IOP Series

Cost effective surge protection for digital and analogue I/O

MTL SURGE TECHNOLOGIES
A part of COOPER Crouse-Hinds

- **IOP32D provides surge protection for two loops or 4 wires**
- **IOP32 provides surge protection for one loop or 2 wires**
- **IOP HC32 provides surge protection for one high current loop, up to 5A**
- **Removable terminals - easy installaion, easy to test**
- **Hybrid protection circuit - 20kA rated surge current**
- **ATEX certified**
- **Space saving - 6mm width per loop IOP32D - 12mm width per loop IOP32**

The IOP was conceived to offer protection for both digital I/O and **analogue I/O.** The IOP range is the most economical surge protection solution for I/O offered by MTL Surge Technologies. High packing density, high protection level and low price combine to make the IOP a value solution.

The IOP Series is cost effective and still retains a hybrid circuit comprising 20kA gas discharge tubes and solid stage components. This impressive product is designed to exhibit exceptionally low line resistance and therefore adds only a tiny voltage drop to the circuit.

Removable terminals are used on the IOP Series for ease of installation, maintenance and for providing a loop disconnect by simply unplugging the terminals from the side of the module. Wire entry is angled to assist wiring within limited space enclosures.

The IOP HC32 is ideal for applications requiring up to 5A of load current. Protection of circuits to drive solenoids, relays, and actuators is now possible.

Fully automatic in operation, IOP devices react immediately to make sure that equipment is never exposed to damaging surges between lines or the lines and ground. Reacting instantaneously, the IOP redirects surges safely to ground and then resets automatically.

The versatile design minimizes space. The IOP32D has protection for two loops in a package that is only 0.48" wide. The effective space taken up per loop is only 0.24". For customers desiring single channel integrity, the IOP32 fits this need exactly.

One simple manual operation clamps modules securely onto DIN rail, which automatically provides the essential high-integrity ground connection.

A 10 Year 'No Fuss' warranty is available as standard for the IOP so if a correctly connected device should fail for any reason, simply return it for a free replacement.

'Top-hat' (T-section) DIN rail is generally suitable for mounting IOP modules although for adverse environments, a specially-plated version is available from MTL Surge Technologies.

Data & Signal Protection

Specification

All figures typical at 77°F (25°C) unless otherwise stated

Maximum surge current
20kA (8/20µs waveform) per line
Leakage Current
<1µA @ working voltage
Maximum rated load current
0.675A (5A for IOP HC32)
Loop resistance
4 Ohm (0 Ohm for IOP HC32)
Bandwidth
6.5 MHz (N/A for IOP HC32)
Attenuation
< - 0.3dB @ < 1MHz
-3.0dB @ 6.5MHz
Response time
<1ns
Ambient temperature
–40°F to +176°F (–40°C to +80°C) working
–40°F to +176°F (–40°C to +80°C) storage
Humidity
5 to 95% RH (non-condensing)
Terminals
2.5mm² (12 AWG)
Electrical connections
Plug/header screw terminal strip
Mounting
T-section DIN-rail (35 x 15mm rail)
Weight
5oz (140g approximately)
Case flammability
UL94-V0
EMC compliance
BS EN 60950:1992
BS EN 61000-6-2:1999
BS EN 61010-1:1993
Electrical safety
See approvals on bottom, right

Model		IOP32	IOP32D	IOP HC32
Nominal voltage	U_n	32V	32V	32V
Rated voltage (MCOV)	U_c	36V	36V	36V
Nominal current	I_n	675mA	675mA	5A
Nominal discharge current (8/20µs)	i_{sn}	3kA	3kA	3kA
Max discharge current (8/20µs)	I_{max}	20kA	20kA	20kA
Lightning impulse current (10/350µs)	I_{imp}	2.5kA	2.5kA	2.5kA
Residual voltage @ i_{sn}	U_p	45V L-L 78 L-G	45V L-L 90V L-G	65VL-L (250V sparkover) 65V L-G
Voltage protection level @ 1kV/µs	U_p	<38V	<38V	<38V
Bandwidth	f_G	6.5MHz	6.5MHz	N/A
Series resistance	R	2	2	0Ω
Operating Temperature Range		-40°C to +80°C		
Category tested		A2, B2, C1, C2, C3, D1		
Overstressed fault mode i_n=3kA		22kA	22kA	22kA
Impulse durability (8/20µs)		10kA	10kA	10kA
Degree of protection		IP20		
AC durability		$1A_{rms}$, 5T		
Service conditions		80kPa-160kP5% - 95% RH		

Tested in accordance to IEC 61643-21.

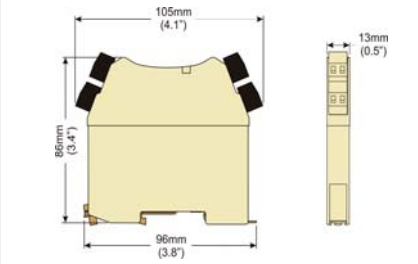

Figure 1 Dimensions

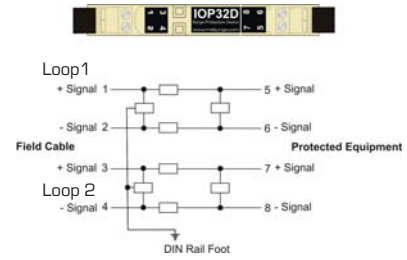

Figure 2 Connection details

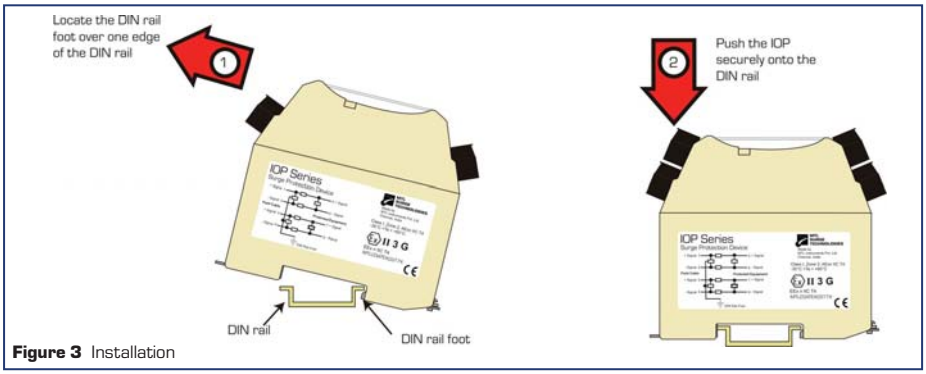

Figure 3 Installation

To order specify -

Order by module, as listed in the specification table.

Note: In accordance with our policy of continuous improvement, we reserve the right to change the product's specification without notice.

Approvals

Country	Standard/Authority	Certificate/ File No.	Approved for	Product
EU (Baseefa)	EN 50014:1997 + A1 & A2 EN 50020:2002 EN60079-26:2004	BaseefaO6ATEX0036X	EEx ia IIC T4	IOP32 IOP32D
EU (MTL)	BS EN 50014:1998 BS EN 50021:1999 EN 60079-15:2003	MTL06ATEX0132X	EEx n IIC T4	IOP32 IOP32D
USA (FM)	Class Nos. 3600 (1998), 3610 (1999), 3611 (1999), 3615 (1989), 3810 incl. Supp 1 (1995-07 (1989-03), ANSI/NEMA 250 (1991), ISA-S12.0.01 (1999)	3011208	Intrinsically Safe: I/1/A-D, I/0/II C Non incendive: I/2/A-D, I/2/II C	IOP32 IOP32D
Canada (FM)	C22.2 No. 213, 142, 94, 157, 30 ANSI/NEMA 250 CAN/CSA-E79-0 CAN/CSA-E79-11	3025374	IS/I/1/ABCD I/0/Ex ia/IIC I/0/Ex ib/IIC NE/I/2/ABCD NE/I/2/IIC	IOP32 IOP32D

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Local sales office information is also available on our web site at:
www.mtlsurge.com/support/distribution/index.htm

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