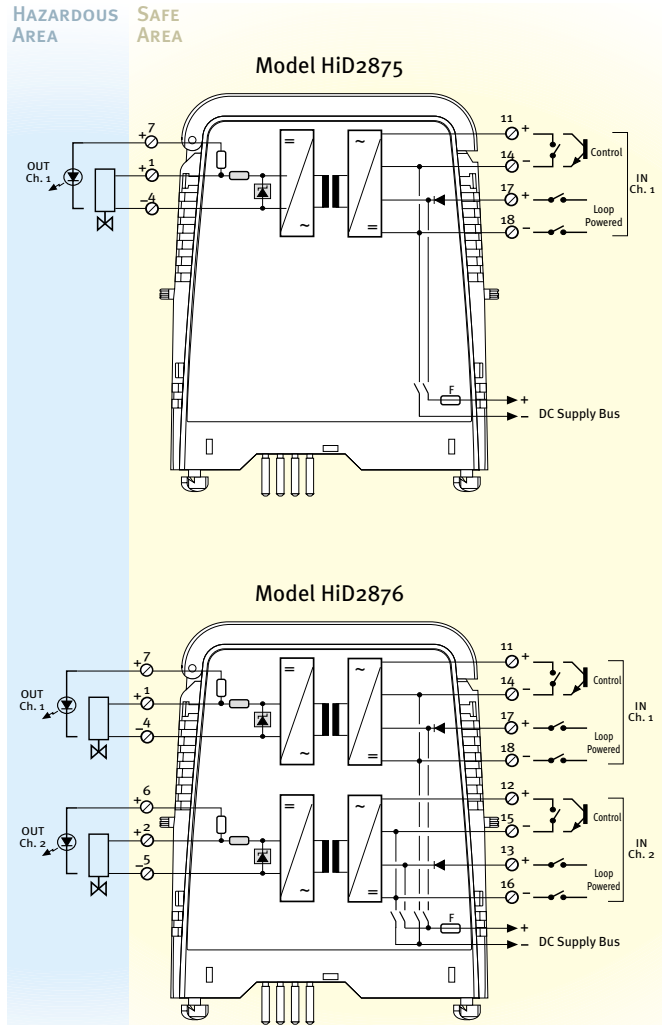
CONTROL SIGNAL: Voltage free contact or open collector. Output on with contact close or transistor on. Output off with contact open or transistor off.

SELECTOR SWITCHES: Loop powered. Bus powered with control. Loop power with control.

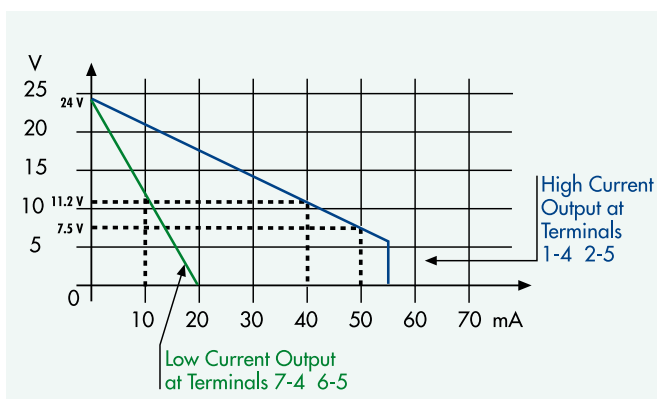
FACTORY SET AS: Bus Power with control.

LED INDICATORS: Bus or Loop Power on (green per channel) output status (yellow, per channel).

- Single (2875) and Dual (2876) channel.
- Loop or bus powered operation.
- Low current output for LEDs.
- $I_o = 93 \text{ mA}$ Safety Parameter.
- Dual input drive for DCS and/or ESD control.



Output Characteristic



Safety Description	Maximum External Parameters				
	GROUPS CENELEC	USA	Co (μF)	Lo (mH)	L/R (μH/Ω)
$U_o = 26 \text{ V}$	II C	A-B	0.099	4.1	58
$I_o = 93 \text{ mA}$	II B	C-E	0.77	16.4	235
$P_o = 605 \text{ mW}$	II A	D-F-G	2.6	32.8	470

NOTE: when both channels of HiD2876 are operated in normally energised condition, either the load must be reduced or increased spacing/ventilation be applied to reduce the temperature rise. Contact Pepperl + Fuchs Elcon for guidance, or consult the Instruction Manual for more details.





2877/2878

SOLENOID/ALARM DRIVER,
BUS POWERED

- Single (2877) and Dual (2878) channel.
- Bus powered.
- Fault bus output.
- $I_o = 93 \text{ mA}$ Safety Parameter.

Application

Energises intrinsically safe solenoid valves, alarm sounders or displays in a Hazardous Area controlled by a Safe Area contact, transistor or logic-level signal.

Line faults (open and shorted) can be detected and signalled by LED and fault output signal. Status of each channel is signalled by an LED. Similar to HiD2873/2874 but with $I_o = 93 \text{ mA}$.

Specification

DC Supply

CURRENT CONSUMPTION: 60 mA at 24 V, 300 Ω load (per channel).

POWER DISSIPATION: 1 W at 24 V, 300 Ω load (per channel).

Hazardous Area Signal (output)

OUTPUT CHARACTERISTIC: see diagram below.

RESPONSE TIME (AT 300 Ω LOAD): Turn-on time 1 msec. Turn-off time 2 msec. Max. operating frequency 250 Hz.

Safe Area Signal (input)

CONTROL INPUT: External switch (dry contact or open collector) non isolated or logic level input fully floating.

OPERATION MODE: Output on with contact close, transistor on or logic level $> 4 \text{ V}$. Output off with contact open, transistor off or logic level $< 1.5 \text{ V}$.

NOMINAL LOAD: $> 100 \Omega$ to $< 5 \text{ K}\Omega$.

SHORT WIRE FAULT DETECT: $< 25 \Omega$ typical.

OPEN WIRE FAULT DETECT: $> 100 \text{ K}\Omega$ typical.

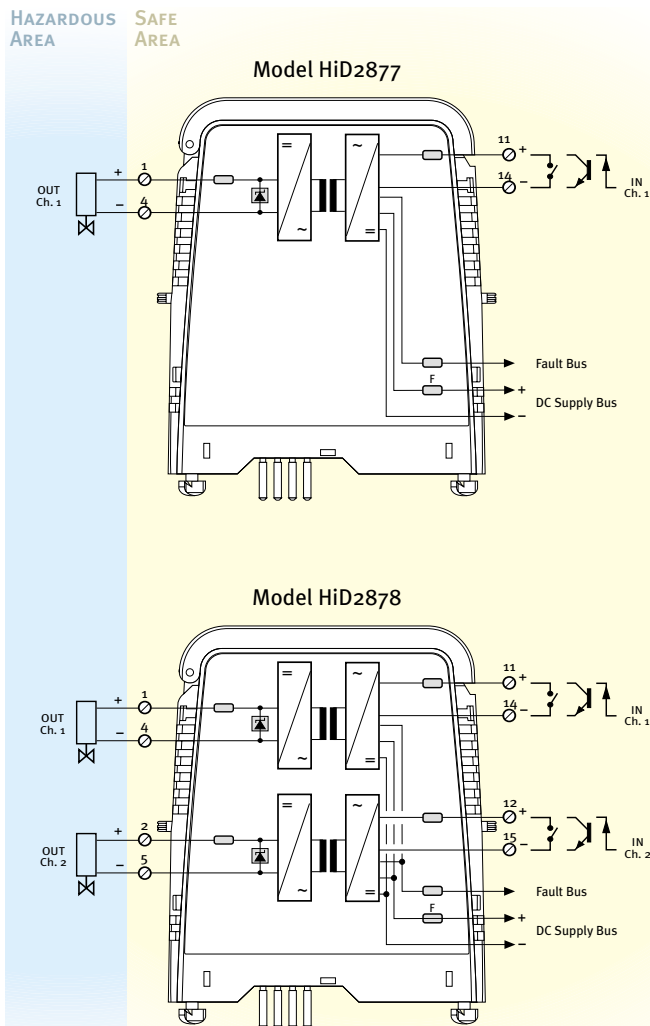
FAULT DETECT CURRENT: 4 mA typical.

SELECTOR SWITCHES: Input logic level (fully floating). Input dry contact or open collector.

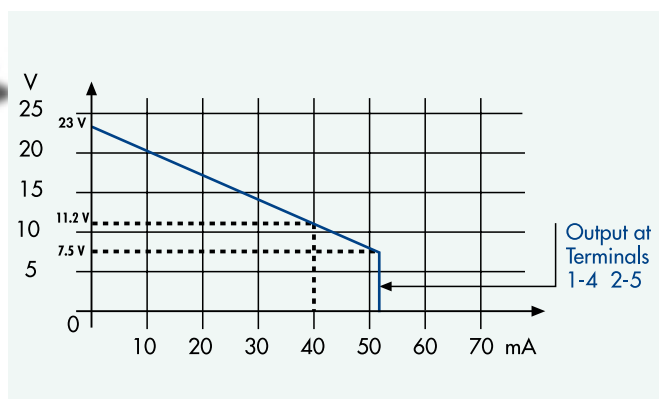
FACTORY SET AS: Input dry contact.

LED INDICATORS: Power ON (green). Output status (yellow, per channel). Line fault (red, per channel).

FAULT OUTPUT: Open collector transistor (common to both channels).



Output Characteristic



Safety Description	Maximum External Parameters				
	GROUPS CENELEC	USA	Co (μF)	Lo (mH)	L/R ($\mu\text{H}/\Omega$)
$U_o = 26 \text{ V}$	II C	A-B	0.099	4.1	58
$I_o = 93 \text{ mA}$	II B	C-E	0.77	16.4	235
$P_o = 605 \text{ mW}$	II A	D-F-G	2.6	32.8	470

NOTE: when both channels of HiD2878 are operated in normally energised condition, either the load must be reduced or increased spacing/ventilation be applied to reduce the temperature rise. Contact Pepperl + Fuchs Elcon for guidance, or consult the Instruction Manual for more details.





2881

SOLENOID/ALARM DRIVER, LOOP OR BUS POWERED, IIB OUTPUT

Application

Energises intrinsically safe solenoid valves in a Hazardous Area controlled by a Safe Area contact, transistor or logic level. A further programming mode allows the unit to be totally control loop powered ensuring high integrity operation. Line faults (open and short) can be detected and signalled by a LED, a fault bus output signal and an isolated transistor which is energised in case of fault. The high output power (60 mA at 13 V) is suitable for Gas Group IIB and IIA (Cenelec) or C-D (USA).

Specification

DC Supply (Bus Powered Mode)

CURRENT CONSUMPTION: 80 mA at 24 V, 300 Ω load.
POWER DISSIPATION: 1,3 W at 24 V, 300 Ω load.

HAZARDOUS AREA SIGNAL (output)

OUTPUT CHARACTERISTIC: see diagram.
RESPONSE TIME (AT 300 Ω LOAD): Turn-on time 2 msec. Turn-off time 8 msec. Max. operating frequency 50 Hz.

Safe Area Signal (input)

LOOP POWERED:

INPUT VOLTAGE: Powered by the loop, 21 - 30 Vdc, reverse polarity protected.
INRUSH CURRENT: 1A, 2 msec.

BUS POWERED:

CONTROL INPUT: external switch (dry contact or open collector) non isolated or logic level input fully floating.
OPERATION MODE: Output on with contact close, transistor on or logic level > 4 V. Output off with contact open, transistor off or logic level < 1.5 V.
NOMINAL LOAD: >100 Ω to < 5 K Ω.

SHORT WIRE FAULT DETECT: < 25 Ω typical.
OPEN WIRE FAULT DETECT: >100 KΩ typical.

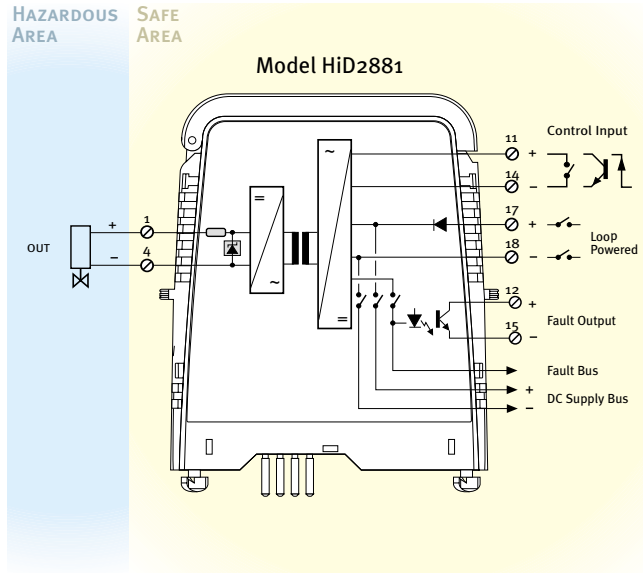
FAULT DETECT CURRENT: 4 mA typical.

SELECTOR SWITCHES: Loop powered or bus powered. Input logic level (fully floating). Input dry contact or open collector. Fault output enable/disable.

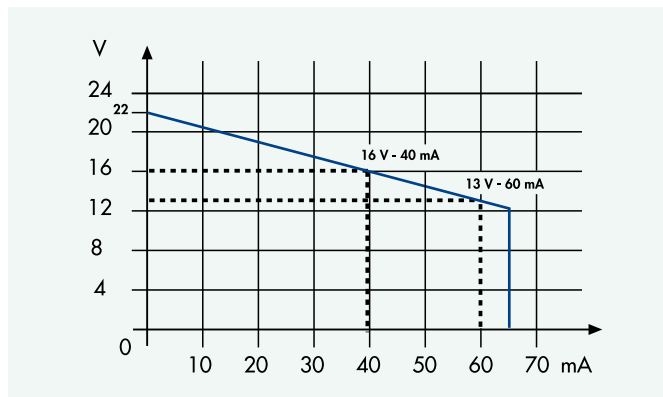
FAULT OUTPUT: Open collector transistor on common bus and optocoupled transistor (rating 30 V, 50 mA Max.).

LED INDICATORS: Power ON (green). Output status (yellow). Line fault (red).
FACTORY SET AS: Bus powered, Input dry contact, fault output enable.

- Single channel.
- Loop or bus powered operation.
- High output power for IIB gas group.
- Line fault detection.
- Separate fault output.
- Dual input drive for DCS and/or ESD control.



Output Characteristic



Safety Description	Maximum External Parameters				
	GROUPS CENELEC	GROUPS USA	Co (μF)	Lo (mH)	L/R (μH/Ω)
Uo = 26 V	II B	C-E	0.77	4.2	118
Io = 184 mA	II A	D-F-G	2.6	8.4	237
Po = 1.2 W					



Mux2700

32 CHANNEL HART® MULTIPLEXER

Application

The Mux2700 HART® Multiplexer provides 32 signal channels for connection to “smart” transmitters or control devices supporting digital communication according to the HART® standard. Alternatively up to 16 HART® only (i.e. no 4-20mA signal) devices can be connected to each channel in multidrop configuration. Full three-port isolation is included and each input channel has dual capacitor isolation for freedom of loop connection. It acts as a gateway between a workstation - typically a PC with suitable PAM software - and the field instrumentation. Each Mux2700 is networked simply by connecting the high-speed RS485 output in multidrop configuration. The Mux2700 interrogates each field device, under the supervision of the workstation, retrieving information for storage in its internal database, which can then be accessed at ease.

Specification

DC Supply

CURRENT CONSUMPTION: 28 mA at 24 V typical, RS485 quiescent.

POWER DISSIPATION: 0.7 W at 24 V.

Signal Channels

NUMBER OF CHANNELS: 32.

DC ISOLATION: dual capacitor each channel.

COMMON MODE VOLTAGE: up to 30 V.

DIFFERENTIAL MODE CLAMPING: ± 5.2 V (for transient or ac signals).

COMMON MODE CLAMPING: ± 10 V (for transient or ac signals).

RECEIVE SIGNAL RANGE: 0.12 Vpp < signal < 1.5 Vpp.

RECEIVE IMPEDANCE: > 5000 ohms.

CARRIER DETECT LEVEL: signal > 0.12 Vpp, CD asserted.
signal < 0.08 Vpp, CD not asserted.

TRANSMIT AMPLITUDE: 200 Ω load - 0.43 Vpp < signal < 0.49 Vpp.
500 Ω load - 1.1 Vpp < signal < 1.2 Vpp.

DEVICE TYPE: secondary device.

IMPEDANCE LEVEL: high impedance device.

DATA LINK TYPE: HART® primary or secondary.

FIELD MULTI-DROP SUPPORT: option available upon request.

NOTE: the Mux 2700 generally complies with the HART® FSK Physical Layer Specification Rev. 8.0 available from the HART® Communication Foundation. HART® is a registered trademark of the HART® Communication Foundation.

Galvanic Isolation Specifications

24 V SUPPLY/FIELD CHANNELS: 1400 Vac, rms.

24 V SUPPLY /RS-485 SERIAL PORT: 1400 Vac, rms.

RS-485 SERIAL PORT/FIELD CHANNELS: 500 Vac, rms.

Serial Port

LINE TYPE: RS-485, differential pair plus ground.

LINE SPEED: 9600 or 19200 Baud, switch selectable.

LINE TOPOLOGY: multi-point, master-slave connection.

UNIT ADDRESS: 1 to 31, switch selectable.

Selector Port

SW1-SW5: Unit slave address.

SW6-SW7: Baud rate.

SW8: Test mode.

LED Indicators

POWER ON: green.

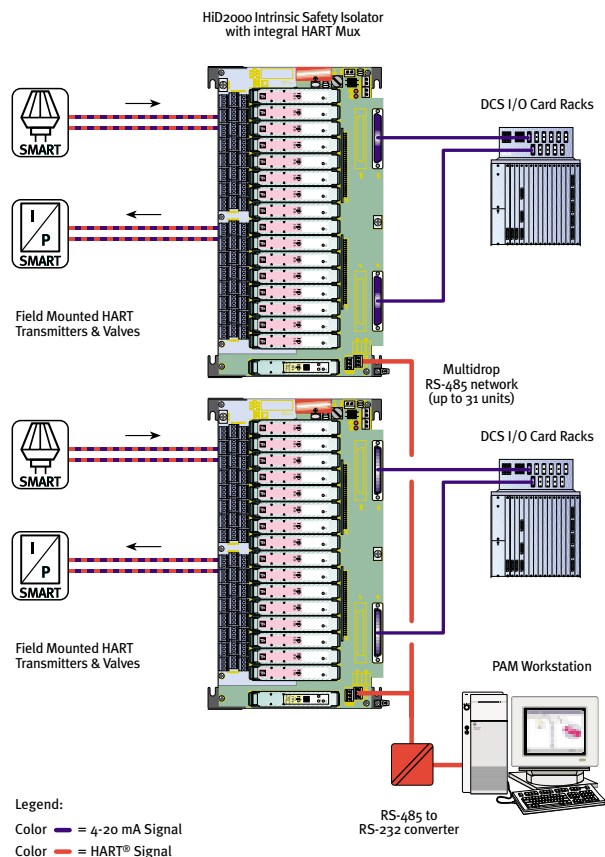
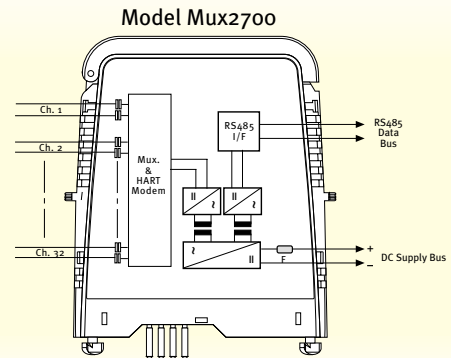
HART® TRANSMISSION: yellow.

FAULT: red.

- 32 channel input.
- RS485 serial data connection.
- Communicate with HART® Transmitters and HART® I/P Valve positioners.
- No complicated master/slave configuration.
- Channel to channel isolation.



SAFE AREA OR HAZARDOUS AREA ZONE 2 (IEC60079-14)



Special Design Features

High Specification Front end Design

Two Decoupling Capacitors are provided, one for each signal connection. Both + Ve (positive) & - Ve (negative) signal wires are therefore decoupled from DC signal. Only the high frequency digital HART® protocol signal passes through to the internal Multiplexer circuitry.

Failure of any one capacitor from either a short circuit or open circuit means that availability of 4-20 mA control signal will not be affected.

- No DC loading of 4-20 mA Control Signal.
- No single point of failure.
- High Noise Immunity.

The max 30 Vdc input voltage (specified between all terminals, both belonging to the same channel or not) makes it possible to connect any MUX terminal to whatever voltage level can be derived from a 24 Vdc supply, +20% tolerance included.

Three-Port Isolation

The three-port isolation structure of the MUX2700 is depicted in the previous page. As you can see, both the 24 V supply input and the RS-485 serial interface are isolated from the HART® section, i.e. from the HART® signals on the field devices.

This is full galvanic isolation, implemented either by transformer or by optocoupler.

Self Contained Architecture

Each Multiplexer module is a stand alone device containing all necessary hardware to communicate with up to 32 HART® protocol enabled Field Devices and a host PC via RS485.

- Fast Polling.
- One module design.
- RS485 direct from module.
- No communications bottleneck.
- Ideal for valve diagnostics.

Wide Software Compatibility

Fully compatible with F-R AMS (Ver 5.0 is also an OPC server), ValveLink and Cornerstone.

Additional compatibility extends to HART® OPC server software available from HCF (HART® Communication Foundation). Allowing users to write dedicated applications for their specific needs.

Fully tested, by all key PAM vendors.

Mux2700 Mounting Options

HiD2000 with Integrated HART® Mux2700

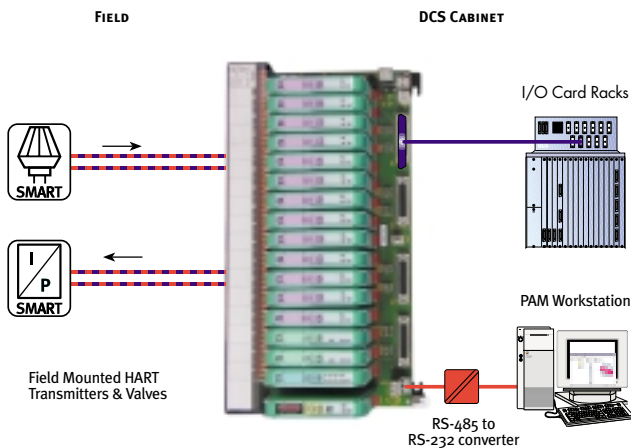
- Fully integrated Intrinsic Safety and HART® Mux.
- Replaces DCS, ESD or PLC field Termination panels.
- Total integrated solution with minimal interconnections.

Termination boards with 2116/.../.../-HART in the model number identifies that this board includes a position to mount an integral Mux2700.

HiD2000 with Remote HART® Mux2700

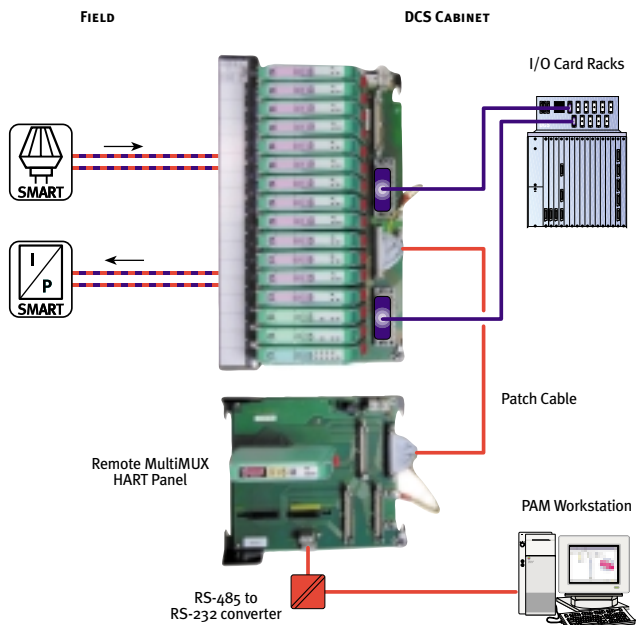
- Retro-fit existing installations by adding a remote HART® Panel.
- Use when the termination board height is critical, as the HART® panel can be mounted in another location.

Termination boards with 2116/.../.../-H in the model number identifies that this board includes a HART patch cable connector to plug to a remote HART® panel.



Legend:

Color — = 4-20 mA Signal
Color — = HART® Signal



General Specification

A range of plug-in isolator modules with intrinsically safe connections for hazardous-area signals and standard connections for general purpose signals, mounting on termination boards with screw-clamp or multi-way safe-area connectors.

Reference conditions

TEMPERATURE: 23 °C (74 °F).

RELATIVE HUMIDITY: 50%.

NOMINAL SUPPLY VOLTAGE: 24 Vdc.

LOAD WHERE APPLICABLE: 250 Ω.

FULL SCALE VALUE: 20 mA.

Power supply (module)

24 V dc -15%, +25%, (20.4 V to 30 Vdc).

Modules individually fused.

Termination boards have redundant power connections with fuse suitable for customer replacement.

Environmental conditions limits

OPERATING TEMPERATURE: 0 to 60 °C, (32 to 140 °F).

STORAGE TEMPERATURE: -20 to 70 °C, (-4 to 158 °F).

RELATIVE HUMIDITY: 5 to 90% non condensing, up to 35 °C (95 °F).

Isolation

1500 VRMS - Field side to control side.

500 VRMS - Field side to field side channels.

250 VRMS - Control side input - output circuits to supply circuit (where applicable).

Location

Safe area mounting.

Electromagnetic Compatibility

Conform to EU standard EN 61326.



Mounting

Terminal boards are surface fixing with option for single DIN rail by the use of accessories. Modules plug-in, no tools required for replacement.

MODULES: See detailed specification. HiD2000 Common to all relevant modules is the provision of a separate fault output which is bussed on the termination boards to provide a collective alarm signal per interface assembly.

TERMINAL BOARDS: See detailed specification. Standard range comprises 8, 12 and 16 position boards in both screw-clamp and multi-connector forms, with cross-wiring and loop-disconnect options.

PROTECTION CLASS: IP rating (IEC 529).

Module: IP 30. Board: IP 20 with module inserted.

WEIGHT: Module approximately 140 gms.

TB 2108 approximately 1000 gms.

TB 2108 CW approximately 1050 gms.

TB 2112 approximately 1300 gms.

TB 2116 approximately 1600 gms.

TB 2116 CW approximately 2000 gms.

CASE MATERIAL: Polycarbonate.

CASE FIRE PROTECTION CLASS: V2 according to UL 94 Std. (When not otherwise stated, modules specifications are typical at reference conditions).

Ordering Information

Series HiD2000 Isolator modules and termination boards are available with standard factory settings (as detailed in this brochure)

Model No. Example:

HiD2026: dual channel repeater power supply module.

2116/HAKE/SACON-HART: 16 position terminal board with terminals for hazardous and connector for safe area.

2116 = 21 series number - **16** I/O module positions.






HAKE = Hazardous **A**rea **K**nife **E**dge terminals with integral test jacks.

SACON = Safe **A**rea **C**ONnector, 37 pin female sub-D connector.

HART = Position for mounting optional Mux2700 **HART**® Multiplexer.

A custom configuration and calibration service can be provided for an additional charge - contact your local Pepperl+Fuchs representative.

Approvals

AUTHORITY	CERTIFICATE/ FILE NO.	STANDARD	MARKING
 CESI	02 ATEX 086	EN 50.020 EN 50.014 EN 50284	II (1) G [EEx ia] IIC/IIB
 CSA	Approved	C 22.2 No. 157 C 22.2 No. 142	Cl. I, II, III; Div 1; Gr.A to G
 FM	Approved	FM Cl. No. 3610 Entity FM Cl. No. 3600	Cl. I, II, III; Div 1; Gr.A to G
SAA SAA	Ex 2389X	AS 2380.1 AS 2380.7	[Ex ia] IIC
 NEPSI	GY198140	GB3836.1-83 GB3836.4-83	Ex (ia) IIC
 CC VE IGD	05.B00272	GOST 12.2.007.0-75 GOST P 51330.10-99	Ex ia IIB X Ex ia IIC X

Specifications are subject to reasonable modification due to technical advances and developments.

Mounting

Surface mounting by front accessible screws (max 6 mm dia.), or clamp directly onto symmetrical 35 mm rail to DIN 46277, EN50022, through DINK kit.

Input (field) terminals:

Screw (../HAT/..) → for I.S. application (blue) compression type, directly accept solid or braided conductors. 9 terminals per position (8 signal + 1 screen), conductor size up to 2.5 mm² (12 AWG).

Suitable for use with all module types.

Loop-disconnect (../HAKE/..) → for I.S. application (blue) compression type, directly accept solid or braided conductors, similar to the Weidmüller SAK Series.

4 terminals per position conductor size up to 2.5 mm² (12 AWG). Nominal current 15 A. Each terminal connection can be “open-circuited” and test-points (for 2.3 mm banana plugs) are integrated into the terminal.

Suitable for use with all 1 and 2 channel modules, except:

- Temperature inputs Mod. HiD2061, HiD2062, HiD2071, HiD2072, HiD2082.
- AI Mod. HiD2029, HiD2029SK, HiD2030, HiD2030SK with sink mA input.
- DO Mod. HiD2871, HiD2872, HiD2875, HiD2876 with LED output.

Output (control room) terminals:

Screw (.././SAT) - compression type, directly accept solid or braided conductors.

9 terminals per position (8 signal + 1 screen), conductor size up to 2.5 mm² (12 AWG).

Suitable for use with all module types.

Connector (.././SACON) - 37 pin D-type connector DIN 41652, female terminals, one for each 4 positions on non-CW boards, one for each 8 positions on CW boards.

Suitable for use with all module types.

Cross-wiring

(.././SACW.+) - insulation displacement type for solid conductors from 0.4 to 0.65 mm (26 to 22 AWG), accept 2 wires max per terminal.

One 4 wire block per module position with 2 wires for each channel.

Cross-wiring area cover carries marking strip and forms effective cable raceway.

Suitable for use with all 1 and 2 channel modules.

- (HiD2871, HiD2872, HiD2875, HiD2876, HiD2881, HiD2962 Bus-Powered only).
- (HiD2942 first output of each channel only).

Screen Connections

In addition to screen terminals provided at each module position where appropriate, one 4 mm² (10 AWG) terminal is provided on both hazardous (field input) and safe (output) parts of the board. Two 4 mm² terminals are provided on loop-disconnect boards.

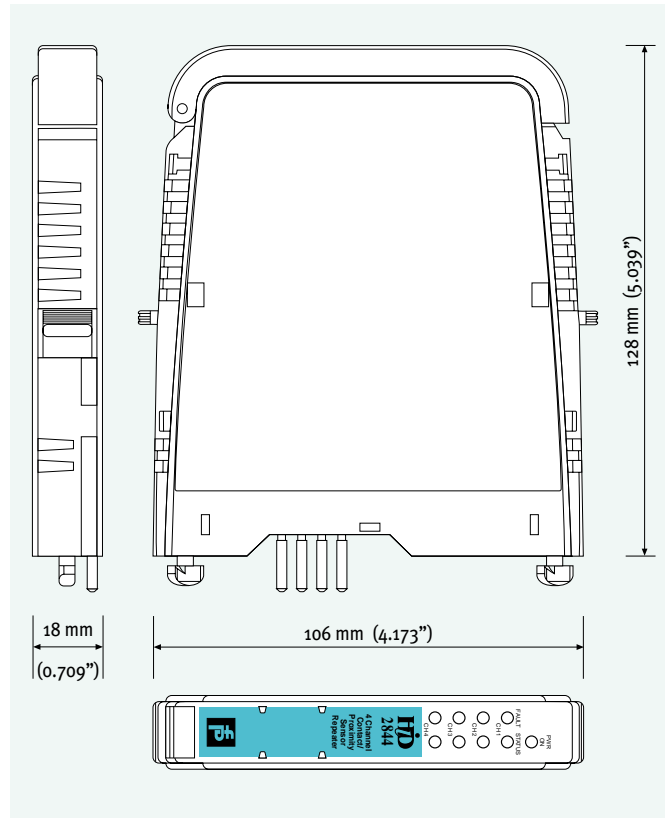
Power Supply

24 vdc, -15% +25%, with plug-in connectors, dual input with diode separation. Connectors accept conductors up to 2.5 mm² (12 AWG). Primary and secondary power supplies can be connected and green LED indicates power on the board.

Fuse Rating

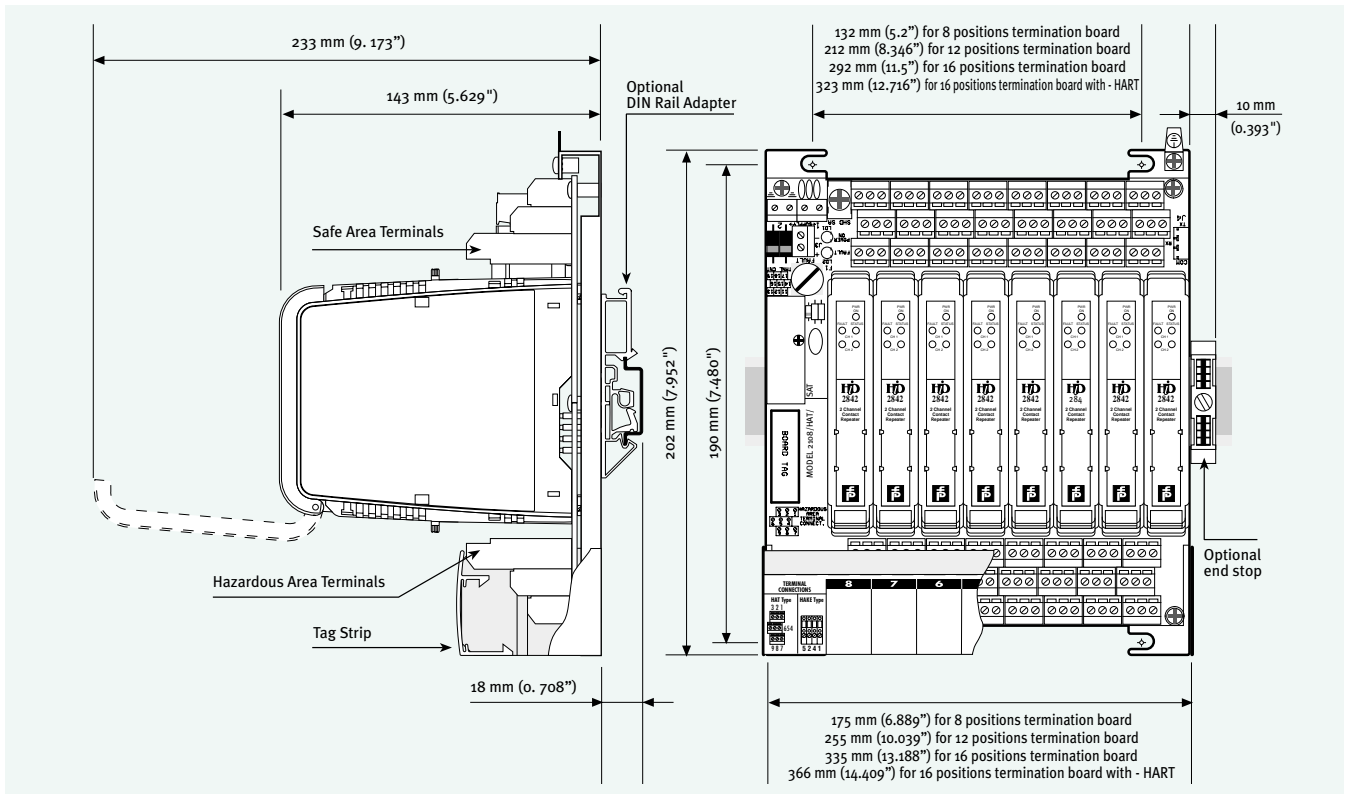
- TB type 2108, power supply fuse 2 Amp (T).
- TB type 2116, power supply fuse 4 Amp (T).
- TB type 2112, power supply fuse 3.15 Amp (T).

Module Dimensional Drawing

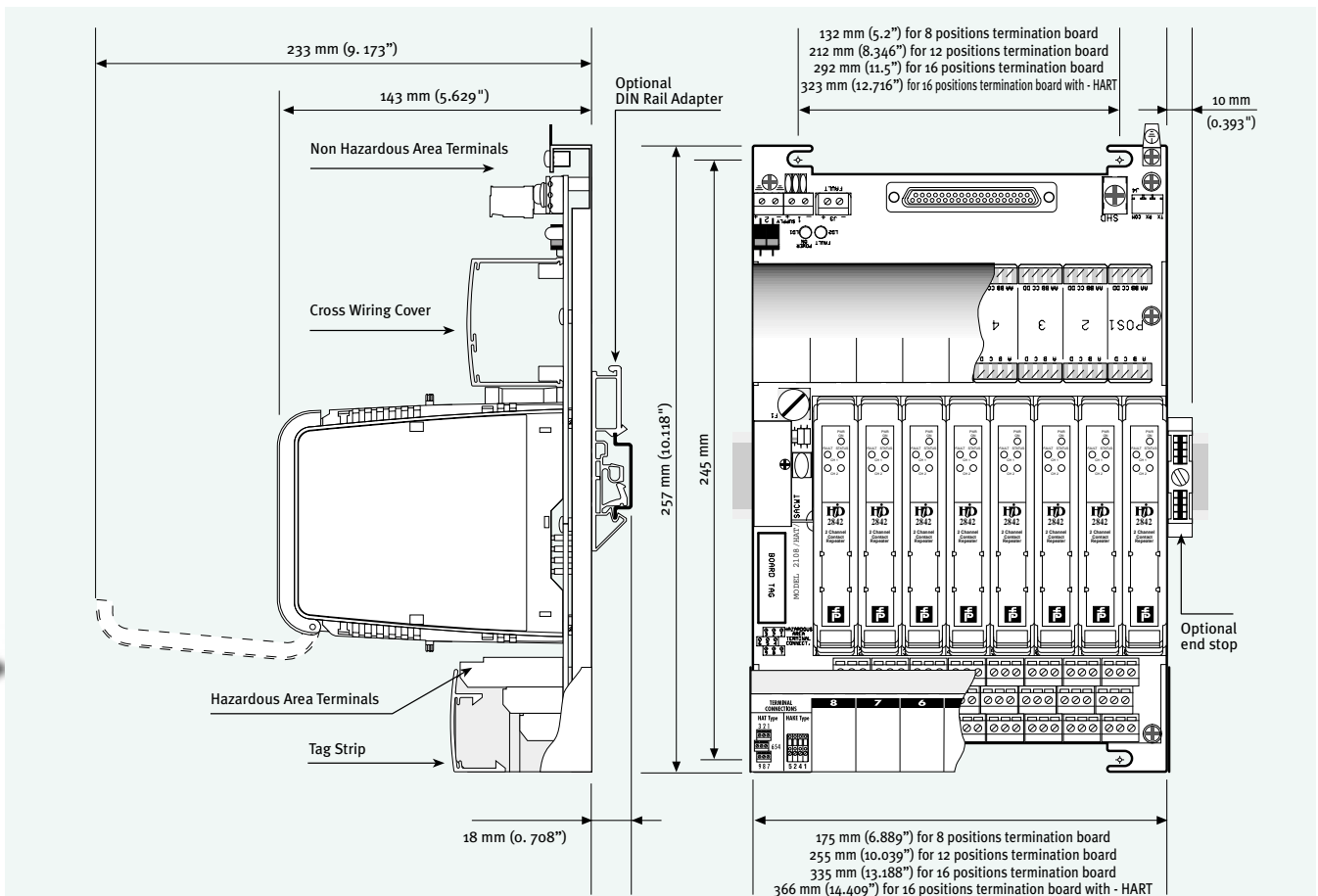


TERMINATION BOARD DIMENSIONAL DRAWINGS

Standard Non Cross-Wiring Type



Cross-Wiring Type



NOTE: when the DIN rail adapter is used to mount the board, add 18 mm to the overall depth. When using the rail end stop add 10 mm to the overall board dimension.

Termination Boards

Base Model	Hazardous Area Options	Safe Area Options	Description	Suitable For Module Type
2108			8 position terminal board	ALL
2116			16 position terminal board	ALL
	/HAT		Hazardous-area (blue) screw-clamp terminals	ALL
	/HAKE		Hazardous-area (blue) loop-disconnect terminals	1-2 Ch. not Temperature IN
		/SAT	Safe-area screw-clamp terminals	ALL
		/SACON	Safe-area multipole connector	ALL
		/SACWT	Safe-area cross-wiring, screw-clamp terminals	1-2 Ch. not 2871/2/5/6
		/SACWCON	Safe-area cross-wiring, multipole connector	1-2 Ch. not 2871/2/5/6

- Standard 8 position and 16 position Termination Boards, with or without the cross-wiring feature.
- Any HiD2000 interface module can be plugged into any position and module types can be mixed on a single termination board.
- Termination Board with -HART® includes a position to mount the Mux2700 HART® Multiplexer. -H includes a connector for remote mounting HART® Multiplexer.
- Optional Fault Monitor Module (MM2100) can be plugged into standard termination boards to provide composite logic output for fault signals from suitable interface modules.

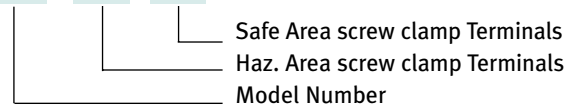
All termination boards are supplied standard with a rugged metal chassis (that can be grounded by a dedicated stud) which provide support and protection for the boards. This rigid structure allows fast and reliable mounting of the assembly within cabinets. Also included is a field wiring tagging strip and terminal cover.

Custom Termination Boards

Replace control system termination panels, by interfacing your DCS, shutdown, fire & gas and PLC system I/O cards direct to a customized HiD2000 termination board, using the standard cable sets from the control system supplier. Refer to the individual T.P.S. (Technical Products Specification) or our Website for specific details.

Typical Example

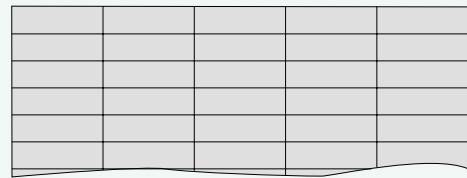
2116 / HAT / SAT



Part Code

Part	Description
MM2100	Fault monitor output module.
DINK1	DIN-rail mounting kit for the 2116 and 2112 termination boards.
DINK8	DIN-rail mounting kit for the 2108 termination boards.
HiD BLANK	Blank module, non-functional.
TAG2108	Tagging strip for 8 position termination board.
TAG2112	Tagging strip for 12 position termination board.
TAG2116	Tagging strip for 16 position termination board.
1301/PZ	Cross Wiring Tool.
1303/CA	Cross Wiring Wire.
PPP2000	Polarization plastic pins.
TSHT2000	Sheet of perforated tagging labels, for HiD2000 modules in DIN A4 format (92 tag each).

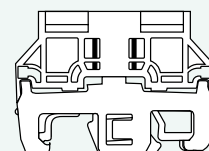
TSHT/2000



1301/PZ



DINK1 and DINK8



1 x Rail end Stop



4 x M3 Screws
(2 x M3 Screws for the DINK8)



2 x Rail Adapter

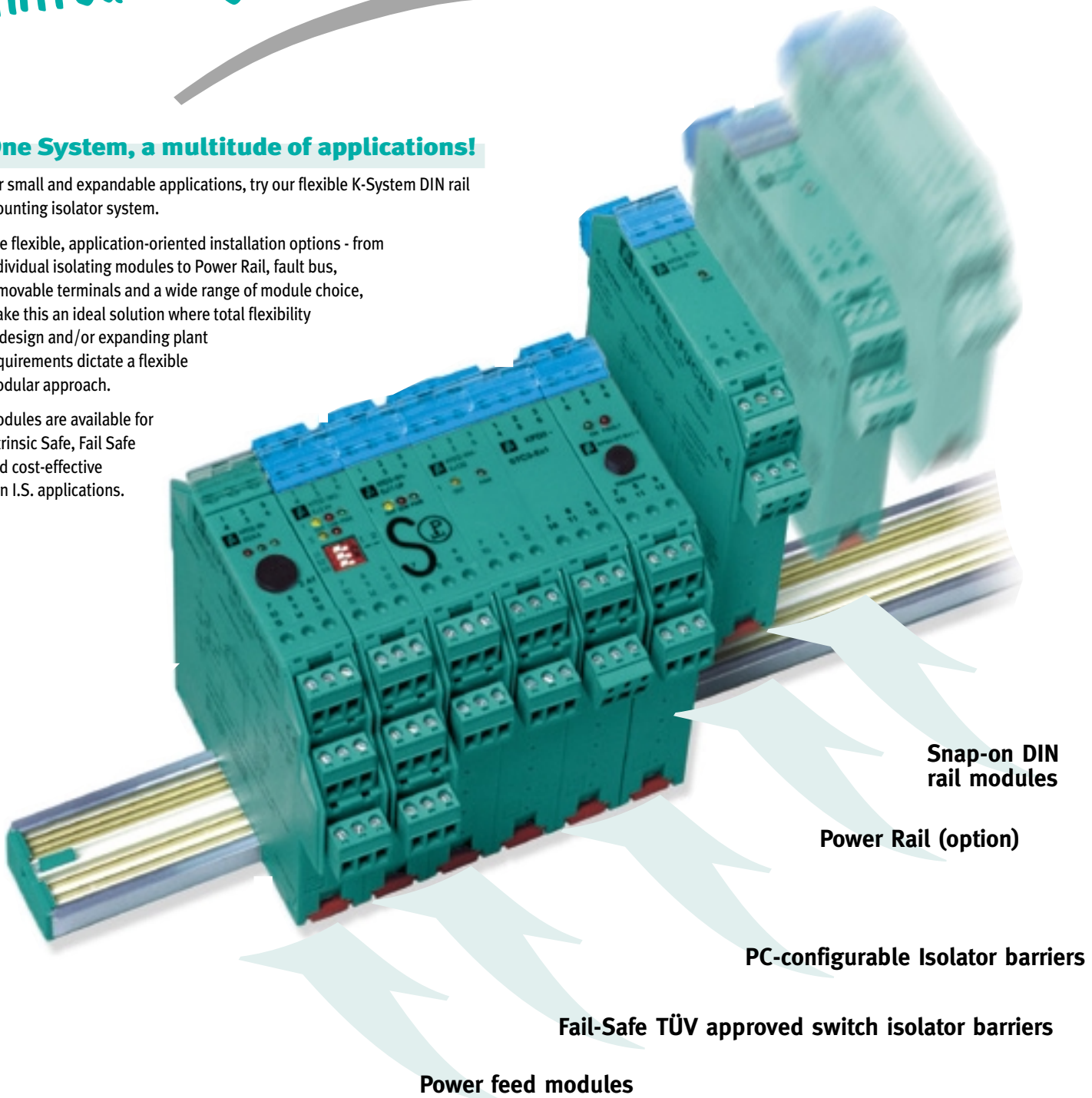
Introducing our K-System

One System, a multitude of applications!

For small and expandable applications, try our flexible K-System DIN rail mounting isolator system.

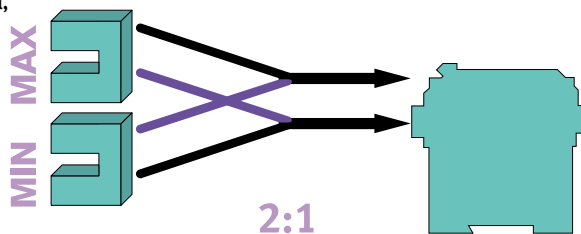
The flexible, application-oriented installation options - from individual isolating modules to Power Rail, fault bus, removable terminals and a wide range of module choice, make this an ideal solution where total flexibility in design and/or expanding plant requirements dictate a flexible modular approach.

Modules are available for Intrinsic Safe, Fail Safe and cost-effective non I.S. applications.



Minimal field cabling:

Up to 30% less cabling due to the transfer of the binary signals via one cable. The patented 2:1 technique is ideal, for Min/Max manometers, valve end position signals, etc.



Need More Information?

Visit us at www.pepperl-fuchs.com or ask for a complete Interface DIN-Rail Housing Catalog.

Power Rail

The Power Rail is simply inserted in the standard DIN EN 50022 rail. The rail then distributes power and fault signals to all modules which snap onto the rail.



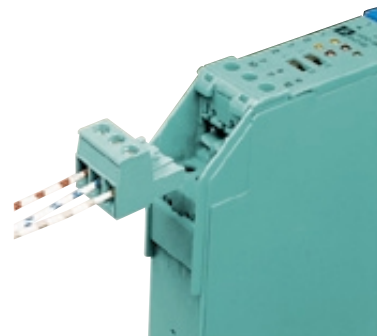
Power Distribution

Use one or two (redundancy) Power Module feeds to distribute power to all modules and output the fault bus signal when sent by modules plugged onto the Power Rail. The Power Feed Modules feature a 4 Amp fuse and an internal alarm is signalled to indicate a defective fuses or power fault.



Removable Terminals

The removable terminals permit rapid connection or replacement of modules, as all wiring remains connected to the terminals. All connectors are coded to avoid incorrect connections.



KF Profile

Use the special custom Aluminum KF Profile to maximise your cabinet space and guarantee cable segregation.



Features

High Integrity Power Supply System.

High Integrity 19" rack mounting system with dual line redundancy. Integral fans ensures cool operating temperatures while providing a complete fault tolerant operation for Power Module or Line failures.



- Up to 36 Amps total or 30 Amps at 24 Vdc with full redundancy.
- Up to two (1550/LM) Line Monitoring Modules can accept independent supply lines for full redundancy.
- 19" rack for panel or surface mounting houses up to 2 Line Modules and 6 Power Modules.
- Each compact (1550/PM) Power Module is rated at 6 Amps at 24 Vdc.
- Plug-in flexibility to add Power Modules for n+1 to 5 redundancy.
- Alarm bus provides output contacts for up to 10 different integral alarm signals.
- Integral fan rack, with fault alarm, maintains a constant cooling efficiency.
- Power Modules self test for short circuits every 10 seconds.
- Automatic Power Module Load Sharing ensures that all modules operate at the same shared output load.
- Hot Swappable modules for live on-line replacement, provides a very low MTTR (Mean Time To Repair).
- No rear access required, all AC & DC wiring connections are made from the front.
- Short Circuit protection is ensured by internal current limiting.
- Overvoltage protection is ensured by automatic Power Module shutdown.
- Front Panel LED alarm status indication for all modules

High Output With Full Redundancy

- Maximum output of 36 Amps at 24 Vdc nominal per rack using six 1550/PM Power Modules.
- Fully redundant configuration provides 30 Amps at 24Vdc, with n+1 (1550/PM) Power Module and two (1550/LM) Line Module failure strategy.
- With a fully redundant strategy the system is tolerant to the loss of 1 Supply Line and 1 Line Module or one or more Power Modules.
- Load sharing across all Power Modules ensures that the load is supplied evenly on failure of a Power Module with automatic adjustment to the present load.
- Mixed AC/DC input capability permits battery back-up without the need for a UPS.
- Unlike current fold back designs the PS 1550 supplies full output (60 Amps total) in a short circuit, instantly clearing a faulty fuse to avoid voltage spikes affecting other units on the same supply bus.

- Fault tolerant.
- High integrity.
- Modular n + 1 redundancy.
- High Power.
- Self monitoring.

Self Monitoring

- Under permanent (> 10 sec.) overload, the output is automatically disconnected to prevent a cable fire. A short pulse transmitted every 10 seconds will restart the output automatically when the fault is removed, to avoid on-site manual restart procedures.

Integral Alarm Monitoring

- All critical functions are automatically monitored and indicated by LED's and relay outputs.
- Output integrity is maintained even in the event of loss of:
 - Supply line.
 - Line Module.
 - Power Module.
 - Cooling fan module.
- Alarm monitoring provides a contact output for:
 - Low voltage on supply lines.
 - Low voltage on output bus.
 - Power Module overload, with LED indication.
 - Power Module low output.
 - Power Module internal fault.
 - Power Module temperature limit protection, to prevent destructive failures.
 - Failure of one of the three integral fans, LED's indicate which fan has failed.
 - Two relay outputs are provided for users to set and/or alarm functions.

Hot Swappable Plug-in Modules

- Modular load sharing design including "Hot Swappable" modules with self detection and signalling of faults, minimizes servicing and maximises MTTR (Mean Time To Repair).
- Easy upgraded while on-line, by plugging in extra Power Modules.



PS 1550 - TERMINATIONS OPTION & BLOCK DIAGRAM

Standard INPUT & OUTPUT Terminations

- Supplied plug-in terminations.



1550/TB-IN

1550/TB-OUT

Output Termination Options

- Additional plug-in output termination options to suit every application.



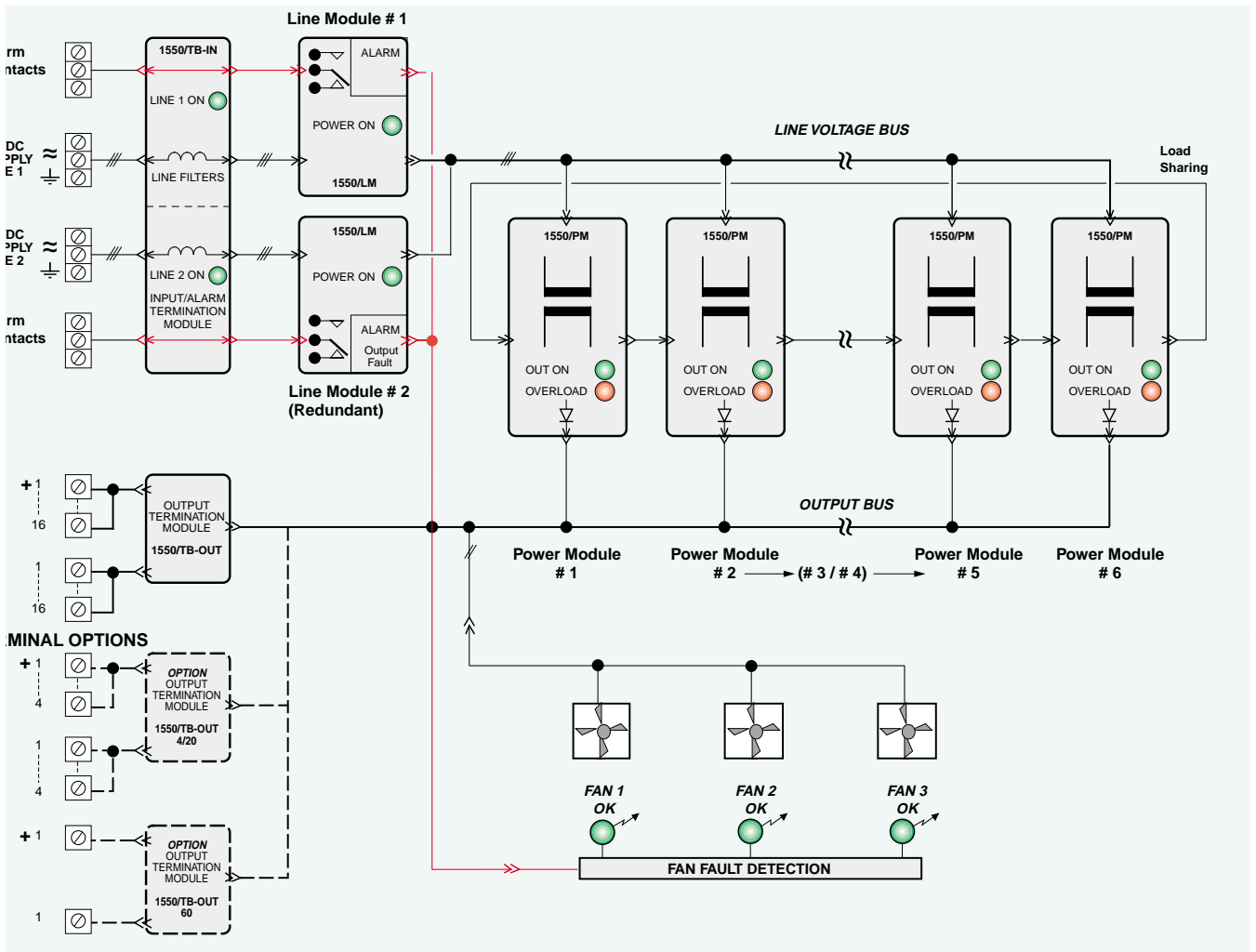
1550/TB-OUT 4/20

1550/TB-OUT 60

- **1550/TB-IN AC** input termination card, for dual independently isolated power inputs and alarm outputs.
- **1550/TB-OUT** output termination card with 16 pairs of 2.5mm², 4 Amp rated terminals.

- **1550/TB-OUT 4/20** Optional output termination card, with 4 pairs of 6 mm², 20 Amp rated terminals.
- **1550/TB-OUT 60** Optional output termination card, provides 1 pair of 60 Amp rated terminals.

Block Diagram



PS 1550 TECHNICAL SPECIFICATIONS

Input

Input line voltage (LINE 1 and/or LINE 2):

AC : 115 Vrms nominal $\pm 15\%$ - (97.5 to 132 V) at 44 to 66 Hz
: 230 Vrms nominal $\pm 15\%$ - (195 to 264 V) at 44 or 66 Hz

DC : 130 V nominal (110 to 180 V).

Line 1 to Line 2 switching (with two Line Modules):

Automatic, instantaneous in case of power down (semiconductor operated).

IMPORTANT:

When using the PS-1550 with two independent supply lines they must be isolated from each other, (i.e. using a 1:1 isolating transformer) to prevent an interconnection of the lines outside the power supply, through the common connected neutral.

Inrush current limiting:

Peak inrush current limited at 150% of full load peak current for each Line Module (300% with two Line Modules).

Turn-on time: 250 ms nominal.

Steady state input current at full load (42 Amps out):

AC : 115 Vrms - 12 Amps average (36 Amps peak).

AC : 230 Vrms - 6 Amps average (18 Amps peak).

DC : 115 V - 11 Amps.

Line voltage bus under-voltage detection:

SPDT relay actuated below 70% of nominal input voltage.

Power module input under voltage lockout:

at 65% of nominal input voltage.

Internal fuses:

Fast acting 6.3 x 32 mm (1/4" x 1 1/4) 500 V/1500 Amps breaking capacity.

Ratings

Line Module (1550/LM)

AC : 115 V nominal 20 Amps (F1, F2) nominal 16 Amps (F3)

AC : 230 V nominal 10 Amps (F1, F2) nominal 8 Amps (F3)

Power Module (1550/PM)

AC : 115 V nominal 3.2 Amps

AC : 230 V nominal 1.6 Amps

Fans supply fuses: 500 mA (5x20 glass).

Input Terminals:

3 mains terminals per line 10 mm².

Output

OUTPUT VOLTAGE:

24 Vdc $\pm 1\%$ - Adjustable from 22.5 to 28 V on Power Module.

Ripple:

30 mVrms, 100 mV pk to pk.

Temperature Coefficient of output voltage:

$\pm 0.02\%$ per °C max.

Line regulation:

< 200 mV output change for a Vmin to Vmax line change.

Load regulation:

less than 500 mV output change for a Zero to max output load.

Turn-on/Turn-off transient:

Voltage ramps to final value in 250 ms max (No over/ undershoot).

Under voltage alarm:

at 22 V ± 0.5 Volts.

Minimum hold-up time:

70 ms at nominal input voltage and load current.

OUTPUT CURRENT:

6 Amps nominal per Power Module (36 Amps total).

Overload alarm:

8 Amps nominal per Power Module (48 Amps total).

Short circuit limit:

10 Amps nominal per Power Module (60 Amps max). Timed for 10 sec continual short before shutdown.

Short reset/retry cycle:

Cyclically the circuit provides short pulses at 10 Amps per module for supply auto reset. At first short removal (V out ≥ 22 V), the system automatically resets at the next retry cycle.

Output terminals:

• **1550/TB-OUT 32** output terminals with 16 pairs, 2.5 mm² (12 AWG) 4 Amps each.

Option:

• **1550/TB-OUT 4/20** four pairs of screw terminals 6 mm² (10 AWG) 20 Amps each.

• **1550 /TB-OUT 60** one pair output studs 60 Amps each.

General

Isolation:

Output Versus Ground: 500 Vdc.

Line Versus Ground: (Y capacitors removed) 2500 Vrms.

Line Versus Output: (Y capacitors removed) 2500 Vrms.

Storage temperature:

-20 °C to +60 °C.

Operating temperature:

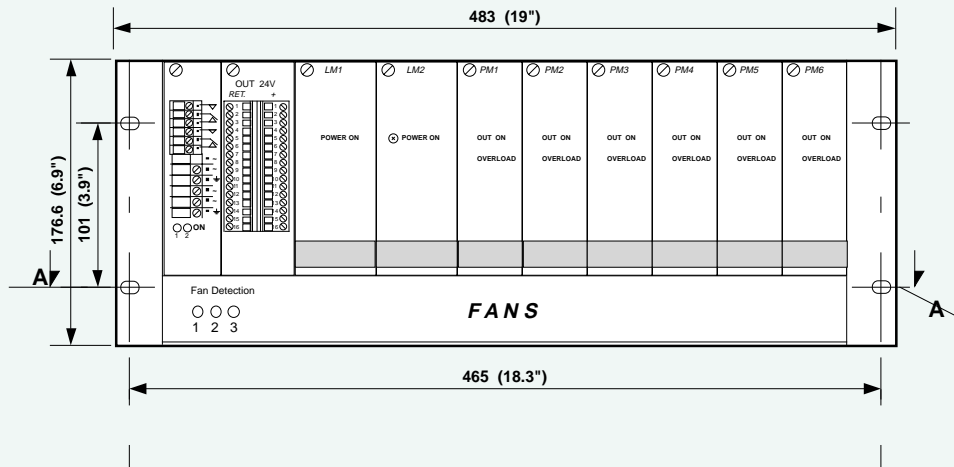
0 to +50 °C.

Conform to EU standard EN 61326.

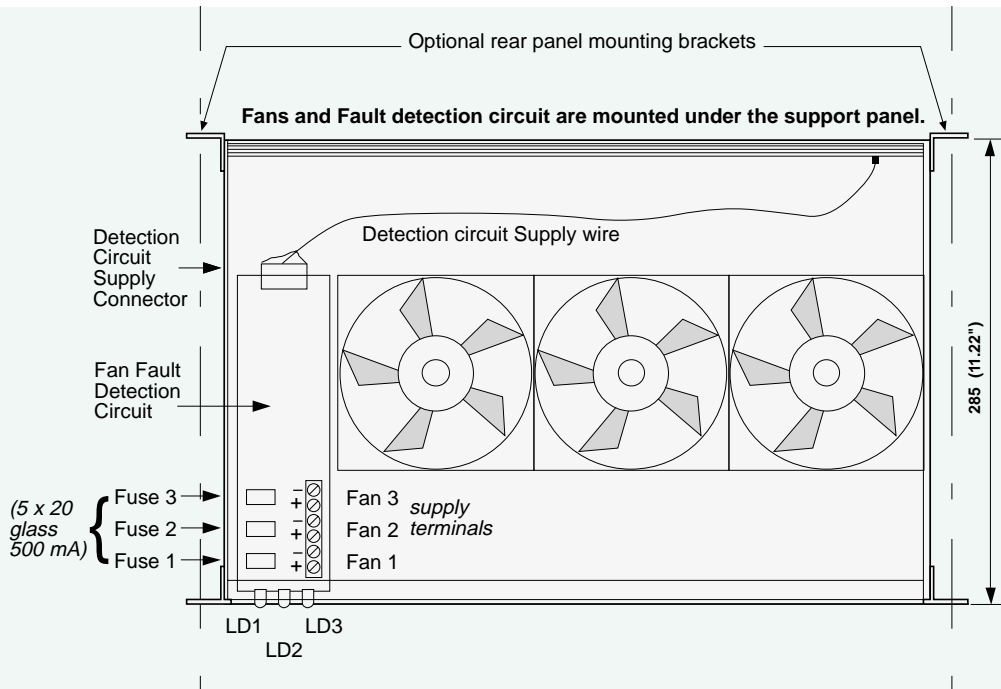
Carries CE mark.

PS 1550 - DIMENSIONS & MOUNTING: mm (INCHES)

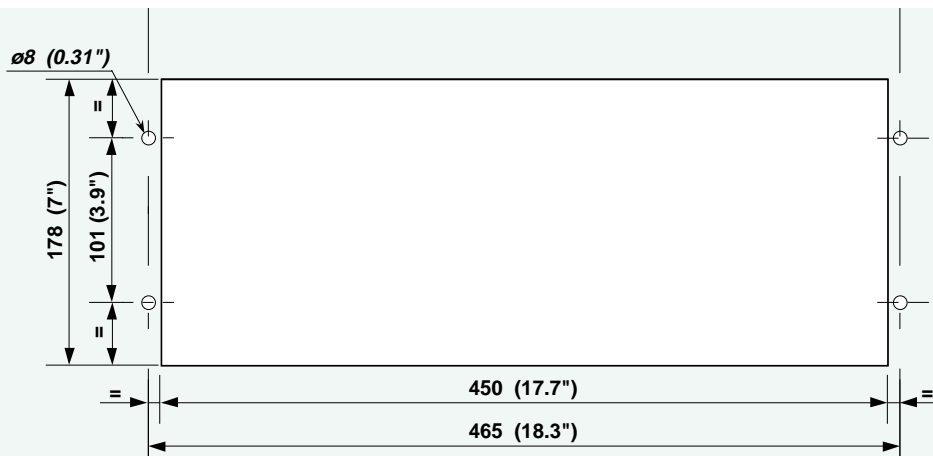
Front View



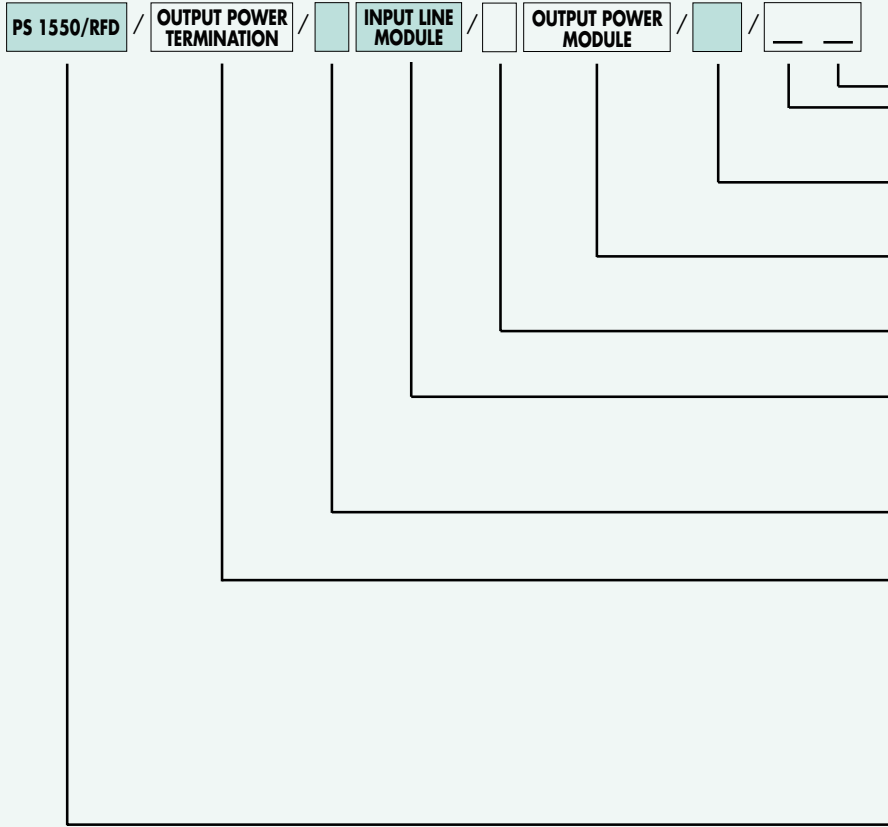
Fan Top View sect. A-A



Cut Out (for front panel mounting)



PS1550 Ordering Information



Blanking Plates:

Quantity for blank output modules
Quantity for blank input modules

RP Rear Mounting brackets

FP Standard 19" Rack mount

Output Module Options (24 Vdc, 6 A each)
1550/PM-115 (for 110-115 Vac/dc Operation)
1550/PM-230 (for 220 - 240 Vac Operation)

Qty. (1 to 6)

Input power conditioning module options

1550/LM-115 (for 115±15% Vac/dc operat.)

1550/LM-230 (for 230±15% Vac operation)

If using two modules they must be the same.

Qty. (1 or 2)

24 Vdc Output Termination Options:

1550/TB-OUT

16 pairs screw terminals

2.5 mm² (12 AWG) 4 A each

1550/TB-OUT 4/20

4 pairs screw terminals

6 mm² (10 AWG) 20 A each

1550/TB-OUT 60

1 pair heavy duty stud 60 Amps each

19" Rack 4U high including supply
input/alarm termination and fans

Example Code: PS 1550 RFD / TB-OUT 60 / 2x1550 LM-115 / 5x1550 PM-115 / FP / 01

24 Vdc 30 A Power supply system including fans, 60 Amp output studs, 2 only 1550/LM line modules 115 V, 5 only 1550/PM Power Modules (24 Vdc 6A each), standard 19" rack mounting, with no input blanking plates and 1 output blanking plate.

KFA6-STR-1.24.4

High Output Power Supply.

- Total 4 Amp @ 24 Vdc.
- Universal 230 Vac/115 Vac supply.
- LED indication for output on (green) or flashing (red) for fault
- UL Approved.

DIN-Rail mounting High current output power supply, for powering DIN rail modules and/or field devices.



KFA6-STR-1.24.500

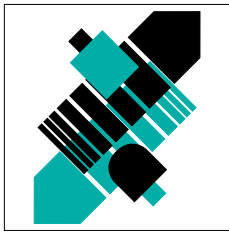
DIN-Rail Power Supply.

- Total 500 mA @ 24 Vdc.
- Universal 230 Vac/115 Vac supply.
- LED indication for output on (green).
- Removable terminals and Power Rail connection.

DIN-Rail mounting power supply, for powering K-Series DIN rail modules and/or field devices.



One Company, Two Divisions.



Factory Automation Division

Product Range

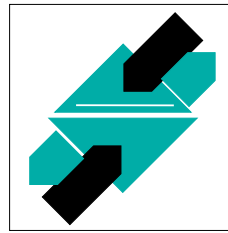
- Binary and analog sensors in different technologies
 - Inductive and capacitive sensors
 - Magnetic sensor
 - Ultrasonic sensors
 - Photoelectric sensors
- Incremental and absolute rotary encoder
- Counters and control equipment
- Identification Systems
- AS-Interface

Areas of Application

- Machine engineering
- Conveyor or transport
- Packaging and bottling
- Automobile industry

Service Area

Worldwide sales, customer service and consultation via competent and reliable Pepperl+Fuchs associates ensure that you can contact us wherever or whenever you need us. We have subsidiaries worldwide for your convenience.



Process Automation Division

Product Range

- Signal conditioners
- Intrinsically safe interface modules
- Remote process interface (RPI)
- Intrinsically safe field bus solutions
- Level control sensor
- HART® Multiplexer
- Process measuring and control systems engineering at the interface level
- Intrinsic safety training

Areas of Application

- Chemical industry
- Industrial and community sewage
- Oil, gas and petrochemical industry
- PLC and process control systems
- Engineering companies for process systems

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