

937x-FB-Px-SS range

MTL fieldbus barrier, 6 and 12 spur, stainless steel enclosures

- For FOUNDATION™ fieldbus networks in hazardous areas
- Complete enclosure systems for 6 or 12 intrinsically safe spur connections
- Mount in Zone 1 (gas) or 21 (dust) with spurs connected into Zone 0
- Compatible with FISCO and Entity-certified fieldbus instruments
- Compact, modular construction
- Ergonomic mechanical design
- Pluggable system components, without 'gas free' constraints
- Optional, integrated surge protection for trunk and spurs



(Surge protection and cable glands shown are not included as standard)

The 937x-FB Fieldbus Barriers are field-mounted wiring hubs that create up to twelve intrinsically safe spur connections from a high-energy trunk, for connection to suitably certified FOUNDATION™ fieldbus H1 instruments. Capable of supporting heavily loaded fieldbus segments and long trunk cable lengths, 937x-FB barriers may be installed in Zone 1 (gas) or Zone 21 (dust) hazardous areas, with the trunk wiring implemented using suitably protected cable and increased safety (Ex e) connection facilities.

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.

Unlike conventional Fieldbus Barrier products that are based on stand-alone modules, the 937x-FB-Px-SS units are supplied as complete, factory-assembled enclosure systems in stainless steel material that do not require additional wiring, customised housings or complex ancillary components. Electrical and mechanical aspects of the design are integrated, providing the industry's first complete, ergonomic solution for 'High Energy Trunk' applications in hazardous areas combined with an enclosure 'footprint' up to 40% smaller than existing implementations.

Uniquely, 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. Connection facilities with generous room for cable management are provided within the Fieldbus Barrier enclosure for the trunk and spur wiring. Where appropriate, the trunk wiring may be extended from one Fieldbus Barrier enclosure to another.

For added flexibility, a 12-way enclosure can be specified part-populated with 6-spurs (model no. 9374-FB). This permits future expansion from six to twelve spurs simply by plugging in an additional Fieldbus Barrier module.

The 937x-FB Fieldbus Barrier is bus-powered and requires no additional power supply in the field. When used with a fieldbus host control system, power for the trunk may be provided by MTL-Relcom power supplies in redundant or non-redundant format.

937x-FB-Px-SS

December 2015

SPECIFICATION

SPURS

	9371-FB	9373-FB	9374-FB* (expandable)
No. of spurs	6	12	6 (+6)
No. of 9377-FB-R modules installed	1	2	1 (+1)
Current per spur	0 - 32mA	0 - 32mA	0 - 32mA
Total current all spurs (max.)	192mA	384mA	192 (+192)mA
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

31.25kBaund

Data transmission between trunk and spurs

passive, no repeater function

Number of trunk connections

2 (in & out), internally connected

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 (9371-FB) and 12 spur (9373-FB) units (mA)

		@ 16V		@ 24V		@ 32V	
		9371	9373	9371	9373	9371	9373
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 1 short circuit	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
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.)	9371-FB	9373-FB	9374-FB
All spurs at 32mA	1.8W	3.6W	1.8 (+1.8)W

Fieldbus terminator

Plug-in module (part number 9378-FT) supplied with each 937x-FB 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 4.0	0.5 to 4.0
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

Trunk and spur cable shields are not interconnected within 9377-FB-R module itself.

Equipotential earth/ground connection facility

M10 earth/grounding stud on side wall of enclosure

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	N.A.
Yellow	Short to shield	Short circuit or current limit
Off	Supply < 16V or no supply	N.A.

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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

Safe area or Zone 1 IIC T4 or Zone 21 hazardous area

Location of connected spur equipment

Safe area or Zone 0 IIC hazardous area

Certification codes

Ex II 2(1) GD
Ex de ib mb [ia Ga] IIC T4 Gb
Ex tb IIIC T80°C Db

Certificate numbers

Baseefa 09 ATEX0185X
IECEX BAS09.0082X

Safety description (spurs)

U_o = 17.5V
 $I_{o\ peak}$ = 249.5mA
 $I_{o\ continuous}$ = 113mA
 P_o = 982mW
 U_i = 17.5V
 C_i = 0
 L_i = 0

Spurs in accordance with FISCO specification

ENVIRONMENTAL

Ambient temperature (system)

Operation	Storage
-40°C ... +70°C	-40°C ... +75°C

Ambient temperature (9377-FB-R module)

-40°C ... +75°C

Relative humidity

< 95%, non-condensing

Electromagnetic compatibility

EN 61326-1:2006
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

Enclosure Materials

316L Stainless Steel

Mounting position (recommended)

On vertical plane, with glands and breather on underside

Cable/Breather entries

Trunk: 2 x M20
Spurs: 6 or 12 (depending on model) x M20
Breather: 1 x M20

Enclosures are pre-fitted with an Ex e nickel-plated breather and Ex e nickel-plated brass plugs in all cable gland holes. The gland plugs must be replaced only with Ex e equipment certified cable glands capable of maintaining the IP level of the enclosure type. See ordering information for gland options.

Ingress Protection

Stainless steel enclosures (937x-FB-xx-SS): IP65
Intrinsically safe terminals: IP20
Ex e terminals: IP30

Enclosure sizes - see dimension drawings for details

Stainless steel, 6 spurs 291 x 271 x 130mm
Stainless steel, 12 spurs 428 x 271 x 130mm

Enclosure Weights †

Part number	Weight (kg)
9371-FB-xx-SS	5.79
9373-FB-xx-SS	8.43
9374-FB-xx-SS	7.48

† excludes any cable glands or surge protection items

ORDERING INFORMATION

Order as:

9371-FB-xx-SS	6-spur Fieldbus Barrier enclosure system with one 6-spur 9377-FB-R module installed.
9373-FB-xx-SS	12-spur Fieldbus Barrier enclosure system with two 6-spur 9377-FB-R modules installed.
9374-FB-xx-SS	12-spur Fieldbus Barrier enclosure system with one 6-spur 9377-FB-R module installed. (Expandable to 12-spur by addition of a second 9377-FB module)

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

(Note: All enclosures are pre-wired and include a 9378-FT Fieldbus terminator module)

9377-FB-R	Fieldbus Barrier 6-spur, pluggable module
9378-FT	Fieldbus terminator
9376-SP	Trunk surge protection module
FS32	Spur surge protection module

CABLE GLANDS

The following M20 cable glands are Ex e equipment certified, better than IP66 rated and suitable for use with the 9370-FB Fieldbus Barriers. They can be supplied separately and are available to order individually using the following part numbers.

Order No.	Manufacturer and Type	Description (Qty 1)
FCS-1000-P20	Jacob 50.620 PASWL/Ex	Plastic gland
FCS-1000-C20	Capri 816694	Nickel-plated brass gland
FCS-1000-A20	Capri 846694	Armoured nickel-plated brass gland
FCS-1000-S20	Capri 816699	Stainless steel gland
FCS-1000-R20	Capri 846699	Armoured stainless steel gland

ASSOCIATED LITERATURE

Instruction Manual - stainless steel enclosures **INM937x-SS**

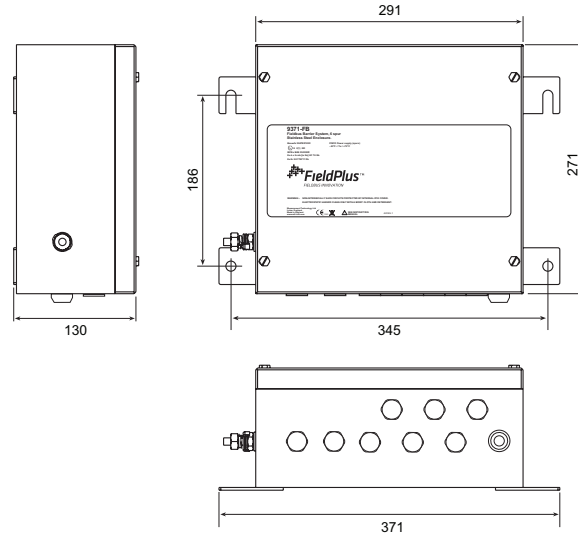
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DIMENSIONS (mm)

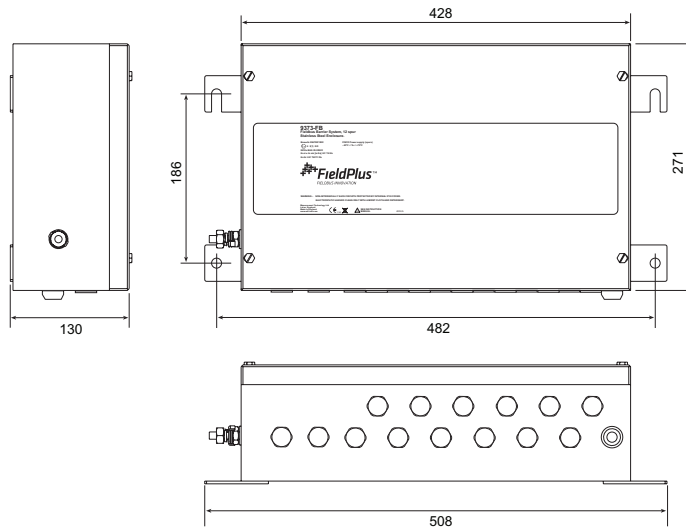
Mounting holes: **SS** models:- Ø 10.8mm.

9371-FB-xx-SS



9373-FB-xx-SS

9374-FB-xx-SS



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