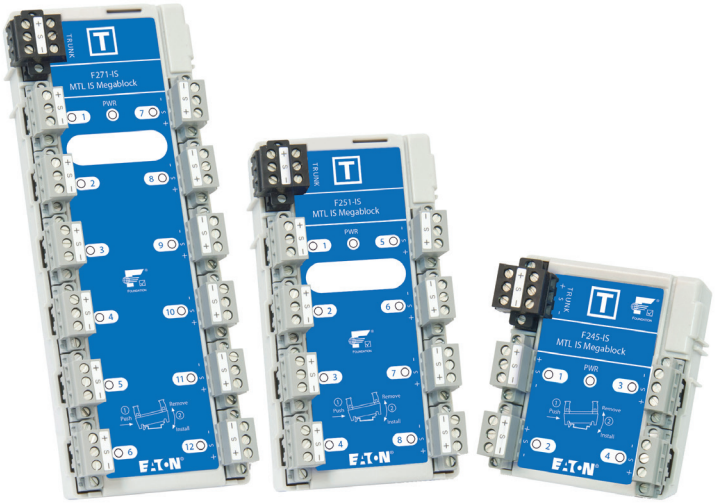
F2xx-IS MTL IS Megablock range

Passive hubs for zone 1 fieldbus networks



The F2xx-IS MTL Intrinsically Safe (IS) Megablocks are DIN-rail mounted passive hubs for Foundation™ fieldbus networks. They connect several IS field devices to the network IS trunk cable and provide short circuit protection to the segment. Megablocks minimize hand wiring and allow individual IS devices to be added to and removed from the segment without disrupting network communication.

A green power LED on each unit indicates whether at least 9V dc is present. Megablocks are available in four, eight and twelve drop versions. Multiple Megablocks are easily wired to one another to allow larger segments to be constructed.

Megablocks are available with an integral terminator making them ideal for a star or "chickenfoot" topology where several devices are connected at a single field junction box. Megablocks having a built-in terminator are clearly marked ('T') for easy identification by field personnel.

Connections to the Megablock are made using pluggable, screw-terminal or spring clamp type connectors. This allows wire terminations to be made to the individual connectors which are then plugged into the Megablock. Devices can then be connected and disconnected easily during commissioning. After commissioning, retaining screws are tightened to secure each connector to the Megablock.

The Trunk connection is a single connector that supports two cable connections. For Megablocks without an Integral terminator this allows the Trunk to continue to another Megablock. Disconnecting the Megablock by unplugging the Trunk connector does not then disrupt a downstream Megablock. The Trunk connector is easily identified by its black color and larger size.

SpurGuard™ is a device-port, short circuit protection technique that minimizes susceptibility to single points of failure. The Megablocks are supplied with built-in SpurGuard™ protectors that prevent a short circuit in any of the individual transmitters or spur cable runs from bringing the entire fieldbus segment down. A red LED near each spur connection indicates that a spur is shorted and is in "over-current" mode.

Megablock hazardous area approvals permit installation in a variety of configurations in Zone 1 or 2. Within Zone 1, the F2xx-IS Megablocks are designed for installation in intrinsically safe applications, and are compatible with FISCO or Entity-approved field instruments. An intrinsically safe fieldbus allows live connection/disconnection of the fieldbus without the need for a gas clearance certificate, which assists in commissioning, maintenance and system expansions.

To select the Megablock for your application see the Ordering Information section of this document.

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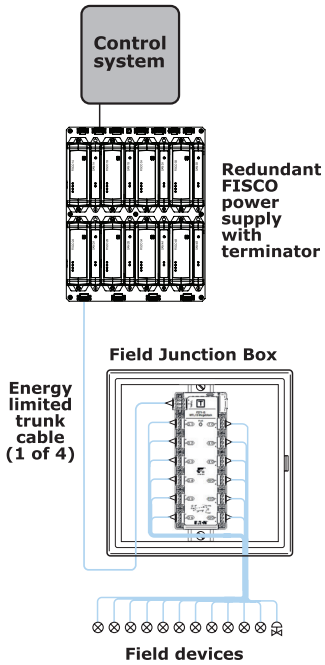
Publication No. EPS F2xx-IS Rev 3
September 2021

INSTALLATION

Megablocks can be mounted vertically or horizontally using 35 mm DIN-rail within a suitable enclosure, such as a field junction box. Use of DIN-rail end stops is recommended to prevent sliding in vertical installations. The eight and twelve port Megablocks have labeling areas so that segments can be easily identified according to plant standards.

We have a wide range of standard junction box designs for use with Megablocks. See the data sheet for the range of Process JBs.



Shown above is an example of a common Fieldbus segment topology. Twelve field devices are connected to a twelve-drop Megablock, which is mounted in a field junction box. The trunk connector on the Megablock is wired to the segment trunk cable that leads to the control room or marshalling panel where the IS power supply and second terminator are located.

GROUNDING

To prevent ground loops, a fieldbus segment should only be grounded at one point. This is usually done by grounding the cable shield at the control room end of the segment. If a permanent segment ground connection in the field is desired, this can be achieved by wiring the shield terminal on one of the Megablock connectors to a suitable earth ground.

Fieldbus Connection System (FCS) wiring blocks are protected by U.S. Patents 6,366,437, 6,369,997 and 6,519,125.

SPECIFICATIONS

Mounting requirements
35mm DIN-rail "Top Hat"

Wire capacity
0.14 to 2.5mm^2
Recommended screwdriver torque setting: 0.5-0.6Nm

Case material
Polycarbonate

Temperature range
Operating –50° to +70°C
Storage –50° to +85°C
Relative humidity 0 to 90%, non-condensing

Voltage required to activate power LED
9-10V dc

Minimum input voltage
10.0V (*See Note 1 below*)

Maximum input voltage
see certification ratings

Maximum input current
see certification ratings

Intrinsically Safe Megablock with SpurGuard™

Unloaded current consumption

No. of Ports	4	8	12
mA	1.7	2.4	3.1

Spur device current
29mA maximum, 50mA maximum (for F245-IS-6) - Only one device per spur for both 29mA and 50mA

Spur short-circuit current
42.5mA maximum, 63mA maximum (for F245-IS-6)

Trunk-to-trunk voltage drop
N/A

Trunk-to-spur voltage drop
0.3V maximum

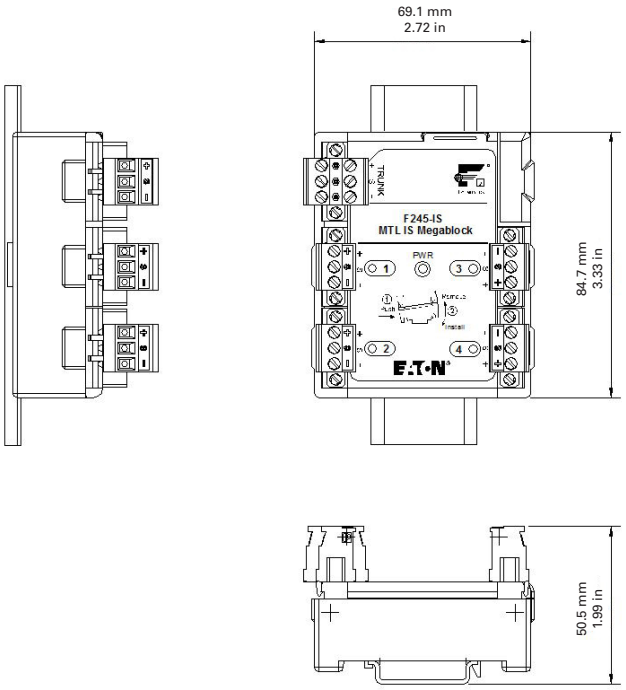
PHYSICAL NETWORK

IEC 61158-2
Foundation™ fieldbus H1
Profibus PA

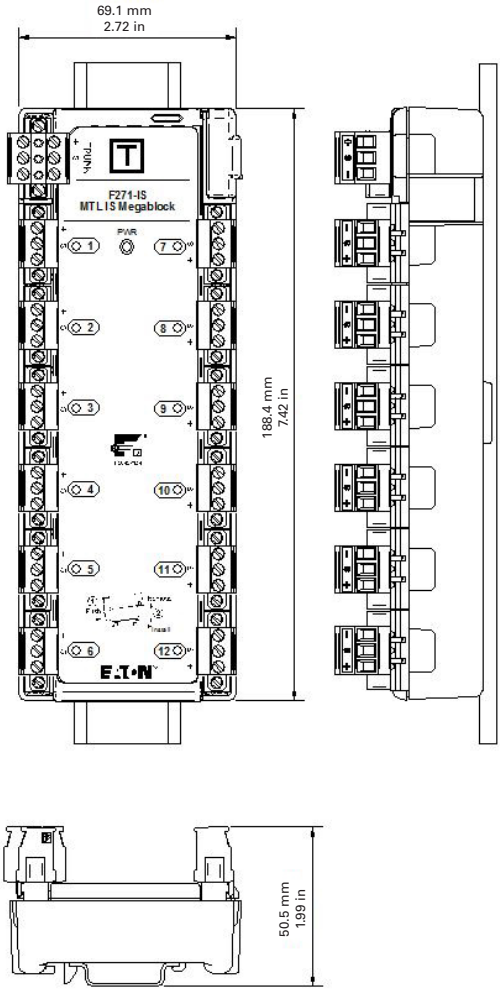
Note 1: The minimum input voltage guarantees that the spur output under full load will be at least 9.3V so that the device will see at least 9.0V.

CASE DIMENSIONS

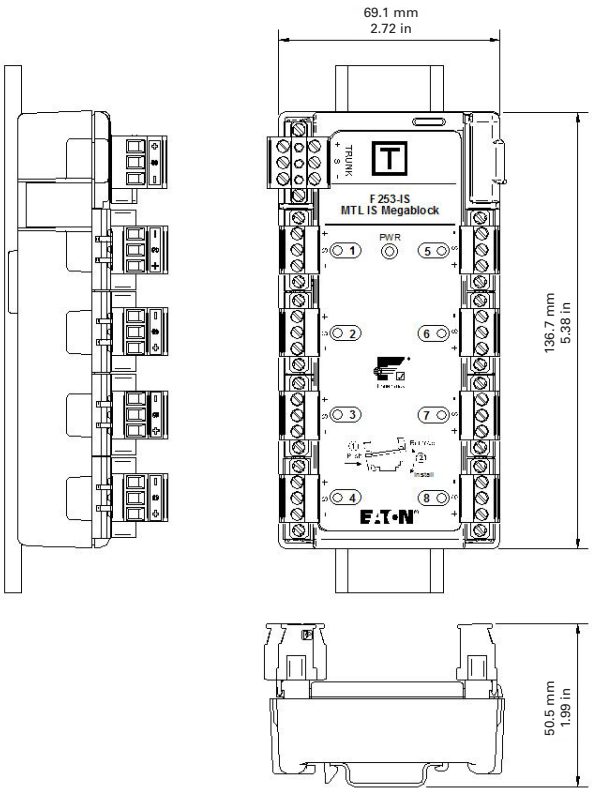
4-WAY - F245/247-IS



12-WAY - F271-IS



8-WAY - F251/253-IS



APPROVALS - *(for full certification information visit www.mtl-inst.com/certificates/)*

MODELS - F245-IS, F247-IS, F251-IS, F253-IS, F271-IS, F245-IS-6

Country	Global	Europe		International		UK	
Authority	**FieldComm Group™**	**LCIE (ATEX)**		**LCIE (IECEx)**		**CML (UKCA)**	
Standard	FF-846	EN 60079-0 EN 60079-11		IEC 60079-0 IEC 60079-11		EN 60079-0 EN 60079-11	
Approved for	See specification	Ⓔx II 1G Ex ia IIC T4 Ga		Ex ia IICT4 Ga		Ⓔx II 1G Ex ia IIC T4 Ga	
Certificate no.	**DC/111200/1**	**LCIE 17 ATEX 3010 X**		**IECEx LCI 11.0068X**		**CML 21UKEX2702X**	
Apparatus parameters (Trunk)	See specification	ENTITY Intrinsically safe Ui ≤ 24V Ii ≤ 250mA Ci = 0 Li = 0 Pi ≤ 1.2W	FISCO Intrinsically safe Ui ≤ 17.5V Ii ≤ 380mA Ci = 0 Li = 0 Pi ≤ 5.32W	ENTITY Intrinsically safe Ui = 24V Ii = 250mA Ci = 0 Li = 0 Pi =1.2W	FISCO Intrinsically safe Ui =17.5V Ii = 380mA Ci = 0 Li = 0 Pi = 5.32W	ENTITY Intrinsically safe Ui ≤ 24V Ii ≤ 250mA Ci = 0 Li = 0 Pi ≤ 1.2W	FISCO Intrinsically safe Ui ≤ 17.5V Ii ≤ 380mA Ci = 0 Li = 0 Pi ≤ 5.32W

ACCESSORIES

Description	Part Number
Heavy Duty DIN-rail end stop	ETL7000
35mm DIN-Rail, 1 metre length	THR7000
Process JB carbon loaded GRP‡	FCS-85XX
Process JB stainless steel‡	FCS-95XX

‡ See Process JB data sheets for further details

ORDERING INFORMATION

Megablocks	Screw Terminal	Spring Clamp Terminal
4 way	F245-IS	F245-IS-PC
4 way with internal Terminator	F247-IS	F247-IS-PC
4 way 60mA	F245-IS-6	F245-IS-6-PC
8 way	F251-IS	F251-IS-PC
8 way with internal Terminator	F253-IS	F253-IS-PC
12 way with internal terminator	F271-IS	F271-IS-PC

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Publication No. EPS F2xx-IS Rev 3 070921
September 2021

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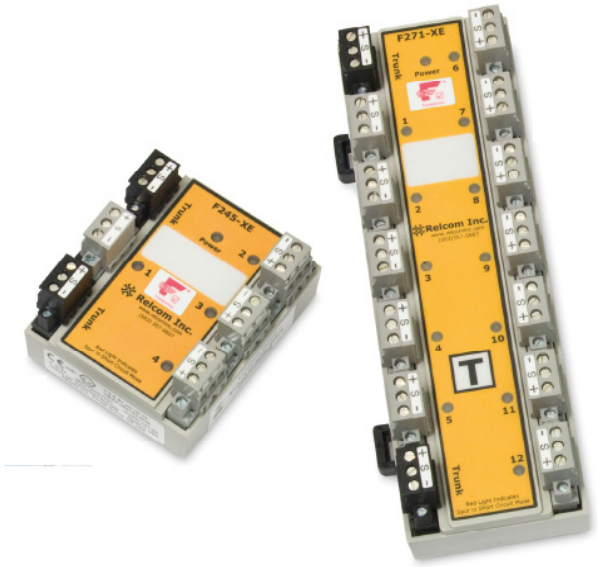
F2xx-XE megablock range

Passive hubs for zone 1 & division 1 fieldbus networks



Megablocks are DIN-rail mounted passive hubs for Foundation™ fieldbus networks. They connect several field devices to the network trunk cable and provide short circuit protection to the segment. Megablocks minimize hand wiring and allow individualdevices to be added to and removed from the segment without disrupting network communication.

A green power LED on each unit indicates whether at least 9V dc is present. F2xx-XE Megablocks are available in two, four, eight, ten and twelve drop versions. Multiple Megablocks are easily wired to one another to allow larger segments to be constructed.

Megablocks are available with an integral terminator making them ideal for a star or "chickenfoot" topology where several devices are connected at a single field junction box. Separate Megablock Terminators are also available, whch may be wired easily to any Megablock. Megablocks having a built-in terminator are clearly marked ('T') for easy identification by field personnel.

Connections to the Megablock are made using pluggable, screw-terminal type connectors. This allows wire terminations to be made to the individual connectors which are then plugged into the Megablock. Devices can then be connected and disconnected easily during commissioning. After commissioning, retaining screws are tightened to secure each connector to the Megablock.

Trunk connections for the fieldbus home-run/ trunk cable are easily identified by their black connectors. Separate numbered connections are provided for each spur drop.

SpurGuard™ is a device-port, short circuit protection technique that minimizes susceptibility to single points of failure. The Megablocks are available with built-in SpurGuard™ protectors that prevent a short circuit in any of the individual transmitters or spur cable runs from bringing the entire fieldbus segment down. A red LED near each spur connection indicates that a spur is shorted and is in "over-current" mode.

For applications using flameproof certified devices, the F2xx-XE Megablocks are designed to meet the requirements for increased safety for installation in an Ex e junction box in Zone 1. See the F300 Series Megablock datasheet for applications in safe areas, Zone 2 and Division 2 hazardous areas.

To select the Megablock for your application see the Ordering Information section of this document.

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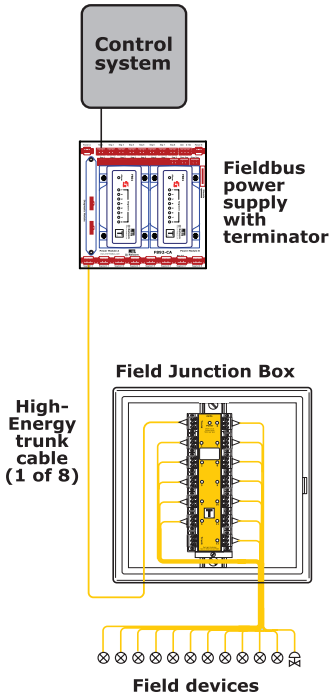
Publication No. EPS F2xx-XE Rev 2
May 2021

INSTALLATION

Megablocks can be mounted vertically or horizontally using 35 mm DIN rail within a suitable enclosure, such as a field junction box. Megablocks are removed from the DIN rail using a flat blade screwdriver to release the mounting platform. Use of DIN rail end stops is recommended to prevent sliding in vertical installations. The four, eight, ten and twelve port Megablocks have labeling areas so that segments can be easily identified according to plant standards.

We have a wide range of standard junction box designs for use with Megablocks. See the data sheet for the range of Process JBs.



Shown above are examples of common Fieldbus segment topologies. Twelve field devices are connected to a twelve-drop Megablock, which is mounted in a field junction box. The trunk connector on the Megablock is wired to the segment trunk cable that leads to the control room or marshalling panel where the power supply and second terminator are located. The example shows the increased safety (Ex em) version connected to a general purpose fieldbus power supply.

GROUNDING

To prevent ground loops, a fieldbus segment should only be grounded at one point. This is usually done by grounding the cable shield at the control room end of the segment. If a permanent segment ground connection in the field is desired, this can be achieved by wiring the shield terminal on one of the Megablock trunk connectors to a suitable earth ground instead of wiring it to the shield terminal on the Megablock Terminator.

Fieldbus Connection System (FCS) wiring blocks are protected by U.S. Patents 6,366,437, 6,369,997 and 6,519,125.

SPECIFICATIONS

Mounting requirements
35mm DIN rail

Wire capacity
0.14 to 2.5mm^2
Recommended screwdriver torque setting: 0.5-0.6Nm

Case material
Lexan polycarbonate

Temperature range
Operating –45° to +70°C
Storage –50° to +85°C
Relative humidity 0 to 90%, non-condensing

Voltage required to activate power LED
9.2V dc minimum

Minimum input voltage
10.0V (*See Note 1 below*)

Maximum input voltage
see certification ratings

Maximum input current
see certification ratings

Trunk-to-trunk voltage drop
0.1V maximum

F245-XE - F271-XE (Ex em) Megablock with SpurGuard™

Unloaded current consumption

No. of Ports	4	8	10	12
mA	1.7	2.5	2.9	3.2

Spur device current
29mA maximum (recommend one device per spur)

Spur short-circuit current
40mA maximum

Trunk-to-trunk voltage drop
0.1V maximum

Trunk-to-spur voltage drop
0.3V maximum

PHYSICAL NETWORK

IEC 61158-2
Foundation™ fieldbus H1
Profibus PA

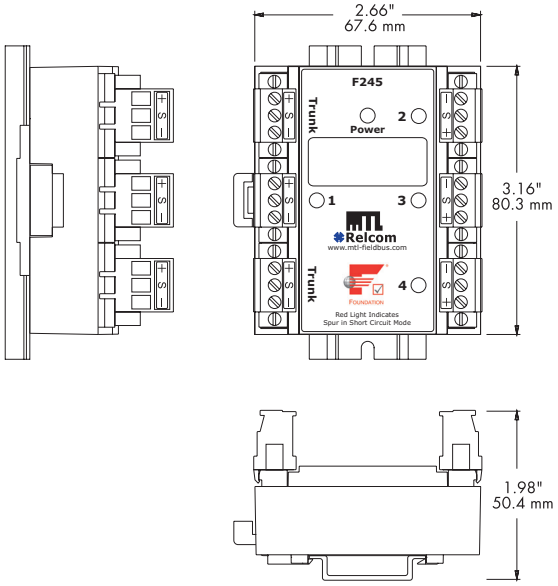
Note 1: The minimum input voltage guarantees that the spur output under full load will be at least 9.3V so that the device will see at least 9.0V.

MTL F2xx-XE

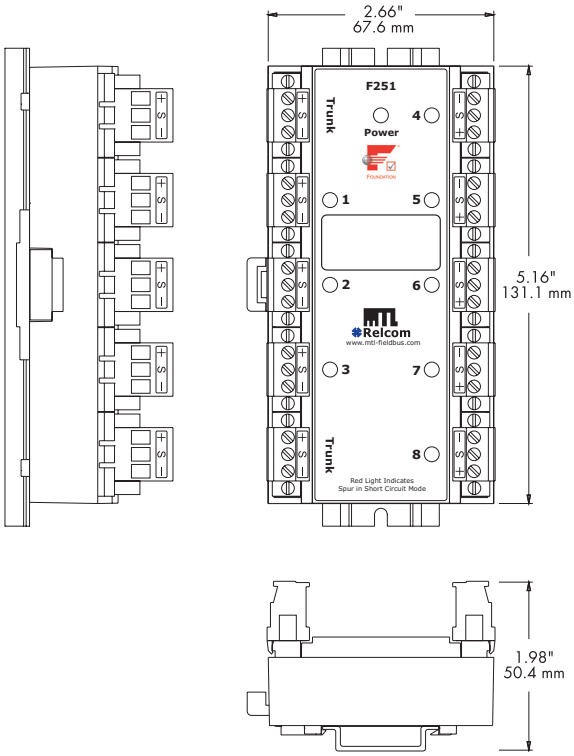
May 2021

CASE DIMENSIONS

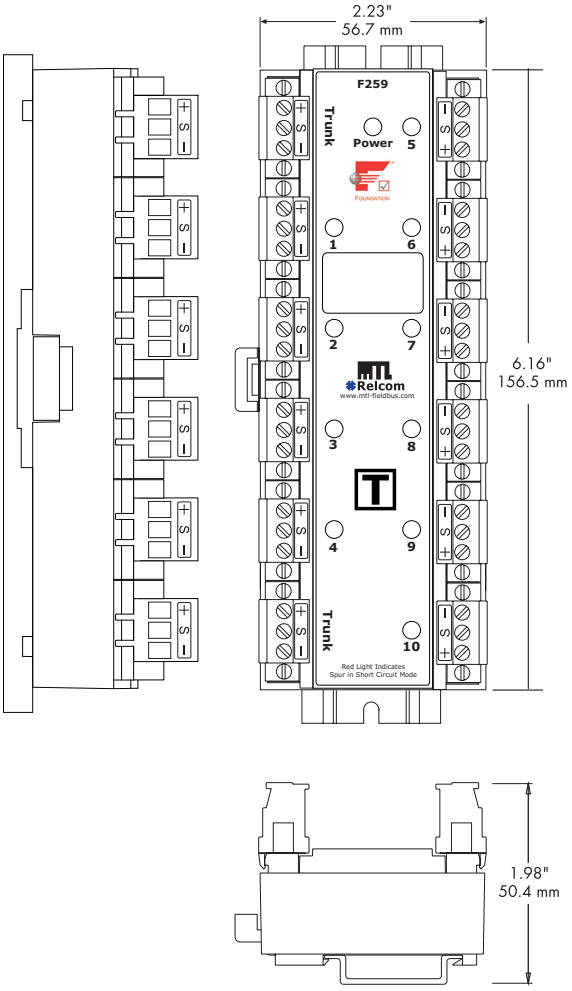
4-WAY - F245(-XE), F247(-XE)



8-WAY - F251(-XE), F253(-XE)



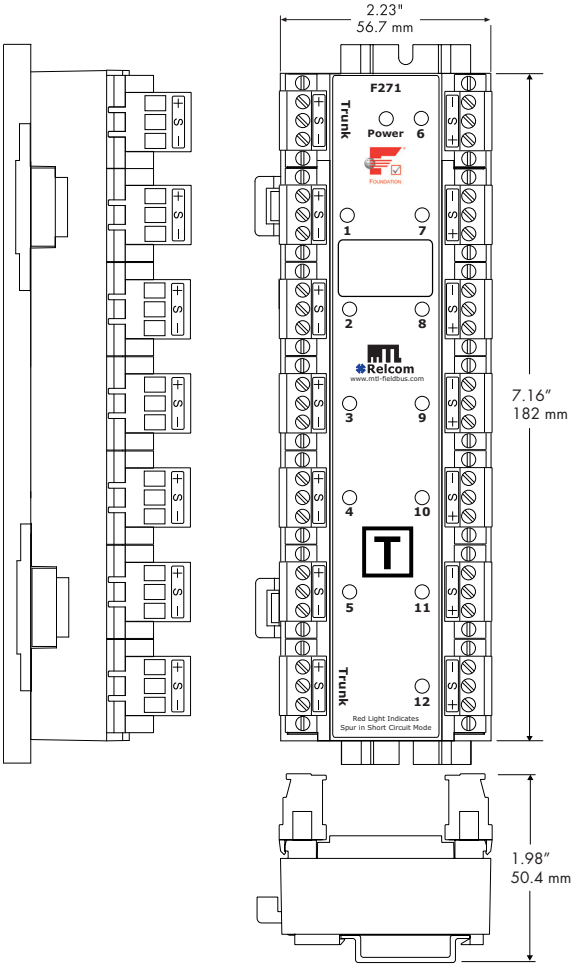
10-WAY - F259(-XE)



Note: Different Megablock versions have minor variations in labelling.

CASE DIMENSIONS *(continued)*

12-WAY - F271(-XE)



APPROVALS - *(for full certification information visit www.mtl-inst.com/certificates/)*

MODELS - F245-XE, F247-XE, F251-XE, F253-XE, F259-XE, F271-XE

Country	Global	Europe	International
Authority	**Fieldbus Foundation™**	**KEMA (ATEX)**	**IEC Ex**
Standard	FF-846	EN 60079-0 EN 60079-11 EN 60079-7	IEC 60079-0 IEC 60079-18 IEC 60079-7
Approved for	See specification	⟨Ex⟩ II 2 G Ex eb mb IIC T4 Gb	Ex eb mb IIC T4 Gb
Certificate no.	DC067300	KEMA05ATEX2006	IECEx DEK 16.0036X
Trunk wiring parameters	See specification	Rated voltage 30V DC Rated Current 1.5A	Rated voltage 30V DC Rated Current 1.5A

ACCESSORIES

Description	Part Number
Heavy Duty DIN rail end stop	ETL7000
35mm DIN Rail, 1 metre length	THR7000
Process JB carbon loaded GRP‡	FCS-85XX
Process JB stainless steel‡	FCS-95XX

‡ See Process JB data sheets for further details

ORDERING INFORMATION

Megablocks	Zone 1 Ex eb mb
4 way	F245-XE
4 way with internal Terminator	F247-XE
8 way	F251-XE
8 way with internal Terminator	F253-XE
10 way with internal Terminator	F259-XE
12 way with internal terminator	F271-XE

See Fieldbus Terminators datasheet for details of separate DIN-rail mounted terminators.

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MTL F300 megablock range

Passive hubs for general purpose, zone 2 & division 2 fieldbus networks

- **Single-piece Trunk In/Trunk Out connector simplifies installation and maintenance**
- **Pluggable trunk and spur surge protection option**
- **Choice of rising cage clamp screw or spring clamp terminals**
- **Locate Megablock in Zone 2 or Division 2**
- **Connect to Ex nA, Ex ic or non-incendive devices in Zone 2/Division 2**
- **Connect to Ex d, explosionproof devices in Zone 1/Division 1**

F300 Megablocks are DIN-rail mounted passive hubs for FOUNDATION™ fieldbus H1 and Profibus PA networks for general purpose, Zone 2 and Division 2 applications. They provide a simple means of connecting field devices to the network trunk cable, and protect the segment from spur short circuits. Megablocks minimize hand wiring and allow individual devices to be added to and removed from the segment without disrupting network communication. A green power LED on each unit indicates whether at least 10V dc is present. F300 Megablocks are available in four, eight, and twelve drop versions.

The black Trunk In/Out pluggable connector allows replacement of a Megablock without breaking the trunk connection to other devices on the fieldbus segment. The F97 terminator supplied should be mounted in the Trunk-out connection to provide termination when the Megablock is located at the end of the fieldbus segment; alternatively, if the segment is extended, it can be removed to ensure the correct termination is maintained.

Spur connections to the Megablock are made using pluggable, grey, screw-terminal or spring clamp terminal connectors. Wire terminations can be made to the individual connectors before plugging them into the Megablock. Devices can then be connected and disconnected easily during commissioning. After commissioning, retaining screws are tightened to secure each connector to the Megablock. Separate numbered connections are provided for each spur drop.

SpurGuard™ is a device-port, short circuit protection technique that minimizes susceptibility to single points of failure. The F300 Megablock has built-in SpurGuard™ protectors that prevent a short circuit in any of the individual field devices or spur cable runs, from bringing down the entire fieldbus segment. A red LED near each spur connection indicates when a spur is shorted and hence in "over-current" mode.

The optional FS32 modules can provide surge protection for the F300 products on both the trunk and spur terminals. These pluggable modules are simple to fit in a new installation, or as a retrofit option.

A range of MTL Process Junction Boxes in stainless steel and carbon loaded, glass-reinforced polyester are available for mounting Megablock wiring components. They offer plenty of space for termination and wiring, making it easy to install and maintain the fieldbus system.

F300 Megablock hazardous area approvals permit installation in a variety of configurations in Zone 2 and Division 2 hazardous areas. Typically, F300 Megablocks may be installed with non-sparking (non-arcing) trunk and spur connections. Alternatively, when connected to suitably certified fieldbus power supplies, the trunk may be non-sparking (non-arcing) with non-incendive or intrinsically safe Ex ic spur connections.

When installed on a non-sparking trunk with Ex ic spurs, an F300-A01 trunk-spur partition must be installed on the F300 Megablock. The trunk-spur partition is supplied as a pack of 5, as detailed in the Accessories section of this document.

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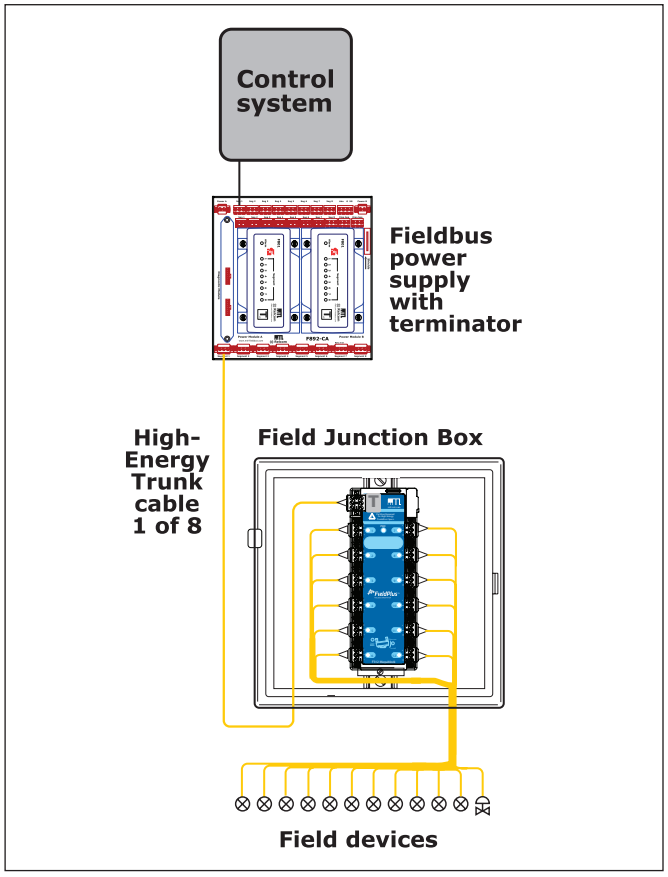
Publication No. EPS F300 Rev 10
April 2022

INSTALLATION

Megablocks can be mounted vertically or horizontally using 35mm DIN rail within a suitable enclosure, such as a field junction box. We have a wide range of standard junction box designs for use with Megablocks. See the data sheet for the range of Process JBs.

F300 Megablocks can be clipped onto or removed from the DIN rail without any tools. Use of DIN rail end stops is recommended to prevent sliding in vertical installations.



Shown above is an example of a common Fieldbus segment topology. Twelve field devices are connected to a twelve-drop Megablock, which is mounted in a field junction box. The trunk connector on the Megablock is wired to the segment trunk cable that leads to the control room or marshalling panel where the power supply and second terminator are located.

GROUNDING

To prevent ground loops, the fieldbus segment shield should only be grounded at one point. This is usually done by grounding the cable shield at the control room end of the segment.

SURGE PROTECTION - (see right)

The design of the F300 has made the installation of effective surge protection on trunk and spur cabling a simple matter, through the use of individual FS32 modules. Grounding bars are available, that clip easily onto the Megablocks to provide both mechanical support for the FS32 modules as well as a way of connecting them to a local low-impedance ground point to dissipate any induced surge currents.

SPECIFICATIONS

Mounting requirements
35mm DIN rail

Wire capacity
0.14 to 2.5mm²

Case material
Polycarbonate

Temperature range
Operating –45° to +70°C
Storage –50° to +85°C

Voltage required to activate power LED
10.0V dc minimum

Minimum input voltage

No. of Ports	4	8	12
V	10.4	10.5	10.6

Maximum input voltage
see certification ratings

Minimum spur output voltage
9.35V

Maximum input current
see certification ratings

Trunk-to-trunk voltage drop
0.1V maximum

Unloaded current consumption (maximum)

No. of Ports	4	8	12
mA	3.2	4.8	6.5

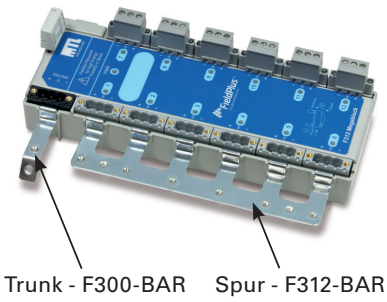
Spur device current
38mA maximum (recommend one device per spur)

Spur short-circuit current
56mA maximum

Trunk-to-spur voltage drop
1.25V maximum

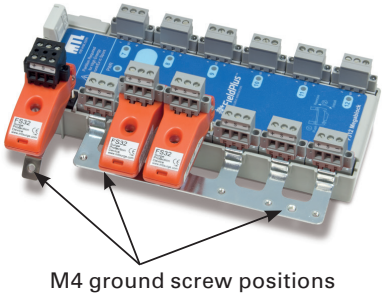
PHYSICAL NETWORK

IEC 61158-2
Foundation™ fieldbus H1
Profibus PA



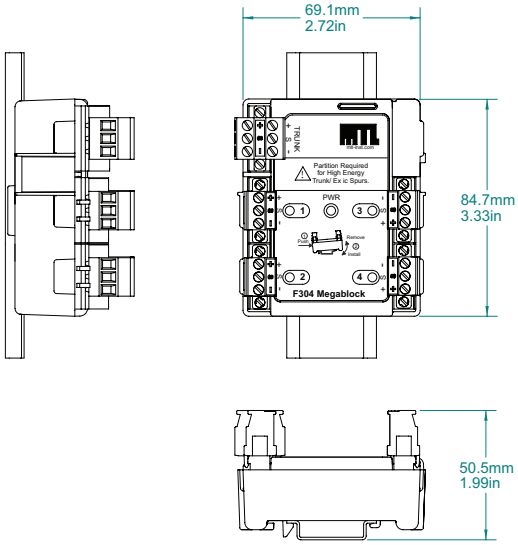
Grounding bars on an F312 model.

FS32 modules fitted to trunk and two spurs.

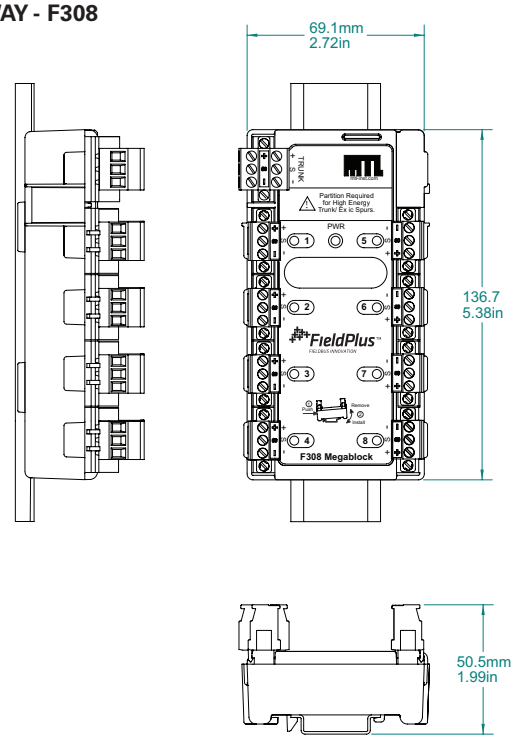


CASE DIMENSIONS

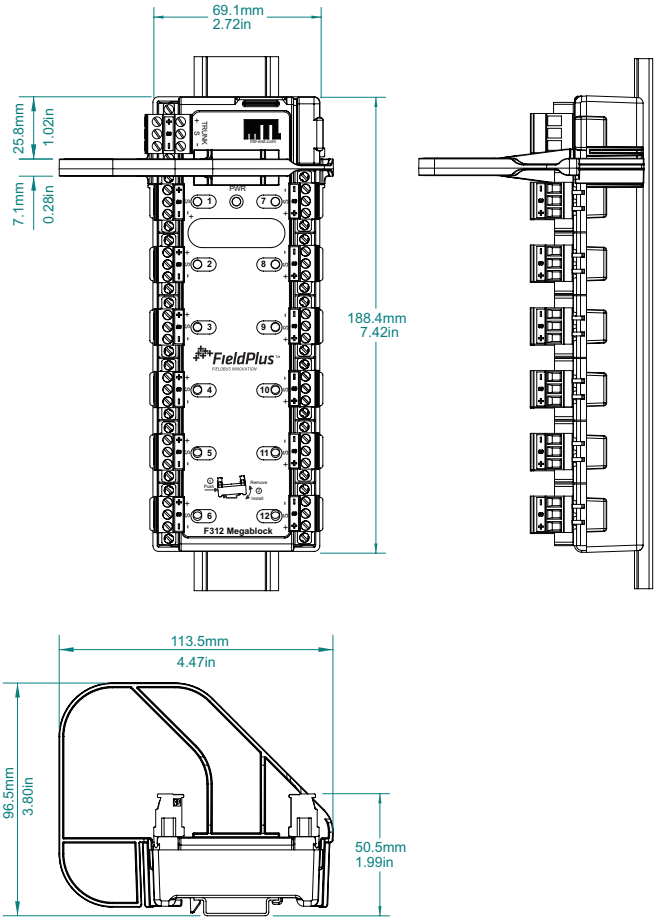
4-WAY - F304



8-WAY - F308



12-WAY - F312 (showing trunk-spur partition)



Note: Different Megablock versions have minor variations in labelling.

APPROVALS - for full certification information visit www.mtl-inst.com/certificates

Country	Europe		International	
Authority	**ATEX & UKEX (Category 3)**		**IECEx**	
Standard	EN 60079-0 EN 60079-11 EN 60079-15 EN 60079-7 : 2015/A1	EN 60079-0 EN 60079-11	IEC 60079-0 IEC 60079-11 IEC 60079-15 IEC 60079-7	IEC 60079-0 IEC 60079-11
Approved for	Ⓔx II 3 G Ex nA [ic] IIC T4 Gc not for-V2 models* Ex ec IIC T4 Gc Ex ec [ic] IIC T4 Gc not for-V2 models* Ta =-50°C to +70°C	Ⓔx II 3 G Ex ic IIC T4 Gc Ta =-50°C to +70°C	Ex nA [ic] IIC T4 Gc not for-V2 models* Ex ec IIC T4 Gc Ex ec [ic] IIC T4 Gc not for-V2 models* Ta =-50°C to +70°C	Ex ic IIC T4 Gc Ta =-50°C to +70°C
Certificate no.	RELC11ATEX1010 (ATEX) RELC21UKEX1012X (UKEX)	RELC11ATEX1010X (ATEX) RELC21UKEX1012X (UKEX)	IECEx FMG 11.007X	IECEx FMG 11.007X
Apparatus parameters (Trunk)	Non-arcing U_i = 24V (IIC) U_i = 32V (IIB, IIA) I_i = 2A C_i = 0, L_i = 0	Energy Limited FISCO ic	Non-arcing U_i = 24V (IIC) U_i = 32V (IIB, IIA) I_i = 2A C_i = 0, L_i = 0	Energy Limited FISCO ic
Cable parameters (Spur)	Energy limited $U_o = U_o$ of power supply with voltage limiting to EN 60079-11 I_o = 56mA, C_o = 80nF L_o = 0.15mH (IIC) L_o = 0.26mH (IIB, IIA)	Energy Limited FISCO ic	Energy limited $U_o = U_o$ of power supply with voltage limiting to IEC 60079-11 I_o = 56mA, C_o = 80nF L_o = 0.15mH (IIC) L_o = 0.26mH (IIB, IIA)	Energy Limited FISCO ic

Country	USA		Canada	
Authority	**FM**	**FM**	**FMc**	**FMc**
Standard	3600 3611 3810 ANSI/ISA 60079-0 ANSI/ISA 60079-7 ANSI/ISA 60079-11	3600 3611 3810 ANSI/ISA 60079-0 ANSI/ISA 60079-7 ANSI/ISA 60079-11	CSA-C22.2 No. 213-M CSA-C22.2 No. 61010-1 CSA-C22.2 No. 60079-0 CSA-C22.2 No. 60079-7 CSA C22.2 No. 60079-11 CSA-C22.2 No. 60079-15 CSA C22.2 No. 60079-15	CSA-C22.2 No. 213-M CSA-C22.2 No. 61010-1 CSA-C22.2 No. 60079-0 CSA-C22.2 No. 60079-7 CSA C22.2 No. 60079-11 CSA-C22.2 No. 60079-15 CSA C22.2 No. 60079-15
Approved for	NI/I/2/ABCD/T4 Ta=-50°C to +70°C I /2/IIC/T4 Ta=-50°C to +70°C	NI/I/2/ABCD/T4 Ta=-50°C to +70°C I/2/IIC/T4 Ta=-50°C to +70°C	NI/I/2/ABCD/T4 Ta=-50°C to +70°C I/2/Ex nA [nL] IIC T4 Ex ec IIC T4 Gc Ex ec [ic] IIC T4 Gc not for-V2 models* Ta=-50°C to +70°C	NI/I/2/ABCD/T4 Ta=-50°C to +70°C Ex nA IIC T4 Ta=-50°C to +70°C
Certificate no.	FM17US0075X	FM17US0075X	FM17CA0041X	FM17CA0041X
Apparatus parameters (Trunk)	Non-arcing	Non-arcing Vmax = 24V Gas Groups A, B (IIC) Vmax = 32V Gas Groups C, D (IIB, IIA) Imax = 2A Voc = Vmax power supply	Non-arcing Vmax = 24V Gas Groups A, B (IIC) Vmax = 32V Gas Groups C, D (IIB, IIA) Imax = 2A Voc = Vmax power supply	Non-arcing
Cable parameters (Spur)	Non-arcing	Non-incendive field wiring I_{sc} = 56mA C_a = 80nF L_a = 0.15mH Gas Groups A, B (IIC) L_a = 0.26mH Gas Groups C, D (IIB, IIA) P_o = 1.344W Groups D, B P_o = 1.792W Groups C, D	Energy limited I_{sc} = 56mA C_a = 80nF L_a = 0.15mH Gas Groups A, B (IIC) L_a = 0.26mH Gas Groups C, D (IIB, IIA)	Non-arcing

*An **F300-A01** trunk spur partition must be installed for Ex nA [ic] and Ex ec [ic] applications. See Accessories below.

ORDERING INFORMATION

F304	4 way Megablock – screw terminals - including F97 terminator
F308	8 way Megablock – screw terminals - including F97 terminator
F312	12 way Megablock – screw terminals - including F97 terminator
F304-PC	4 way Megablock – spring-clamp terminals - including F97 terminator
F308-PC	8 way Megablock – spring-clamp terminals - including F97 terminator
F312 -PC	12 way Megablock – spring-clamp terminals - including F97 terminator

ACCESSORIES

F300-A01-5	Trunk-spur partition – pack of 5
FS32†	Fieldbus Surge Protector
F300-BAR-5	Pack of 5 F300 trunk bars
F304-BAR-10	Pack of 10 F304 spur bars (two F304-BARs required for each F304)
F308-BAR-10	Pack of 10 F308 spur bars (two F308-BARs required for each F308)
F312-BAR-1	Pack of 10 F312 spur bars (two F312-BARs required for each F312)

† See datasheet on our web site for full technical specification

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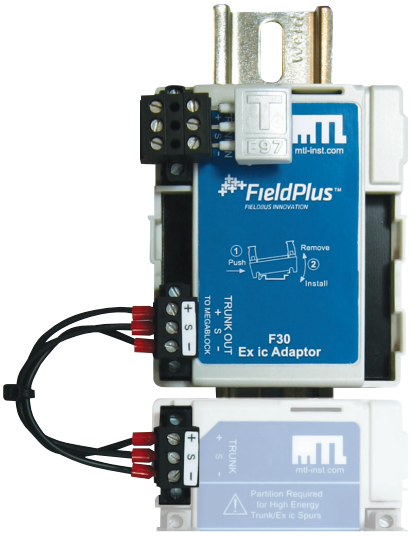
F30 Ex ic Adaptor

Accessory for F300 range of Megablock Wiring Hubs

- **Use with F300 range of Megablocks and 918x-x2 range of fieldbus power supplies to provide Ex ic intrinsically safe spurs for FOUNDATION™ Fieldbus networks**
- **Allows spurs to be live-worked in Zone 2 when connected to suitably certified field instruments**
- **Compatible with FISCO and Entity certified fieldbus devices**
- **Installs with Megablock in field junction box**
- **Supports long trunk cable lengths and heavily loaded fieldbus segments**



The F30 Ex ic Adaptor is an accessory to F300 range of Megablock wiring hubs, and provides intrinsically safe Ex ic spur connections for fieldbus networks in Zone 2 hazardous areas. One F30 is used with each Megablock, to limit the voltage at the spurs to Ex ic levels. When connected to suitably certified fieldbus instruments, the spurs may be live-worked in accordance with normal intrinsic safety procedures. The F30 is completely transparent to all fieldbus communications.

The F30 is compatible with F304, F308 and F312 Megablock types, typically providing up to 12 Ex ic spurs per fieldbus segment. Up to two F30s and their associated Megablocks may be connected to a single segment, to allow the fieldbus trunk to be extended between junction boxes in the field.

The spurs are compatible with FISCO and Entity certified fieldbus instruments. Where FISCO instruments are selected, cable parameter calculations are not required.

To comply with intrinsic safety requirements, each fieldbus segment must be powered by a 918x-x2 fieldbus power supply, fitted with 9192-FP power modules.

Ex ic replaces the earlier Ex nL technique for energy-limited fieldbus networks, and brings the technique into line with formal intrinsic safety procedures.

A key benefit of the MTL Ex ic spur solution is that the fieldbus power supply has a higher output voltage than competing products, allowing longer trunk cable lengths and more fieldbus instruments per segment. Requirements for ensuring compatibility with major host control systems are also simplified.

The F30 is designed for installation in the field enclosure together with the Megablock wiring hub. A full range of compatible stainless steel and glass reinforced polyester (GRP) enclosures are available.

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F30 Ex ic Adaptor

September 2016

SPECIFICATION

MECHANICAL/ENVIRONMENTAL

Mounting requirements
35mm DIN rail, to EN50022

Weight
(including cable) 90g (typ)

Wire capacity
0.14 to 2.5mm²

Case material
Polycarbonate

Temperature range
Operating –40° to +70°C
Storage –40° to +85°C

ELECTRICAL

Relative Humidity
0 to 95% non-condensing

Trunk input voltage range
11.0 - 24.0V DC

Trunk Output voltage range
10.8 – 15.6V DC

Absolute maximum input voltage
32.0V DC without damage

Reverse Polarity Protection
Continuous protection against damage

Maximum input current
300mA (input voltage up to 21V DC)

Trunk output voltage limit, Uo @ 25°C
17.5V DC max

Quiescent Current
5mA max

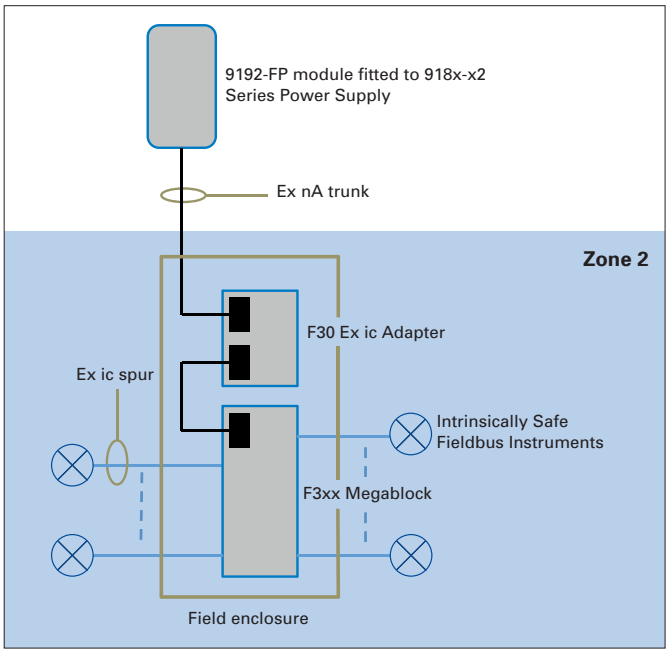
PHYSICAL NETWORK

IEC 61158-2
FOUNDATION™ fieldbus H1
Profibus PA
Maximum spur cable length when used in conjunction with F300 range of Megablocks: 120m (FISCO and Entity spur applications)

HAZARDOUS AREA APPROVALS

Certification code
II 3G Ex nA IIC T4 Gc

Certification numbers
DEKRA ATEX 0129X
IECEx DEK 13.0038X

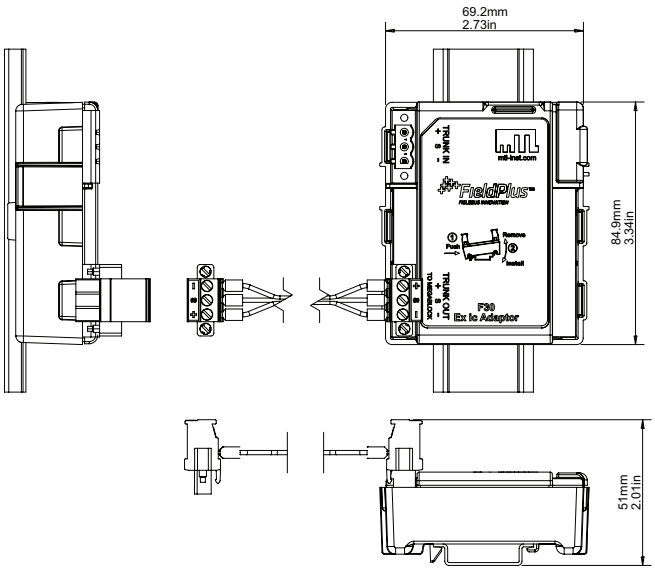


ORDERING INFORMATION

F30	Ex ic Adapter, screw clamp terminals

Note: The F30 is supplied with a preassembled cable for connecting to the Trunk Terminals of the associated Megablock. A Trunk connector is not supplied with the F30; this is transferred from the Megablock to the F30 during installation.

DIMENSIONS (mm)



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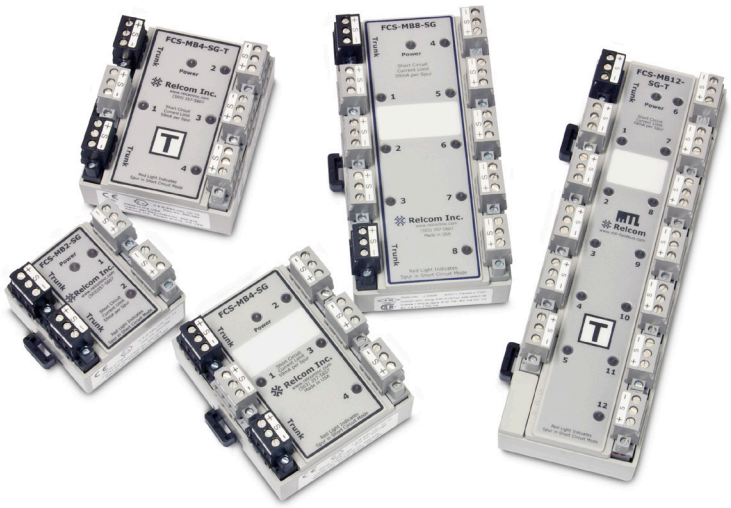
Technical data
MTL fieldbus networks

July 2021
EPS MBx Rev 5

CROUSE-HINDS SERIES

FCS-MBx-SG Megablock range*

Passive hubs for general purpose, Zone 2 & Division 2 fieldbus networks



Megablocks are DIN-rail mounted passive hubs for FOUNDATION™ fieldbus networks. They connect several field devices to the network trunk cable and provide short circuit protection to the segment. Megablocks minimize hand wiring and allow individual devices to be added to and removed from the segment without disrupting network communication.

A green power LED on each unit indicates whether at least 9V dc is present. Megablocks are available in four, eight, ten and twelve drop versions. Multiple Megablocks are easily wired to one another to allow larger segments to be constructed.

Megablocks are available with an integral terminator making them ideal for a star or "chickenfoot" topology, where several devices are connected at a single field junction box. Separate Megablock Terminators are also available, which may be wired easily to any Megablock. Megablocks having a built-in terminator are clearly marked ('T') for easy identification by field personnel.

Connections to the Megablock are made using pluggable, screw-terminal type connectors. This allows wire terminations to be made to the individual connectors which are then plugged into the Megablock. Devices can then be connected and disconnected easily during commissioning. After commissioning, retaining screws are tightened to secure each connector to the Megablock.

Trunk connections for the fieldbus home-run/trunk cable are easily identified by their black connectors. Separate numbered connections are provided for each spur drop.

SpurGuard™ is a device-port, short circuit protection technique that minimizes susceptibility to single points of failure. The FCS-MBx-SG Megablocks range has built-in SpurGuard™ protectors that prevent a short circuit in any of the individual transmitters or spur cable runs, from bringing down the entire fieldbus segment. A red LED near each spur connection indicates when a spur is shorted and hence in "over-current" mode.

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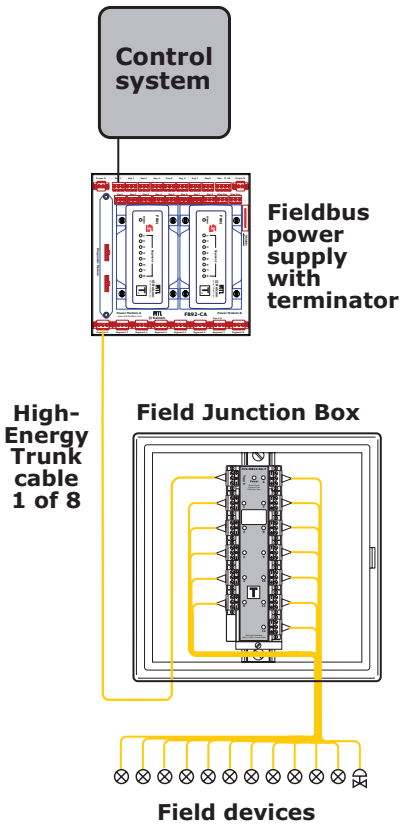
Publication No. EPS MBx Rev 5
July 2021

INSTALLATION

Megablocks can be mounted vertically or horizontally using 35 mm DIN rail within a suitable enclosure, such as a field junction box. Megablocks are removed from the DIN rail using a flat blade screwdriver to release the mounting platform. Use of DIN rail end stops is recommended to prevent sliding in vertical installations. FCS-MBx range Megablocks have labeling areas so that segments can be easily identified according to plant standards.

MTL have a wide range of standard junction box designs for use with Megablocks. See the data sheet for the range of Process JBs.



Shown above is an example of a common Fieldbus segment topology. Twelve field devices are connected to a twelve-drop Megablock, which is mounted in a field junction box. The trunk connector on the Megablock is wired to the segment trunk cable that leads to the control room or marshalling panel where the power supply and second terminator are located.

GROUNDING

To prevent ground loops, a fieldbus segment should only be grounded at one point. This is usually done by grounding the cable shield at the control room end of the segment. If a permanent segment ground connection in the field is desired, this can be achieved by wiring the shield terminal on one of the Megablock trunk connectors to a suitable earth ground instead of wiring it to the shield terminal on the Megablock Terminator.

Fieldbus Connection System (FCS) wiring blocks are protected by U.S. Patents 6,366,437, 6,369,997 and 6,519,125.

SPECIFICATIONS

Mounting requirements
35mm DIN rail

Wire capacity
0.14 to 2.5mm^2

Case material
Lexan polycarbonate

Temperature range
Operating –45° to +70°C
Storage –50° to +85°C

Voltage required to activate power LED
9.2V dc minimum

Minimum input voltage
10.5V (See Note 1 below)

Maximum input voltage
see certification ratings

Maximum input current
see certification ratings

Trunk-to-trunk voltage drop
0.1V maximum

FCS-MBx-SG, F118 & F215 Megablock with SpurGuard™

Unloaded current consumption

No. of Ports	4	8	10	12
mA	4.1	4.3	4.4	4.5

Spur device current
46mA maximum (recommend one device per spur)

Spur short-circuit current
60mA maximum

Trunk-to-trunk voltage drop
0.1V maximum

Trunk-to-spur voltage drop
1.1V maximum

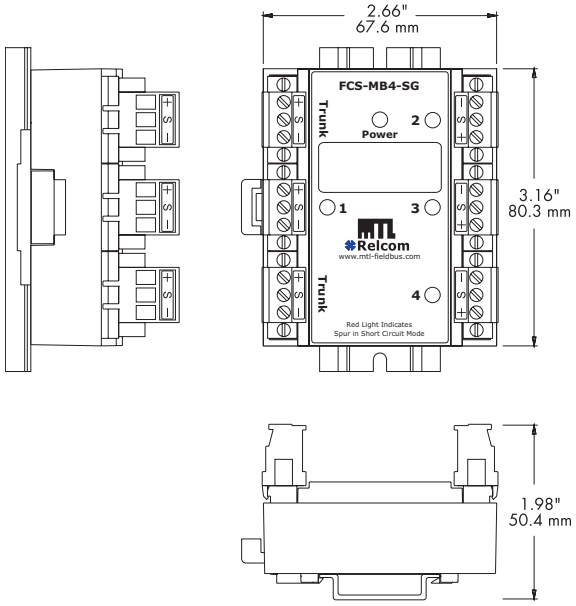
PHYSICAL NETWORK

IEC 61158-2
Foundation™ fieldbus H1
Profibus PA

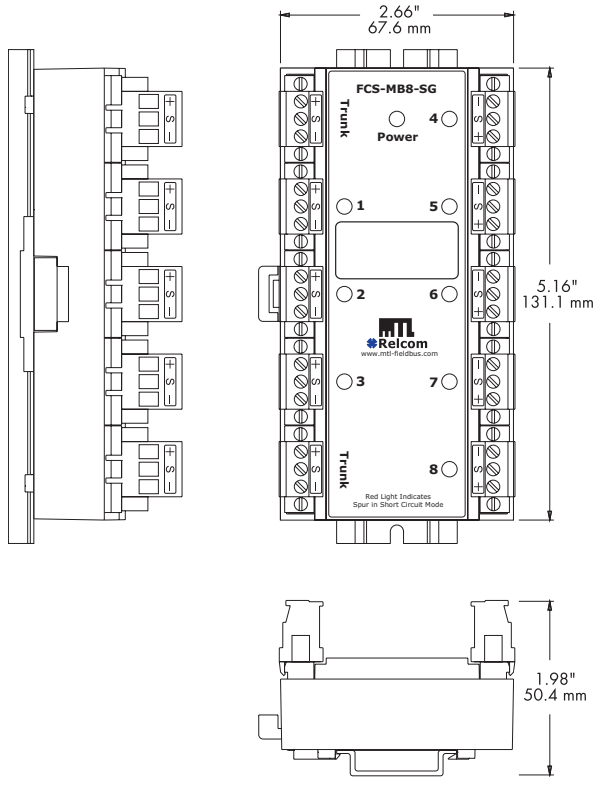
Note 1: The minimum input voltage guarantees that the spur output under full load will be at least 9.3V so that the device will see at least 9.0V.

CASE DIMENSIONS

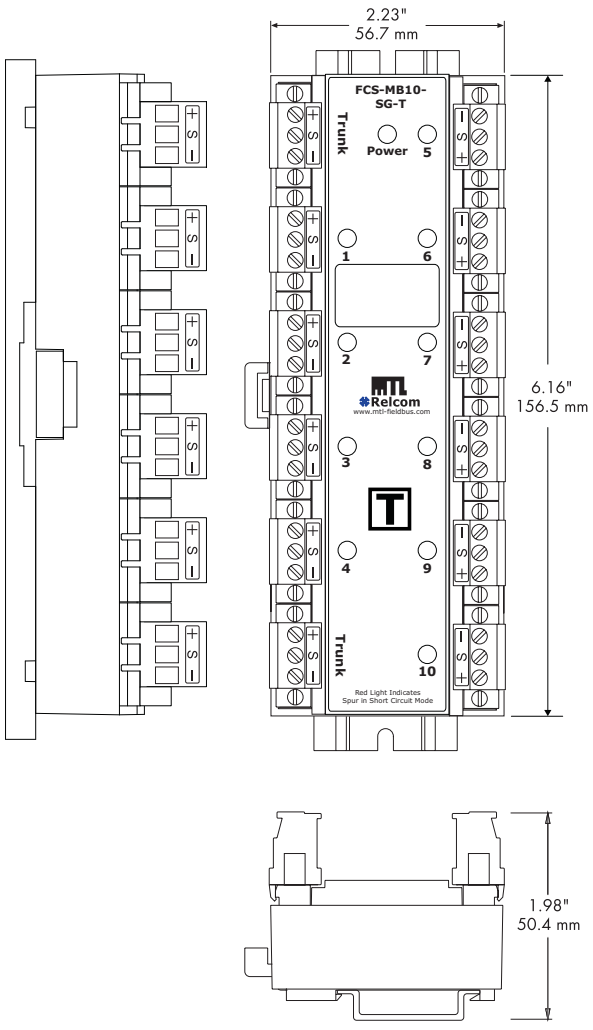
4-WAY - FCS-MB4-SG(-T)



8-WAY - FCS-MB8-SG(-T)



10-WAY - F118, FCS-MB10-SG(-T)

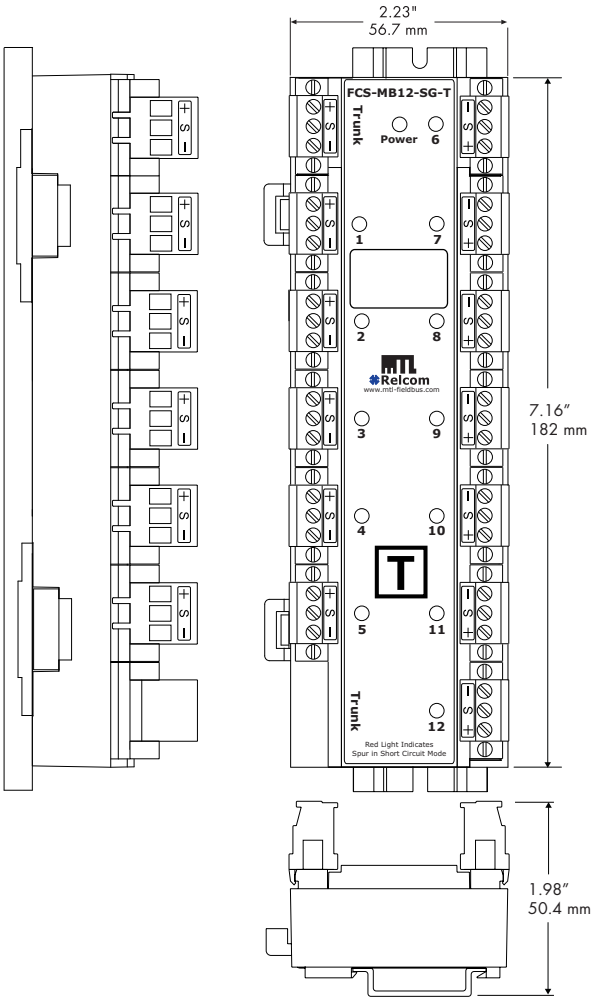


Note: Different Megablock versions have minor variations in labelling.

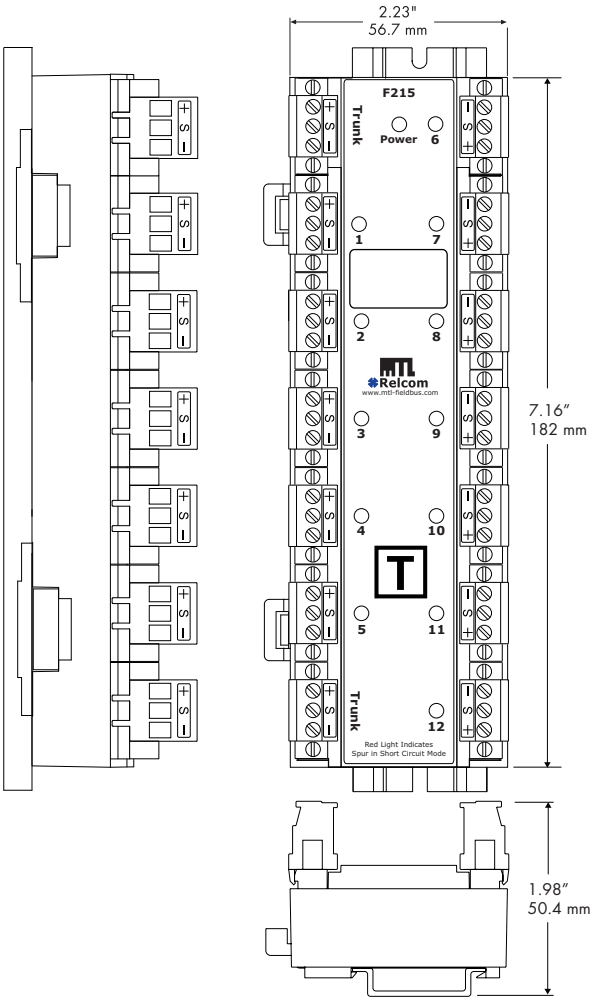
CASE DIMENSIONS (cont)

12-WAY MEGABLOCKS

FCS-MB12-SG(-T)



F215



MTL FCS-MBx-SG

July 2021

APPROVALS - for full certification information visit www.mtl-inst.com/support/certificates/

MODELS - F118, F215, FCS-MB4-SG-[T], FCS-MB8-SG-[T], FCS-MB10-SG-[T], FCS-MB12-SG-[T]

Country	Europe	USA		Canada	
Authority	**ATEX (Category 3)**	**FM**	**FM**	**FMc**	**FMc**
Standard	EN 60079-0 EN 60079-15	3600 1998 3611 1999 3810 1989	3600 1998 3611 1999 3810 1989	CSA C22.2 No. 213 :1987 CSA E60079-0: 2002 CSA E60079-15: 2002 CSA C22.2 No.1010.1:1992 + Amendment 2 1997	CSA C22.2 No. 213 :1987 CSA E60079-0: 2002 CSA E60079-15: 2002 CSA C22.2 No.1010.1:1992 + Amendment 2 1997
Approved for	⟨Ex⟩ II 3 G Ex nA IIC T4 Gc	NI/I/2/ABCD/T4 Ta=70ºC I / 2 / IIC /T4 Ta=70ºC	NI-ANI/I/2/ABCD/T4 Ta=70ºC NI-ANI/I/2/IIC/T4 Ta=70ºC	NI-ANI/I/2/ABCD/T4 Ta=70ºC Ex nA [nL] IIC T4 Ta=70ºC	NI/I/2/ABCD/T4 Ta=70ºC Ex nA IIC T4 Ta=70ºC
Certificate no.	RELC07A-TEX1001X	3013269	3013852	3039092C	3039410C
Apparatus parameters (Trunk)	Non-arcing	Non-arcing	Non-arcing	Non-arcing	Non-arcing
Cable parameters (Spur)	Non-arcing	Non-arcing	Non-incendive V_{oc} = 32V I_{sc} = 60mA C_a = 85nF L_a = 0.26mH	Non-incendive V_{oc} = 32V I_{sc} = 60mA C_a = 85nF L_a = 0.26mH	Non-arcing

ORDERING INFORMATION

	With SpurGuard™ short-circuit protection
	General Purpose and Zone/Division 2
Megablocks	
4 way	FCS-MB4-SG
4 way with internal Terminator	FCS-MB4-SG-T
8 way	FCS-MB8-SG
8 way with internal Terminator	FCS-MB8-SG-T
10 way	FCS-MB10-SG
10 way with internal Terminator	FCS-MB10-SG-T
10 way with switched Terminator	F118
12 way	FCS-MB12-SG
12 way with internal terminator	FCS-MB12-SG-T
12 way with switched Terminator	F215

See Fieldbus Terminators datasheet for details of separate, DIN-rail mounted terminators

ACCESSORIES

Description	Part Number
Heavy Duty DIN rail end stop	ETL7000
35mm DIN Rail, 1 metre length	THR7000
Process JB stainless steel‡	FCS-96XX

‡ See Process JB data sheets for further details

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Process JBs

Process junction boxes for fieldbus installations

- **Easy to install & maintain**
- **Standard proven designs reduce project costs**
- **Superb corrosion resistance**
- **Wide choice of cable gland types**
- **All glanding holes are located in the base of the enclosure**
- **Generous space for cable terminations**
- **Strong, high impact resistance, durable**

Eaton's MTL Process JBs are designed for mounting Megablock fieldbus wiring components, terminators, F30 Ex ic adaptor, 9320 spur connections, surge protection devices and MTL831 Multiplexer transmitters in order to meet the exacting requirements of process industry customers.

MTL wiring components are established as the industry standard for fieldbus device connections and are combined with Crouse-Hinds junction box and cable glands in the Process JB product range.

Process JBs make it easy to install and maintain the fieldbus system. For example, a minimum of 75mm (3") of clearance is provided for fieldbus cable connections. This ensures that the correct bend radius is maintained when connecting to the full range of MTL wiring components.

The FCS-9000 series that provide strength, durability and corrosion resistance to many chemicals and their vapours. The enclosures are manufactured from 316 stainless steel to provide the highest level of corrosion protection.

A wide choice of glands is available, ready fitted to the junction box: stainless steel and nickel-plated brass enabling a high quality seal with standard or wire-armoured cables. All glanding is in the base of the enclosure with a minimum of 75mm of clearance between the base of the enclosure and other components. This makes glanding much easier, especially when terminating armoured cable.

Significant cost savings can be made on a fieldbus project by selecting standard, and proven, fieldbus junction box designs. It eliminates the need for custom designs when choosing junction boxes for fieldbus applications and saves the cost of managing the specification and the eventual procurement of the junction boxes.

To select the Process JB appropriate to your application; first determine the number of fieldbus device connections, and hence the number of spur connections required in the junction box. This will also define which Megablocks (and maybe terminators) are required. Use the application examples to help you. For MTL831C applications, the enclosure choice will depend on the number of transmitters (maximum 2 x MTL831C) to be fitted inside the enclosure.

Identify any additional items that will need to be housed in the enclosure, e.g. terminals for terminating spare cables, Ex ic adaptor, additional terminators, etc. Calculate how much DIN rail they will require. Add this to length of the Megablock(s) and choose an enclosure with sufficient rail length.

Finally, decide on gland type. Is the cable armoured? Does the environment require stainless steel or nickel plated brass glands? See application example tables and ordering information for details on how to fully specify the enclosure in your order.

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Publication No. EPS PJB Rev G
March 2022

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FCS-9000 range

Junction boxes

The FCS-9000 range of enclosures are manufactured from polished 316 stainless steel to provide the highest levels of corrosion resistance for the harshest process environments.

The FCS-96xx Process JBs are suitable for Zone 2 and Zone 1 intrinsically safe (Ex i) and increased safety applications.

The fieldbus junction boxes are available pre-drilled for one segment: having trunk-in, trunk-out and 4 spur connections; or a trunk-in and 8 or 12 spur connections; or two segments having a trunk-in and 24 spur connections. Two-pair multicore trunk cable may be used when only a single trunk gland is available.

For temperature multiplexer applications, junction boxes are available for a single MTL831C with a data highway in and 16 sensor connections and for 2 MTL831C units with a data highway in and 32 sensor connections.

The wide choice of glands, including stainless steel and nickel-plated brass, enables a high quality seal with standard or wire armoured cables.

The box incorporates a rain channel that prevents standing water from damaging the one-piece seal; diverting it away from the contents when the door is opened. A 10mm earth stud and a breather are also included as standard.

An adhesive backed, Traffolyte tag label is supplied loose or can be engraved with the tag number and fitted, if details are supplied when ordering.

SPECIFICATION

GENERAL

Materials
Electrochemically polished 316 Stainless Steel
Silicone gasket

DIN rail
FCS-9604, FCS-9608, FCS-9612,
FCS-9616, FCS-9642: - one (1) DIN rail
FCS-9624, FCS-9362: - two (2) DIN rails
DIN rail to EN 50022 35 x 7.5 'T' section, mounted vertically
Each rail fitted with two end stops

Breather plug
Provided

External earth connection
M10 threaded stud

Tag label
Traffolyte, adhesive backed - white background - black text

Other
Hinged lid

ENVIRONMENTAL

Operating Temperature
–40°C to +70°C

Storage Temperature
–40°C to +80°C

Relative Humidity % RH (non-condensing)
5 to 95%

IP rating
IP66 to EN 60529

Impact resistance
7 Nm to IEC 60079-7

Location of Process JB
Safe area, Zone 2, IIC T4 hazardous area or Zone 1, IIC T4 hazardous area for intrinsically safe fieldbus segment.

Note: If used in a hazardous area, the contents must be suitably certified/approved.

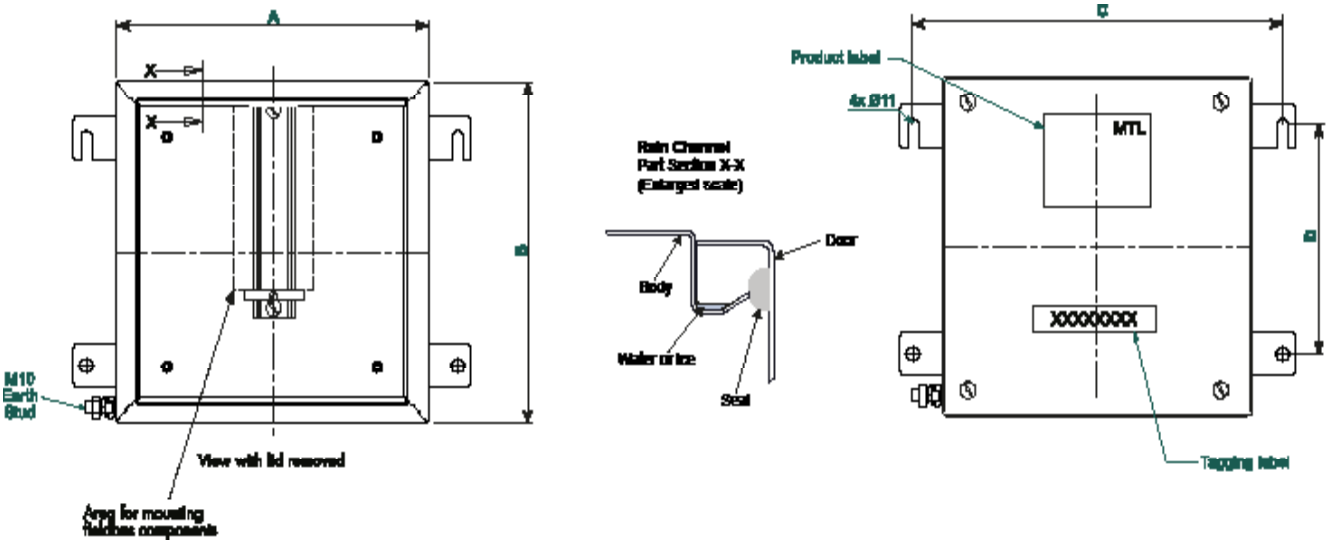
APPLICATION EXAMPLES

Model	Max. glands	DIN rail length mm	Megablocks /trunk	No of trunks	Spurs/ trunk	Trunk in	Trunk out	Total spurs	-ZZ* value	Unused DIN rail length mm
Single trunk applications										
FCS-9604	6	166	2 way 4 way 4 way(T)	1 1 1	2 4 4	1 1 1	1 1 -	2 4 4	0 0 0	111 80 80
FCS-9608	9	166	4 way + 2 way 8 way 8 way(T)	1 1 1	6 8 8	1 1 1	1 1	6 8 8	0 0 0	30 30 30
FCS-9612	13	200	12 way (T) Ex ic + 4 way (T)	1 1	12 4	1 1	- -	12 4	12 4	- 12
FCS-9642	13		Ex ic + 8 way (T) Ex ic + 12 way (T)	1 1	8 12	1 1	- -	12 12	12 12	- -
FCS-9624	25	2 x 260	8 way + 8 way(T)	1	16	1	-	16	16	2 x 150
Double trunk applications										
FCS-9624	25	2 x 260	2 x 8 way(T) 2 x 10 way(T) 2 x 12 way(T) 2 x Ex ic 12 way(T)	2 2 2 2	8 10 12 12	1 (2-pair multicore) 1 (2-pair multicore) 1 (2-pair multicore) 1 (2-pair multicore)	- - - -	16 20 24 24	16 20 24 24	2 x 150 2 x 129 2 x 93 2 x 8

(T) = Megablock with integral terminator * see ordering information

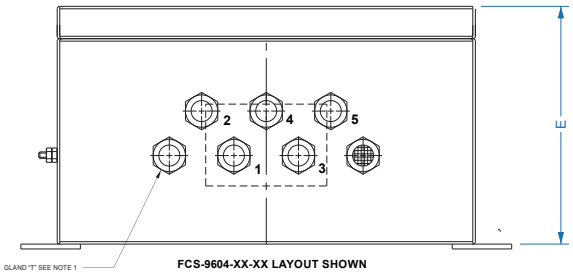
Model	Max. glands	Multiplexer sensor channels	No of Data Highway
FCS-9616	17	16	1
FCS-9632	33	32	1

ENCLOSURE AND MOUNTING DETAILS

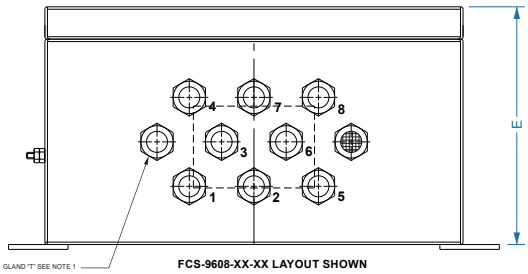


	A	B	C	D	E	F	Weight
FCS-9604	260	260	316	158	152	N/A	6.0 - 6.5kg
FCS-9608	260	260	316	158	152	N/A	6.0 - 7.0kg
FCS-9612	305	305	362	203	152	N/A	7.0 - 8.2kg
FCS-9616	305	305	362	203	203	N/A	7.2 - 8.4kg
FCS-9632	508	406	564	267	203	185	10.3 - 12.5kg
FCS-9624	508	406	564	267	152	185	10.0 - 12.2kg
FCS-9642	305	406	362	267	152	N/A	7.2 - 8.4kg

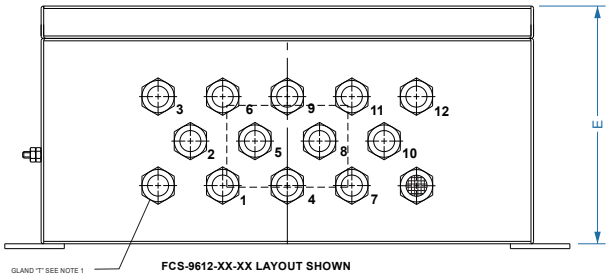
GLANDING ARRANGEMENTS



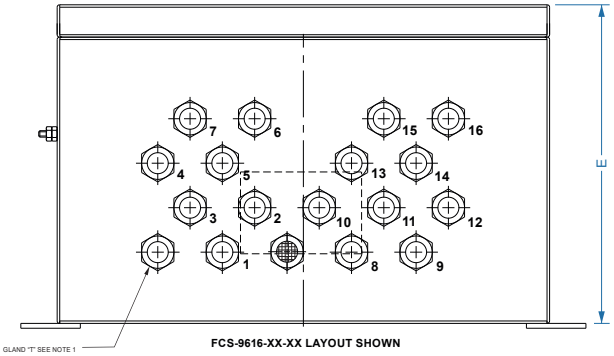
FCS-9604-XX-XX LAYOUT SHOWN



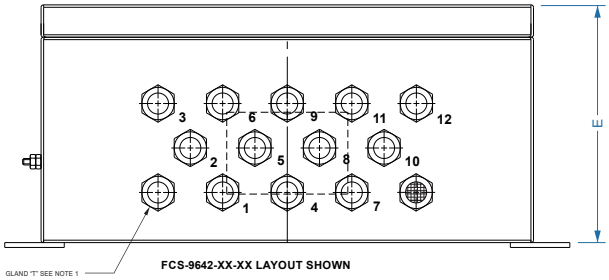
FCS-9608-XX-XX LAYOUT SHOWN



FCS-9612-XX-XX LAYOUT SHOWN



FCS-9616-XX-XX LAYOUT SHOWN

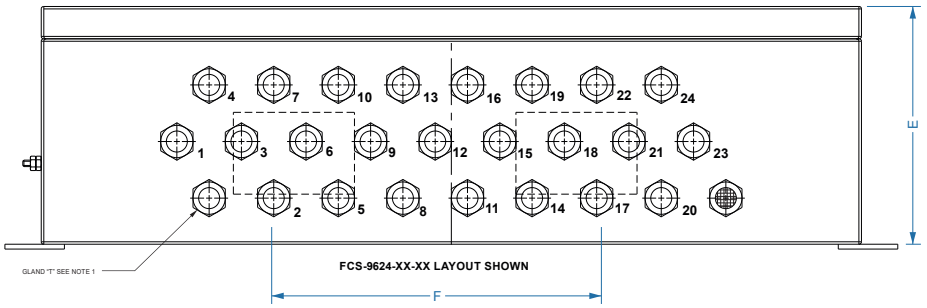


FCS-9642-XX-XX LAYOUT SHOWN

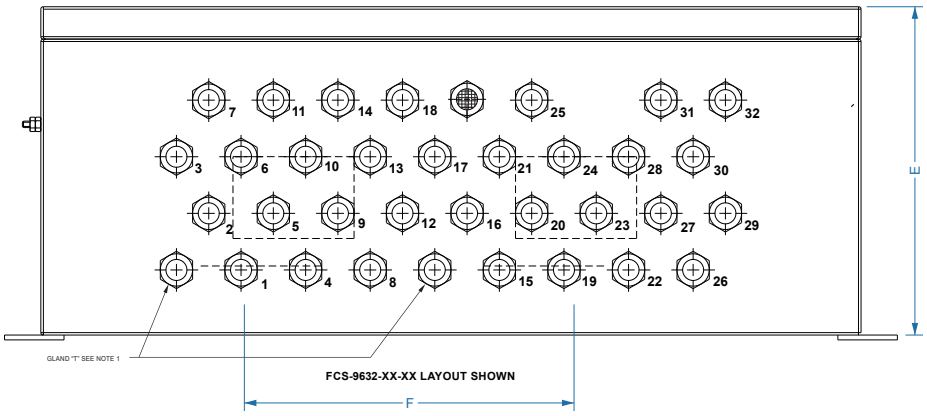
Notes:
1. Bottom left gland indicated in all layouts with letter "T" is to be fitted, with the following exceptions
i. Where glanding part no. Includes "020", no gland fitted
ii. Where glanding part no. Includes "X20", M20 brass Ex eb tb, C1D1 and C1Z1 approved stopping plug fitted.

2. For quantity of glands to be fitted, see part No. glands are to be fitted in the sequence specified on layouts above.
Where part no. indicates none are fitted, the glands are to be supplied loose.
All empty entries are to be fitted with transit plugs.

3. Unused glanding positions are to be plugged using stopping plugs manufactured frim same material as gland specified. Stopping plugs are to be M20, Ex eb tb, C1D1 and C1Z1 approved & group 2category 2 G&D certified.



FCS-9624-XX-XX LAYOUT SHOWN



FCS-9632-XX-XX LAYOUT SHOWN

APPROVALS

Region		Europe	International	N America
Authority		**Dekra**	**Dekra**	**UL**
Standard		EN 60079-0 EN60079-7 EN60079-31	IEC 60079-0 IEC 60079-7 IEC 60079-31	UL508A Industrial Control Panels CAN/CSA C22.2 No. 14-13 Industrial Control Panels
Approved for		Ⓔx II 2 G Ex e IIC Gb Ⓔx II 2 D Ex tb IIIC Db	Ex e IIC Gb Ex tb IIIC Db	
MTL Part No.	**Crouse Hinds Enclosure Part Number**	**Certificate Numbers**		
FCS-9604	XLHS12626159	Baseefa15ATEX0099U	IECEx BAS 15.0071U	20140108-E115376
FCS-9608	XLHS12626159	Baseefa15ATEX0099U	IECEx BAS 15.0071U	20140108-E115376
FCS-9612	XLHS13030150	Baseefa15ATEX0099U	IECEx BAS 15.0071U	20140108-E115376
FCS-9624	XLHX14050150	Baseefa15ATEX0099U	IECEx BAS 15.0071U	20140108-E115376
FCS-9642	XLHS14030150	Baseefa15ATEX0099U	IECEx BAS 15.0071U	20140108-E115376
FCS-9616	XLHS13030200	Baseefa15ATEX0099U	IECEx BAS 15.0071U	20140108-E115376
FCS-9632	XLHS14050200	Baseefa15ATEX0099U	IECEx BAS 15.0071U	20140108-E115376

GLAND OPTION DETAILS

Option	Description	Gland model no.	Cable size mm	Socket size mm	Temp. range	Certification
-A20	Nickel plated brass gland, for steel wired armoured cable M20 Ex d/e double silicone seal	Capri ADE 5F-CAP856695V1	10.0 – 16.0 outer diam. 7.0 – 12.0 inner diam. 0.2 – 1.2 armour	24/24	-60°C to +140°C	IECEx INE 12.0025X INERIS 12ATEX0032X
-R20	Stainless Steel Gland, for Steel Wired Armoured Cable M20 Ex d/e double silicone sea	Capri ADE 5F-CAP856696V1	10.0 – 16.0 outer diam. 7.0 – 12.0 inner diam. 0.2 – 1.2 armour	24/24	-60°C to +140°C	
-C20	Nickel plated brass gland, for un-armoured cable M20, Ex e single silicone seal	Capri ADE 1F2-CAP806695V1	7.0 – 12.0 outer diam.	19/24	-60°C to +140°C	
-S20	Stainless Steel Gland, for un-armoured cable M20, Ex e single silicone seal	Capri ADE 1F2-CAP806696V1	7.0 – 12.0 outer diam.	19/24	-60°C to +140°C	

ORDERING INFORMATION

Part No
FCS-XXXX-YYY-ZZ

Part Number	Description
FCS-9604	Fieldbus JB 4 spur outlets + trunk-in and trunk-out
FCS-9608	Fieldbus JB 8 spur outlets + trunk-in
FCS-9612	Fieldbus JB 12 spur outlets + trunk-in
FCS-9642	Fieldbus JB 12 spur outlets + Ex ic adapter + trunk-in
FCS-9624	Fieldbus JB 24 spur outlets + trunk-in
FCS-9616	Temperature multiplexer JB 16 sensor outlets + data highway (for 1 x MTL831C)
FCS-9632	Temperature multiplexer JB 32 sensor outlets + data highway (for 2 x MTL831C)

-YYY = trunk & spur glanding
-020 = Predrilled for M20 glands - none fitted
-X20 = Predrilled, with M20 brass blanking plugs
-A20 = Nickel-plated brass M20 glands for wire-armoured cable
-R20 = Stainless Steel M20 glands for wire-armoured cable
-S20 = Stainless Steel M20 glands
-C20 = Nickel-plated brass M20 glands
-ZZ = number of spur/sensor outlet glands to be fitted

A gland of the specified type is **always supplied** and fitted for the trunk-in. Any remaining holes are fitted with blanking plugs of the same material as the glands. *If this number is not specified, glands will be fitted to all outlets (including the trunk-out, if applicable).*

Example part number

FCS-9604-A20-04

An FCS-9604 junction box having 4 spur outlets, 1 trunk-in and 1 trunk-out. Supplied with nickel-plated brass M20 glands for wire-armoured cable fitted on 4 spur outlets +1 trunk-in. The trunk-out has a nickel-plated blanking plug fitted.

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