Safety Communication Fieldbus System
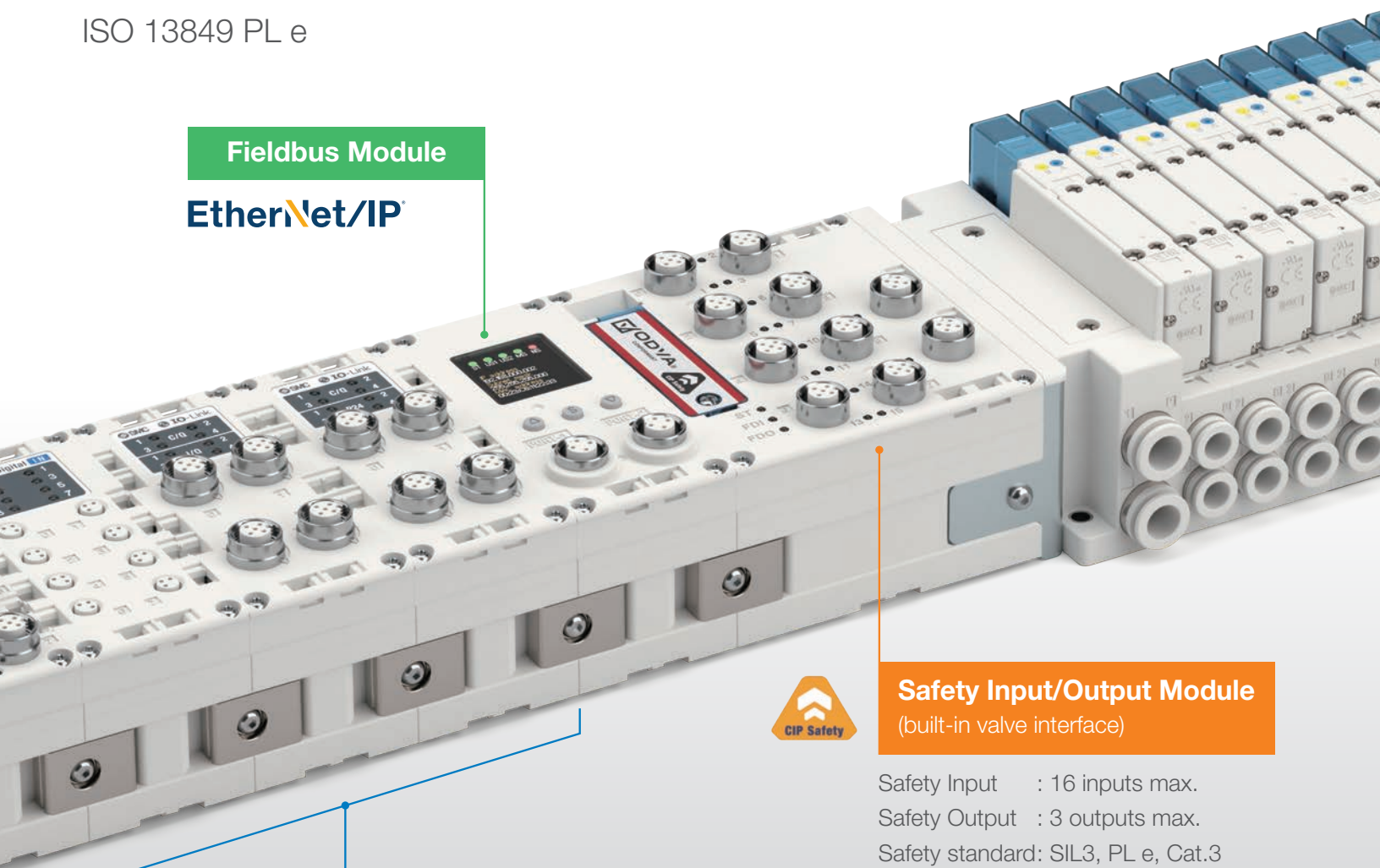
CE UK CA c**UL**us IP67 RoHS

Safety / General purpose I/O integrated into one manifold

IEC 61508/IEC 62061 SIL3

ISO 13849 PL e

Fieldbus Module

EtherNet/IP

Safety Input/Output Module
(built-in valve interface)

Safety Input   : 16 inputs max.
Safety Output   : 3 outputs max.
Safety standard: SIL3, PL e, Cat.3

General Purpose I/O Module

Digital Input/Output, IO-Link Module
Up to 9 modules can be connected (in any order)

EX600 *Series*

NB02-30A

Safety / General purpose I/O integrated into one manifold

■ Fieldbus Module EtherNet/IP®
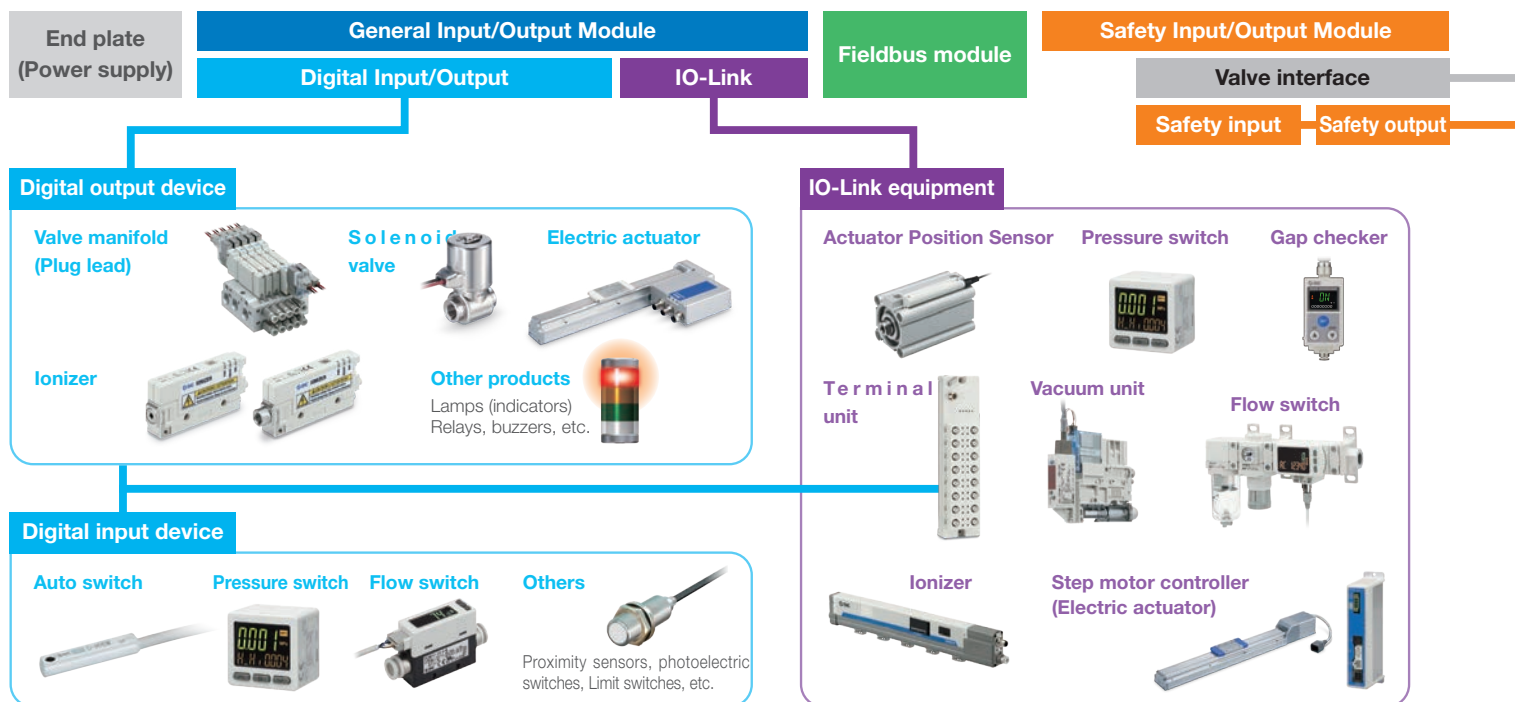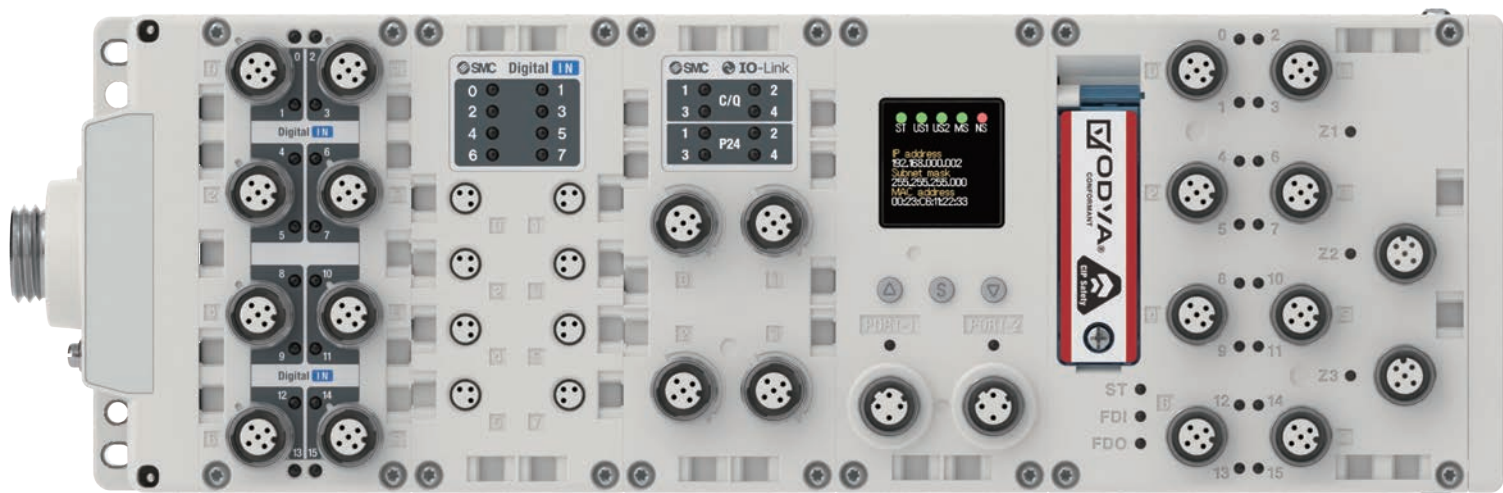
· Supports Safety communication

■ Safety Input/Output Module (built-in valve interface)

· Safety standards: IEC 61508/IEC 62061 SIL3,
ISO 13849 PL e
· Safety Input : 16 inputs max.
· Safety output : 3 outputs max. (power supply to valves and external devices)
· Valve interface : Max. number of solenoids: 32 points
: Max. number of solenoids: 128, Max. number of electro-pneumatic regulators: 4

■ General Input/Output Module

· Digital input, Digital output, IO-Link
· M8/M12 connector
· Up to 9 modules max. (in any order)

End plate (Power supply)	General Input/Output Module		Fieldbus module	Safety Input/Output Module
	Digital Input/Output	IO-Link		Valve interface
				Safety input — Safety output

Digital output device

Valve manifold (Plug lead)	Solenoid valve	Electric actuator
Ionizer	Other products	

Other products: Lamps (indicators) Relays, buzzers, etc.

IO-Link equipment

Actuator Position Sensor   Pressure switch   Gap checker

Terminal unit   Vacuum unit   Flow switch

Digital input device

Auto switch   Pressure switch   Flow switch   Others

Others: Proximity sensors, photoelectric switches, Limit switches, etc.

Ionizer   Step motor controller (Electric actuator)

SMC

1

CIP Safety™ (EtherNet/IP) is compliant with the functional safety standards IEC 61508 / IEC 62061 SIL 3 and ISO 13849-1 PL e. This product (EX600-FVC□) is designed to facilitate the safety design (compliant with ISO/IEC standards) of your devices/facilities, and has been certified by a third-party organization (TÜV SÜD) up to the safety levels of the following standards.

SIL (Safety Integrity Level)

The safety level defined by the international standard IEC 61508 / IEC 62061.
The level of safety is expressed in 4 levels, from SIL 1 to 4, with SIL 1 being the lowest and SIL 4 being the highest.

PL (Performance Level)

A scale used to specify the capabilities of safety-related parts, as defined by the international standard ISO 13849. The level of safety is expressed in 5 levels, from PL a to PL e, with PL a being the lowest and PL e being the highest safety function capability.

Electro-pneumatic regulator	Valve
	Power supply for valve

Safety Input/Output equipment

Residual pressure release valve

Safety Input Device

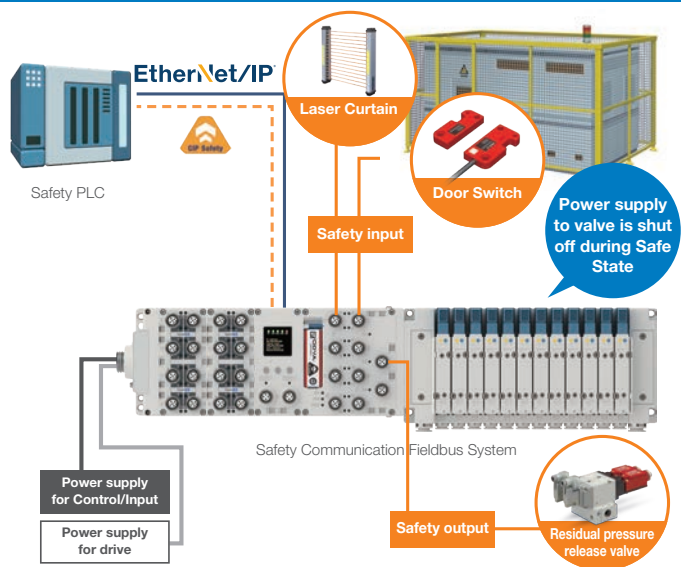| Door Switch	Laser Curtain	Laser Scanner

Examples of Safety Input connection devices (commercially available)

Example of using Safety communication compatible Fieldbus devices

EtherNet/IP™

CIP Safety

Safety PLC

Laser Curtain

Door Switch

Power supply to valve is shut off during Safe State

Safety input

Safety Communication Fieldbus System

Power supply for Control/Input

Power supply for drive

Safety output

Residual pressure release valve

Safety Output

■ Features

Safety Output (3 outputs)
By turning off the safety output according to a command from the safety PLC, the power supply to the valve and external devices is cut off and a safe state is entered.

Redundant safety switch
The safety output of this product is made redundant by two safety switches, one on the 24 V side and one on the 0 V side. Diagnostics is performed continuously, and if an abnormality is detected in the safety output, the safety switch is turned OFF and the system transitions to a safe state.
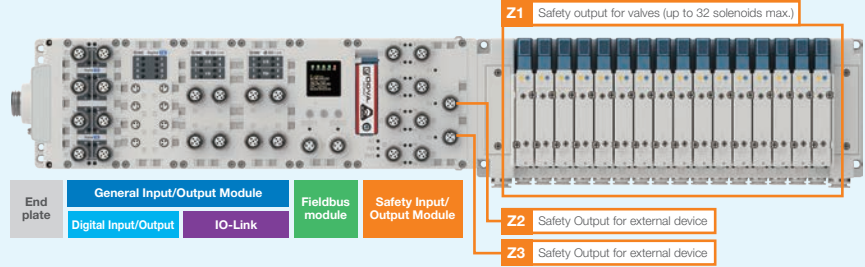
■ Variations

Model No.	Number of Safety inputs	Number of Safety outputs		Valve	
		For valves	For external devices	Max. number of solenoids	Connectable series
EX600-FV□1	16	1	2	32	JSY, SY, VQC
EX600-FV□2	16	1	2	128	JSY3000-L/P, IITV23

Safety Input

■ Features

Up to 16 Safety Input compatible devices can be connected, such as residual pressure exhaust valve and other main valve position detection devices, and laser curtains.
The safety input can be obtained in 2 ways:

Single Input (1oo1): 16 Safety Inputs (SIL2, PL d)
Dual Input (1oo2): 8 Safety Inputs (SIL3, PL e)

⚠ **Safety Input Definition**
The safe state of the EX600-FV□ is when the safety input value is sent to the upper level device (such as a safety PLC) as "0."
The safety functions and safety states of devices, including peripheral circuits, connected to this product are not within the scope of application of this product.

Block diagram

US1: Power supply for control/Input

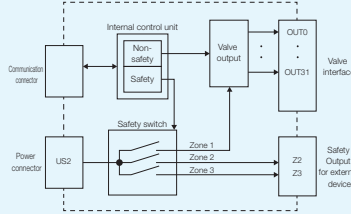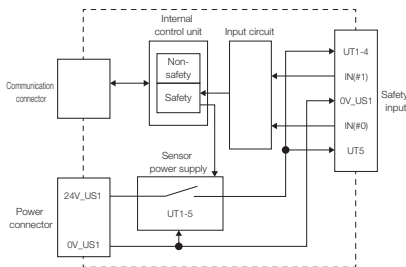## EX600-FV□1

Safety output: 1 output for valves, 2 outputs for external devices.
Maximum number of solenoids: 32 (**JSY**, **SY**, **VQC**)

Z1 Safety output for valves (up to 32 solenoids max.)
Z2 Safety Output for external device
Z3 Safety Output for external device

End plate	General Input/Output Module	Fieldbus module	Safety Input/Output Module
	Digital Input/Output IO-Link		

Block diagram

US2: Power supply for Drive

Applicable Valve Series

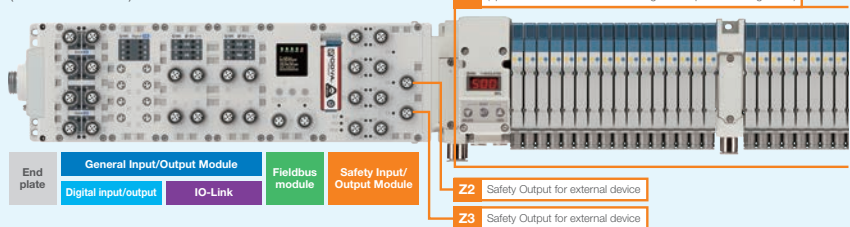| Series		Max. number of solenoids
IP67	SY3000, SY5000, SY7000	32
IP67 *1	JSY1000, JSY3000, JSY5000	32
IP67	VQC1000, VQC2000, VQC4000, VQC5000	24

*1 JSY1000 is IP40

⚠ **Safety Output Definition**
The safe state of the EX600-FV□ is a condition in which the safety output is turned OFF, to shut off the power supply to the valve manifold connected to this product. The safety functions and safety states of devices, including peripheral circuits of equipment, etc. connected to this product are not within the scope of application of this product.
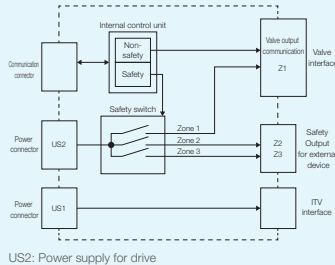
EX600-FV□2

Safety output: 1 output for valves, 2 outputs for external devices.
Max. number of solenoids: 128 points
(**JSY3000-L/P**)

Z1 Safety Output for valves (up to 128 solenoids max. excluding electro-pneumatic regulators)
Z2 Safety Output for external device
Z3 Safety Output for external device

End plate	General Input/Output Module	Fieldbus module	Safety Input/Output Module
	Digital input/output IO-Link		

Block diagram

US2: Power supply for drive

Connectable solenoid valve/electro-pneumatic regulator series

Series		Max. number of solenoids	Max. number of electro-pneumatic regulators
IP67	JSY3000-L	128	Not compatible
IP65	JSY3000-P	128	4
IP65	IITV23	Not compatible	4

* Valve specifications are the same as the JSY series