937x-FB2-Px-SS range

Fieldbus Barriers, 6 and 12 spur, Stainless Steel (SS) enclosures

- **For FOUNDATION™ fieldbus networks in hazardous areas**
- **Complete enclosure system 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**

The 937x-FB2-Px-SS range of 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, the Fieldbus 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-FB2-Px range is supplied as complete, factory-assembled systems in stainless steel (SS) enclosures that do not require additional wiring, customised housing or complex ancillary components. Electrical and mechanical aspects of the design are integrated for a ergonomic solution for 'High Energy Trunk' applications in hazardous areas.

The key modular components of the system (Fieldbus Barriers 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.

Enclosure systems for 6 or 12 spurs are supported. For added flexibility, the 12-spur enclosure can be specified part-populated with one 6-spur barrier module installed. This permits future expansion from six to twelve spurs simply by plugging in an additional module.

The 937x-FB2-PC-SS range of Fieldbus Barriers are 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 F800 or 9180 range of fieldbus power supplies in redundant or non-redundant format.

Powering Business Worldwide

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SPECIFICATION

SPURS	9371-FB2	9373-FB2	9374-FB2* (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

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, 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.) All spurs at 32mA	9371-FB2	9373-FB2	9374-FB2*
	1.8W	3.6W	1.8 (+1.8)W

** See ordering information*

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
Colour: Black

Cable types and capacity	Cable cross-section, mm²
Rigid cable	0.5 to 2.5
Flexible cable	0.5 to 2.5

Spur field wiring terminals
Type: 3-way, pluggable
Colour: Blue

Cable types and capacity	Cable cross-section, mm²
Rigid cable	0.2 to 2.5
Flexible cable	0.25 to 2.5

Grounding of cable screens (trunk & spurs)
(Configured with wire link in the Trunk Terminal Area)

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 bottom face 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.

PHYSICAL NETWORKS

IEC61158-2
FOUNDATION™ fieldbus H1

Profile type (according to FF-816)
Type 163 (isolated device coupler)
Compliant 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
Ⓔx II 2(1) GD
Ex d e ib mb [ia Ga] IIC T4 Gb
Ex tb IIIC T80°C Db

Certificate numbers
Baseefa 14ATEX0112X
IECEx BAS 14.0058X

Safety description (spurs)

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

Spurs in accordance with FISCO standard IEC 60079-11

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 – 1:2013
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

Enclosure Materials
Silver, Stainless Steel (SS)

Mounting position (recommended)
On vertical plane, with glands and breather on underside

Cable/Breather entries

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

Enclosures can be shipped with no stopping plugs or pre-fitted with an Ex e nickel-plated brass 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.

Ingress Protection
Enclosure: IP66
Intrinsically safe terminals : IP20
Ex e terminals: IP30

Enclosure sizes - see dimension drawing for details

9371-FB2-Px-SS (6 spurs)	271 x 306 x 139mm
9373-FB2-Px-SS (12 spurs)	271 x 443 x 139mm

Enclosure Weights †

MTL Part number	Weight (kg)
9371-FB2-Px-SS	5.7
9373-FB2-Px-SS	8.5
9374-FB2-Px-SS	7.6

† excludes any cable glands or surge protection items

ORDERING INFORMATION

Order as:

9371-FB2-Px-SS	6-spur Fieldbus Barrier enclosure with **one** 6-spur 9377-FB-R module installed.
9373-FB2-Px-SS	12-spur Fieldbus Barrier enclosure system with **two** 6-spur 9377-FB-R modules installed.
9374-FB2-Px-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-R module) *(Note: All enclosures are pre-wired and include a F93-XE Fieldbus terminator module)* *Where Px = PS (pluggable screw terminal connectors or PC (pluggable spring clamp connectors)*
9377-FB-R	Fieldbus Barrier 6-spur, pluggable module
F93-XE	Fieldbus terminator
9376-SP	Trunk surge protection module
FS32	Spur surge protection module

ASSOCIATED LITERATURE

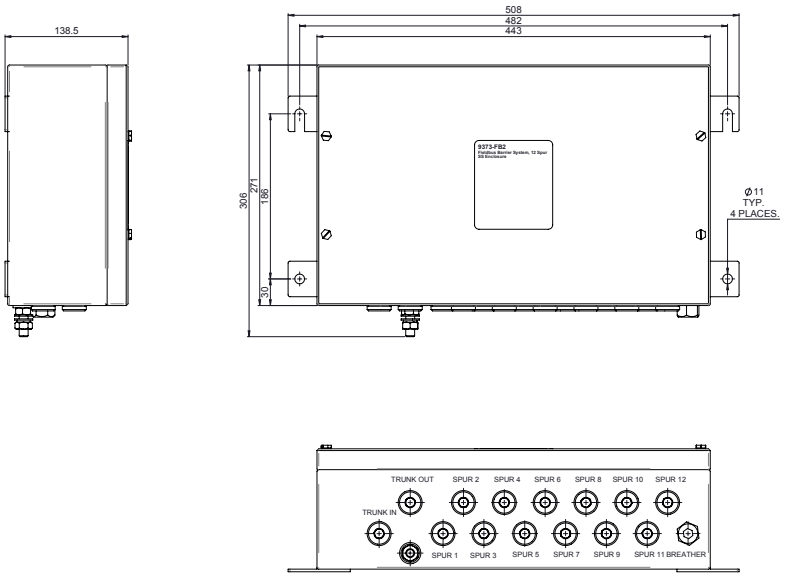
Instruction Manual **INM937x-FB2-Px-SS**

DIMENSIONS (mm)

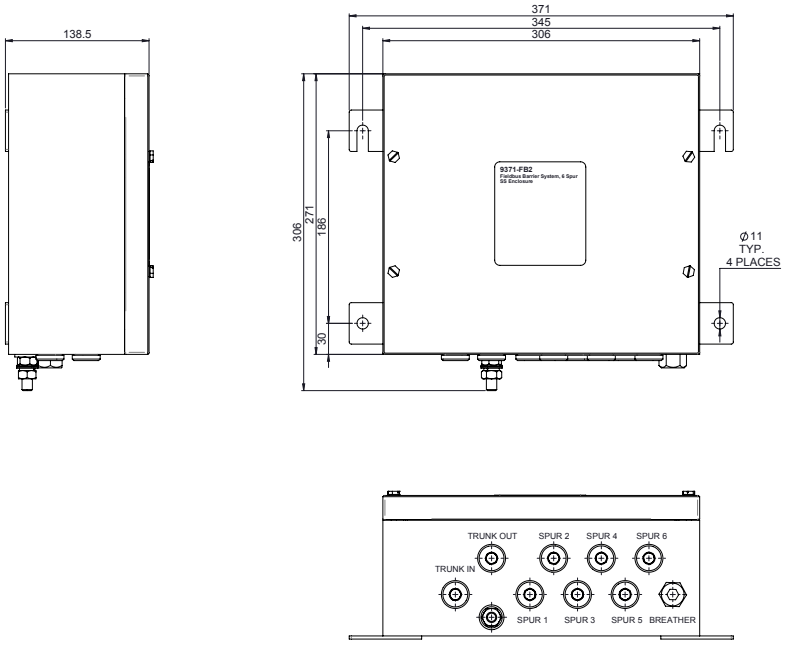
Mounting holes: 6.5mm slot, 12mm head max.

9373-FB2-Px-SS

9374-FB2-Px-SS



9371-FB2-Px-SS



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