

9387-FB2, 9388-FB2 6/12-Spur, Open-Frame, Fieldbus barrier

- For Foundation™ fieldbus networks in hazardous areas
- Pre-assembled system components for 6 or 12 intrinsically safe spur connections
- For assembly into user-specified field enclosures
- Spurs compatible with FISCO and "Entity-certified" fieldbus instruments
- Ergonomic mechanical design
- Pluggable system components without "gas free" constraints
- Optional, integrated surge protection for trunk and spurs



The 9387-FB2 (6-spur) and 9388-FB2 (12-spur) Fieldbus Barrier assemblies provide intrinsically safe spur connections from a high-energy trunk, for connection to suitably certified Foundation™ fieldbus H1 instruments. Each unit comprises pre-wired and assembled system components on a stainless steel baseplate, for installation into a suitably certified field enclosure. Connection facilities are provided for the trunk and spur wiring, as well as all electronic modules needed to support a fully-working Fieldbus Barrier. In a typical application, an Ex e (increased safety) certified field enclosure will be selected to allow installation in a Zone 1 hazardous area; third-party approval of the enclosure and contents is normally required. Alternative uses include applications that are not satisfied by the 9370-FB2 range of Fieldbus Barriers in standard enclosures, such as the installation of multiple fieldbus segments inside a single field enclosure.

Each intrinsically safe spur is capable of supporting a FISCO or 'Entity' certified fieldbus device located in a Zone 0 or 1 hazardous area. The short-circuit protected spurs are galvanically isolated from the trunk and require no protective ground connection in the field. The units are bus powered and require no additional power supply in the field. When used with a fieldbus host control system, power for the trunk may be provided by MTL power supplies in redundant or non-redundant format.

The 9387-FB2 and 9388-FB2 share the unique features of Eaton's class-leading 9370-FB range of Fieldbus Barrier system. The key modular components of the system (Fieldbus Barrier, Terminator and Surge Protectors) may be 'hot-plugged' by design and without gas-clearance procedures or separate isolating switches. This virtually eliminates the risk associated with hazardous area maintenance activities, speeds module replacement and avoids the need for specialist operator training. Optional features include pluggable surge protection components for the fieldbus trunk and individual spurs.



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MTL 9380-FB2 range

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SPECIFICATION

SPURS

	9387-FB2	9388-FB2
# of spurs	6	12
# of 9377-FB-R modules installed	1	2
Current per spur	0 - 40mA	0 - 40mA
Total current all spurs (max.)	240mA	480mA
Current limit per spur (max.)		45mA
Spur short circuit current (max.)		4.5mA
Spur voltage @ 20°C		≥ 10V @ 40mA
No-load voltage		12V min.
Number of field devices		1 per spur
Maximum spur length		120m (depending on the number of spurs per fieldbus segment)
Galvanic isolation (to EN 60079-11)		Trunk to spurs: 1.5kV (test voltage)
		Spur to spur: no isolation
		Module to module: 30V
Spur surge protection		Plug-in module (part number FS32) - see separate specification

* See ordering information

TRUNK

Data rate	31.25kBaud
Data transmission between trunk and spurs	passive, no repeater function
Number of trunk connections	2 (in & out), internally connected, spare trunk in
Maximum number of 9377-FB-R modules per segment	3 (total 18 spurs)
Input voltage range (trunk)	16–32V DC
Voltage drop (trunk in to trunk out)	0V
Maximum rated current (trunk in to trunk out)	5A
Low voltage monitoring	Input voltage < 16V, spurs de-energized
DC current consumption for	6 spur (9387-FB2) and 12 spur (9388-FB2) units (mA)

		@ 16V		@ 24V		@ 32V	
		9387	9388	9387	9388	9387	9388
No load on each spur	typ.	35.3	70.6	29.1	58.2	22.3	44.6
	max.	37.0	73.0	30.0	60.0	23.0	46.0
1 spur @ 20mA	typ.	62.4	97.7	44.2	73.3	36.7	59.0
	max.	75.0	150.0	46.0	76.0	53.0	106.0
All spurs @ 20mA	typ.	158.8	317.6	110.3	220.6	86.9	173.8
	max.	164.0	328.0	114.0	228.0	90.0	180.0
All spurs @ 20mA	typ.	146.0	304.3	101.8	212.1	81.0	167.4
	max.	150.0	314.0	105.0	219.0	83.0	173.0
1 short circuit All spurs @ 32mA	typ.	233.9	467.8	158.1	316.2	122.1	244.2
	max.	244.0	487.0	163.0	326.0	126.0	252.0

Power dissipation (max.)	9387-FB2	9388-FB2
All spurs at 32mA	1.8W	3.6W

Fieldbus terminator

Plug-in module (part number F93-XE) supplied with each 937x-FB2 enclosure.
Provides 100Ω + 1μF according to IEC 61158-2 - see separate specification

Trunk surge protection

Plug-in module (part number 9376-SP) - see separate specification

Reverse polarity protection

Yes

ELECTRICAL CONNECTIONS

Trunk wiring terminals

Type: Ex e

Cable types and capacity	Screw cage clamp - mm ²	Spring cage clamp - mm ²
Rigid cable	0.5 to 2.5	0.5 to 2.5
Flexible cable	0.5 to 2.5	0.5 to 2.5

Spur field wiring terminals

Type: 3-way, pluggable

Cable types and capacity	Screw cage clamp - mm ²	Spring cage clamp - mm ²
Rigid cable	0.2 to 2.5	0.2 to 2.5
Flexible cable	0.25 to 2.5	0.25 to 2.5

Grounding of cable screens (trunk & spurs)

(Configured with wire connections in the Trunk Terminal Assembly)

Options	Trunk	Spurs
1 Single point grounding	Grounded at host	Trunk & spur screens joined
2 Local grounding of spurs	Grounded at host	Grounded at field enclosure

Equipotential earth/ground connection facility

M10 earth/grounding stud on baseplate

BARRIER LED INDICATORS

Trunk Power (PWR)

	ON	OFF
Green	Supply voltage > 16V, internal supply healthy	Supply voltage < 16V or no supply

Spurs (tri-colour, per spur)

Colour	Steady	Flashing
Green	Channel powering spur - spur OK	Channel powering spur - spur open
Red	Internal fault	Internal fault
Yellow	Short to shield	Short circuit, current limit
Off	Supply < 16V or no supply	N.A.

MTL 9380-FB2 range

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PHYSICAL NETWORKS

IEC61158-2
FOUNDATION™ fieldbus H1

Profile type (according to FF-816)

Type 163 (isolated device coupler)
Designed to comply with FF-846

HAZARDOUS AREA APPROVALS

Location of equipment

Zone 1 IIC T4 hazardous area when mounted inside a suitably certified Ex e enclosure

Location of connected spur equipment

Zone 0 IIC hazardous area

Certification codes

E II 2(1) G
Ex d e ib mb [ia Ga] IIC T4 Gb (-40°C ≤ Ta ≤ 75°C)

Certificate numbers

Baseefa 14ATEX0111U
IECEx BAS14.0057U
Note: 9387-FB2 and 9388-FB2 are product ordering codes. The certification documents refer to the 937x components that comprise these assemblies.
'U' denotes a unit that requires further equipment for use in hazardous areas, i.e. a suitably certified enclosure.

Safety description (spurs)

U_o = 16.4V
 $I_{o \text{ peak}}$ = 249.5mA
 $I_{o \text{ continuous}}$ = 109mA
 P_o = 898mW
 U_i = 16.4V
 C_i = 0
 L_i = 0

Spurs in accordance with FISCO standard IEC 60079-27

ENVIRONMENTAL

Ambient temperature (inside selected enclosure)

Operating	Storage
-40°C ... +75°C	-40°C ... +75°C

Relative humidity

< 95%, non-condensing

Electromagnetic compatibility

EN 61326-1:2013
NAMUR NE 21

Shock & Vibration

Vibration:
BS EN 60068-2-6: 2008 Test Fc: 1g
BS EN 60068-2-64: 1995 Test Fh: 1g
Shock:
BS EN 60068-2-27: 1993 Test Ea: 15g

MECHANICAL

Mounting position (recommended)

On to a vertical plane. The component must be mounted in an appropriately certified enclosure typically rated to IP66 when used in hazardous areas.

When used in safe areas, the enclosure must provide ingress protection of at least IP20.

Protection

Intrinsically safe terminals IP20
Non-IS terminals IP30

Weights †

MTL Part number	Weight (kg)
9387-FB2	2.7
9388-FB2	4.5

† includes barrier(s) and terminator but excludes any surge protection items

ORDERING INFORMATION

Order as:

9387-FB2-xx 6-spur Fieldbus Barrier system with **one** 6-spur 9377-FB-R module installed.

9388-FB2-xx 12-spur Fieldbus Barrier system with **two** 6-spur 9377-FB-R modules installed.

Where **xx** = PS (pluggable screw terminal connectors) PC (pluggable spring clamp connectors)

(Note: All assemblies are pre-wired and include a F93-XE Fieldbus terminator module)

9377-FB-R Fieldbus Barrier 6-spur, pluggable module

F93-XE Fieldbus terminator

9376-SP Trunk surge protection module

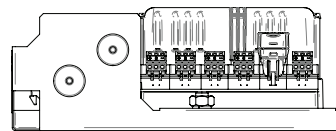
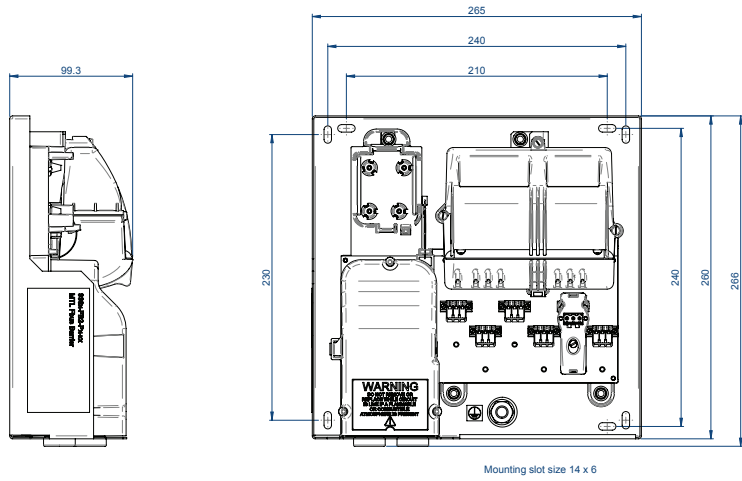
FS32 Spur surge protection module

MTL 9380-FB2 range

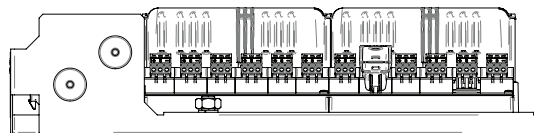
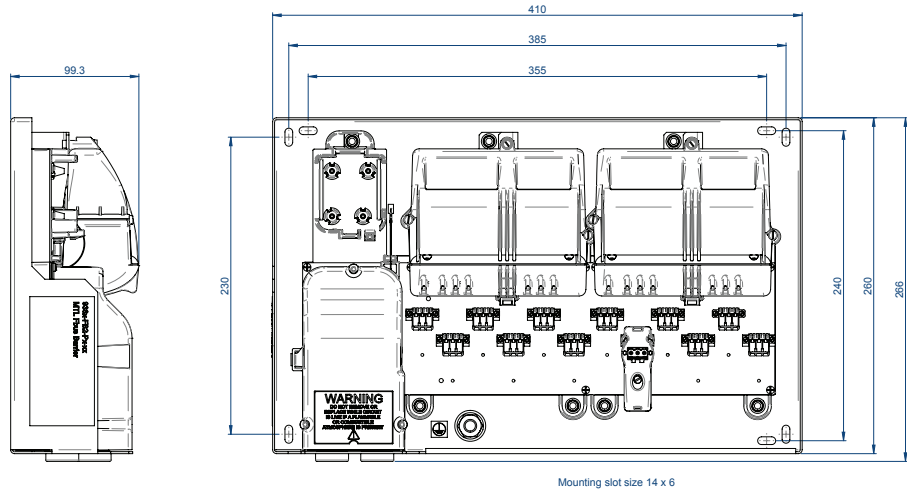
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DIMENSIONS (mm)

9387-FB2-xx
6-way baseplate assembly



9388-FB2-xx
12-way baseplate assembly
(showing two, spur surge protection modules)



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