Waterproof slave (Flat type), FM6D1/FM6DB1

■ Description

The slave inclueds an upper section, which is the actual slave, and a lower section, which is the mounting plate. The IP67 structure provides excellent environmental resistance. By allowing use outside the control panel, the slave eliminates the need for relay boxes and contributes to downsizing. The slave is also flatter than conventional slaves and reduces restrictions on installation.

- The depth, including the mounting plate, is only 30mm, which is 15mm flatter than conventional models.
- The actual slave can be easily fixed to the mounting plate using one screw.
- Mounting plates are available in two types: IEC rail/screw dual mounting and exclusive screw mounting.
- Slave addressing is done by connecting an addressing unit to the front of the slave.
- LED indication of external power supply (2I/2O and 4O models only)
- Both NPN and PNP models are available.
- The slave can be easily connected to the AS-i flat cable by insulation piercing connection.
- The FM6D1-40XX□CM can be mounted side-by side together with output slaves having 2 input/2 outputs or 4 outputs.
- Short-circuit protection is provided for the sensor power supply and output circuit.
- Actuators and sensors can be easily connected by single-action M12 connectors (IEC60947-5-2).
- Two outputs or inputs per M12 connector.
- Conforms to EC Directive
  ENC Directive (No. 89/336/EEC); EN50081-1, EN61000-6-2 (EN50082-2).
- AS-i specification: V2.0, V2.1


KKD05-248


KKD05-242


KKD05-244

Actual slave

FM6D1-40XXN **FM6D1-04TPX** **FM6D1-40XXNCM**


KKD05-246

FM6DB1-40XXN


AF01-78

Mounting plate

FM6B1-04FK

■ Ratings and specifications

Type (actual slave)	NPN model		**FM6D1-40XXN** **FM6D1-40XXNCM**	**FM6D1-04TNX**	**FM6D1-22TNN**
	PNP model		**FM6D1-40XXP** **FM6D1-40XXPCM**	**FM6D1-04TPX**	**FM6D1-22TPP**
Slave type			Standard slave		
Number of inputs/outputs			4 inputs	4 outputs	2 inputs/2 outputs
Applicable mounting plate			**FM6B □ -04FK**	**FM6B □ -04FE**	
AS-Interface profile (I/O, ID)			0, 1	8, 1	3, 1
Operating voltage (in accordance with AS-i specification)			26.5 to 31.6V DC		
Current consumption	Slave only		45mA DC or less	45mA DC or less	45mA DC or less
	Including sensors		245mA DC or less	—	245mA DC or less
LED indication G: Green R: Red Y: Yellow	AS-i (G/R)		G on: Normal operation, R on: Communication error, R on and Orange (G+R) on alternating: Slave has address = 0, R flashing: Input power overload, Off: AS-i power off		
	EXT POWER (G)		—	On/off: 24V DC external power on/off	
	IN1 to IN4 (or 2) (Y)		On/off: Input on/off	—	On/off: Input on/off
	OUT1 (or 3) to OUT4 (Y)		—	On/off: Output on/off	On/off: Output on/off
Input	NPN	On voltage (Power supply (+) - Input)	10V or more	—	10V or more
		Off voltage (Power supply (+) - Input)	6V or less	—	6V or less
		On current (sorurce)	Approx. 5mA	—	Approx. 5mA
		Off current	1.5mA or less	—	1.5mA or less
	PNP	On voltage (Power supply (-) - Input)	10V or more	—	10V or more
		Off voitage (Power supply (-) - Input)	6V or less	—	6V or less
		On current (sink)	Approx. 5mA	—	Approx. 5mA
		Off current	1.5mA or less	—	1.5mA or less
Sensor power supply via AS-i cable	Short-circuit and overload protection		Built-in	—	Built-in
	Sensor voltage range		20 to 27V (I ≦ 160mA)	—	20 to 27V (I ≦ 160mA)
			18 to 27V (I ≦ 200mA)		18 to 27V (I ≦ 200mA)
	Current carrying capacity for all inputs *		200mA (Ta ≦ 25˚C)	—	200mA (Ta ≦ 25˚C)
			160mA (Ta = 45˚C)		160mA (Ta = 45˚C)
			80mA (Ta = 80˚C)		80mA (Ta = 80˚C)
Output (per point)	External power supply 24V DC		—	Via black AS-i flat cable	Via black AS-i flat cable
	Operating voltage range		—	20 to 30V DC	20 to 30V DC
	NPN model		—	NPN transistor	NPN transistor
	PNP model		—	PNP transistor	PNP transistor
	Current carrying capacity per point		—	Approx. 1A	Approx. 1A
	Voltage drop		—	0.8V or less	0.8V or less
	Short-circuit protection		—	Built-in	Built-in
	Inductive surge protection		—	Built-in	Built-in
	Output status on communication error		—	Off	Off
Degree of protection (IEC60529)			IP67 (with M12 connectors, slave mounting plate and AS-i cable)		
Rated temperature Operating temperature Storage temperature			25˚C –25 to +85˚C (no icing or no condensation) –25 to +85˚C (no icing or no condensation)		
Supply method of external power			—	Via mounting plate	
Electrical protection for AS-i connection	Reverse polarity protection		Built-in		
	Electrostatic discharge resistance		Contact discharge method: ±4kV Aerial discharge method: ±8kV, IEC 61000-4-2 (Class B)		
	Electromagnetic field noise immunity		80MHz to 1000MHz, Electric field strength: 10V/m, IEC 61000-4-3 (Class A)		
	Burst noise		2kV (Class B)/1kV (Class A), IEC 61000-4-4		
Vibration resistance	Rail mounting (IEC 68-2-6)		10 to 55Hz, 0.5mm one-way amplitude		
	Screw mounting (IEC 68-2-6)		10 to 55Hz, 1mm one-way amplitude		
Shock resistance	Rail mounting (IEC 68-2-27)		150m/s^2 (11ms)		
	Screw mounting (IEC 68-2-27)		300m/s^2 (18ms)		
CE marking	Low Voltage Directive (No.: 73/23/EEC)		—		
	EMC Directive (No.: 89/336/EEC)		EN50081-1, EN61000-6-2 (EN50082-2)		
Mass			Approx. 115g (including mounting plate, approx. 35g, sold separately)		
Addressing method (Addresses: between 1 and 31)			Can be done with an addressing unit (FL1HA-E) via an addressing cable (FX9Y002) connected to the addressing jack on the front of the slave. Connecting the addressing cable to a slave will disconnect the slave from the AS-i connection.		
Approval			CE		

Note: * If a sensor with power consumption of more than 200mA is connected to the sensor power supply of the slave, the overload and short-circuit protective function will operate and the sensor power supply will be stopped even when 0.5ms has passed after the inrush current is generated. If a connected sensor has a high inrush current, make sure that current consumption with a lapse of 0.5 ms after the inrush current is 200 mA or less.

■ Ratings and specifications

Type (actual slave)	NPN model PNP model		**FM6DB1-40XXN** **FM6DB1-40XXP**	**FM6DB1-03TNX** **FM6DB1-03TPX**
Slave type			A/B slave	
Number of inputs/outputs			4 inputs	3 outputs
AS-Interface profile (I/O, ID, ID2) [*1]			0, A, 2	8, A, 2
Operating voltage (in accordance with AS-i specification)			26.5 to 31.6V DC	
Current consumption	Slave only Including sensors		45mA DC or less 245mA DC or less	45mA DC or less —
LED indication G: Green R: Red Y: Yellow	AS-i (G/R)		G on: Normal operation, R on: Communication error, R on and Orange (G+R) on alternating: Slave has address = 0, R flashing: Input power overload, Off: AS-i power off	
	EXT POWER (G)		—	On/off: 24V DC external power on/off
	IN1 to IN4 (Y) OUT1 to OUT3 (Y)		On/off: Input on/off —	— On/off: Output on/off
Input	NPN	On voltage (Power supply (+) - Input) Off voltage (Power supply (+) - Input) On current (sorurce) Off current	10V or more 6V or less Approx. 5mA 1.5mA or less	— — — —
	PNP	On voltage (Power supply (+) - Input) Off voltage (Power supply (+) - Input) On current (sink) Off current	10V or more 6V or less Approx. 5mA 1.5mA or less	— — — —
Sensor power supply via AS-i cable	Short-circuit and overload protection Sensor voltage range Current carrying capacity for all inputs [*2]		Built-in 20 to 27V (I ≦ 160mA) 18 to 27V (I ≦ 200mA) 200mA (Ta ≦ 25˚C) 160mA (Ta = 45˚C) 130mA (Ta = 60˚C)	— — —
Output (per point)	External power supply 24V DC Oprating voltage range NPN model PNP model Current carrying capacity per point Residual voltage Short-circuit protection Inductive surge protection Output status on communication error		— — — — — — — — —	Via black AS-i flat cable 20 to 30V DC NPN transistor PNP transistor Approx. 1A 0.8V or less Built-in Built-in Off
Degree of protection (IEC60529)			IP67 (with M12 connectors, slave mounting plate and AS-i cable, sold separately)	
Rated temperature Operating temperature Storage temperature			25˚C –25 to +60˚C (no icing or no condensation) –25 to +85˚C (no icing or no condensation)	
Supply method of external power			—	Via mounting plate
Electrical protection for AS-i connection	Reverse polarity protection		Built-in	
	Electrostatic discharge resistance		Contact discharge method: ±4kV Aerial discharge method: ±8kV, IEC 61000-4-2 (Class B)	
	Electromagnetic field noise immunity		80MHz to 1000MHz, Electric field strength: 10V/m, IEC61000-4-3 (Class A)	
	Burst noise		2kV (Class B)/1kV (Class A), IEC 61000-4-4	
Vibration resistance	Rail mounting (IEC 68-2-6) Screw mounting (IEC 68-2-6)		10 to 55Hz, 0.5mm one-way amplitude 10 to 55Hz, 1mm one-way amplitude	
Shock resistance	Rail mounting (IEC 68-2-27) Screw mounting (IEC 68-2-27)		150m/s^2 (18ms) 300m/s^2 (11ms)	
Mass			Approx. 115g (including mounting plate, approx. 35g, sold separately)	
Addressing method (Addresses: between 1A (1B) and 31A (31B))			Can be done with an addressing unit (FL1HA-E) via an addressing cable (FX9Y002) connected to the addressing jack on the front of the slave. Connecting the addressing cable to a slave will disconnect the slave from the AS-i connection.	

Notes: [*1] The initial value of ID1 is 7 (variable from 0 to 7).

[*2] If a sensor with power consumption of more than 200mA is connected to the sensor power supply of the slave, the overload and short-circuit protective function will operate and the sensor power supply will be stopped even when 0.5ms has passed after the inrush current is generated. If a connected sensor has a high inrush current, make sure that current consumption with a lapse of 0.5 ms after the inrush current is 200 mA or less.

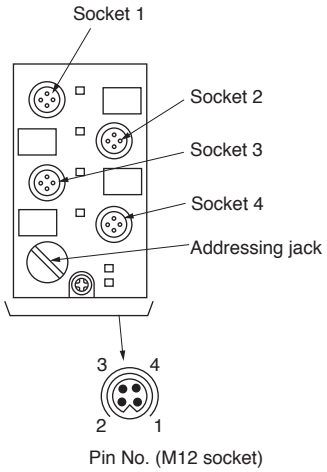
■ Connector pin assignment

NPN model

	Pin No.	FM6D1-40XXN, 40XXNCM FM6DB1-40XXN	FM6D1-04TNX	FM6DB1-03TNX	FM6D1-22TNN	Logic assignment
Socket 1	1	Sensor power supply (+)	External power supply +24V DC	External power supply +24V DC	Sensor power supply (+)	
	2	Signal input 2 (source)	Switch output 2 (sink)	Switch output 2 (sink)	Signal input 2 (source)	Data bit D1
	3	Sensor power supply (–)	Not connected	Not connected	Sensor power supply (–)	
	4	Signal input 1 (source)	Switch output 1 (sink)	Switch output 1 (sink)	Signal input 1 (source)	Data bit D0
Socket 2	1	Sensor power supply (+)	External power supply +24V DC	External power supply +24V DC	Sensor power supply (+)	
	2	Not connected	Not connected	Not connected	Not connected	
	3	Sensor power supply (–)	Not connected	Not connected	Sensor power supply (–)	
	4	Signal input 2 (source)	Switch output 2 (sink)	Switch output 2 (sink)	Signal input 2 (source)	Data bit D1
Socket 3	1	Sensor power supply (+)	External power supply +24V DC	External power supply +24V DC	External power supply +24V DC	
	2	Signal input 4 (source)	Switch output 4 (sink)	Not connected	Switch output 4 (sink)	Data bit D3
	3	Sensor power supply (–)	Not connected	Not connected	Not connected	
	4	Signal input 3 (source)	Switch output 3 (sink)	Switch output 3 (sink)	Switch output 3 (sink)	Data bit D2
Socket 4	1	Sensor power supply (+)	External power supply +24V DC	–	External power supply +24V DC	
	2	Not connected	Not connected		Not connected	
	3	Sensor power supply (–)	Not connected		Not connected	
	4	Signal input 4 (source)	Switch output 4 (sink)		Switch output 4 (sink)	Data bit D3

PNP model

	Pin No.	FM6D1-40XXP, 40XXPCM FM6DB1-40XXP	FM6D1-04TPX	FM6DB1-03TPX	FM6D1-22TPP	Logic assignment
Socket 1	1	Sensor power supply (+)	Not connected	Not connected	Sensor power supply (+)	
	2	Signal input 2 (sink)	Switch output 2 (source)	Switch output 2 (source)	Signal input 2 (sink)	Data bit D1
	3	Sensor power supply (–)	External power supply 0V	External power supply 0V	Sensor power supply (–)	
	4	Signal input 1 (sink)	Switch output 1 (source)	Switch output 1 (source)	Signal input 1 (sink)	Data bit D0
Socket 2	1	Sensor power supply (+)	Not connected	Not connected	Sensor power supply (+)	
	2	Not connected	Not connected	Not connected	Not connected	
	3	Sensor power supply (–)	External power supply 0V	External power supply 0V	Sensor power supply (–)	
	4	Signal input 2 (sink)	Switch output 2 (source)	Switch output 2 (source)	Signal input 2 (sink)	Data bit D1
Socket 3	1	Sensor power supply (+)	Not connected	Not connected	Not connected	
	2	Signal input 4 (sink)	Switch output 4 (source)	Not connected	Switch output 4 (source)	Data bit D3
	3	Sensor power supply (–)	External power supply 0V	External power supply 0V	External power supply 0V	
	4	Signal input 3 (sink)	witch output 3 (source)	witch output 3 (source)	Switch output 3 (source)	Data bit D2
Socket 4	1	Sensor power supply (+)	Not connected	–	Not connected	
	2	Not connected	Not connected		Not connected	
	3	Sensor power supply (–)	External power supply 0V		External power supply 0V	
	4	Signal input 4 (sink)	Switch output 4 (source)		Switch output 4 (source)	Data bit D3

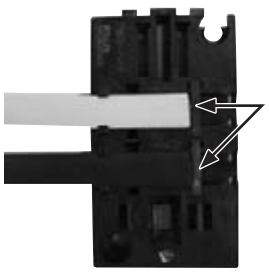


Pin No. (M12 socket)

■ Termination of AS-i cable

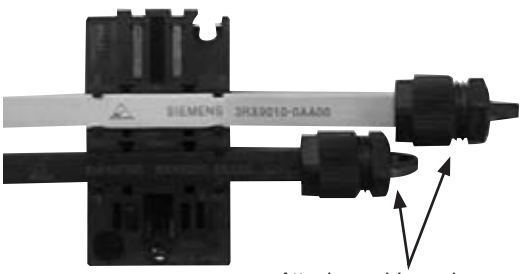
- No terminating resistors are required
- Perform any of the following actions to prevent live parts from being exposed.

Where waterproof is not required



The supplied rubber spacer is not water-resistant.

Where waterproof is required (IP65, IP67, etc.)



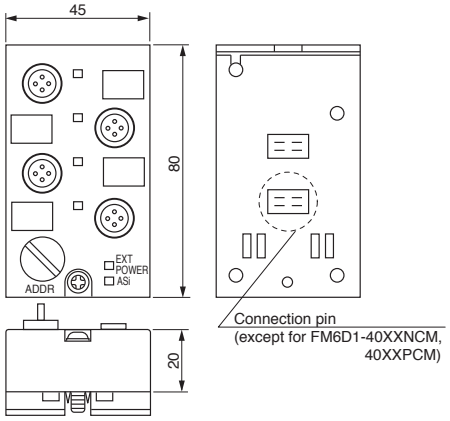
■ Precautions on wiring

- Care should be taken to avoid mis-wiring like reverse-wiring with regard to connection to external power supply (24V DC).Products might be damaged or burnt out.

■ Dimensions, mm

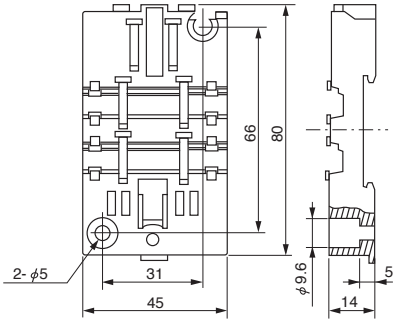
Actual slave

FM6D1-40XXN, 40XXNCM, 40XXP, 40XXPCM
FM6D1-04TNX, 04TPX, 22TNN, 22TPP
FM6DB1-40XXN, 40XXP, 03TNX, 03TPX

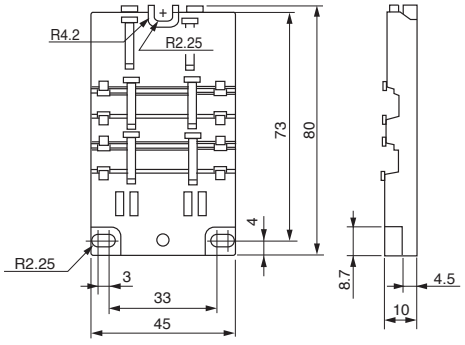


Mounting plate

Rail/screw dual mounting type
FM6B1-04FK, 04FE



Exclusive screw mounting type
FM6B2-04FK, 04FE



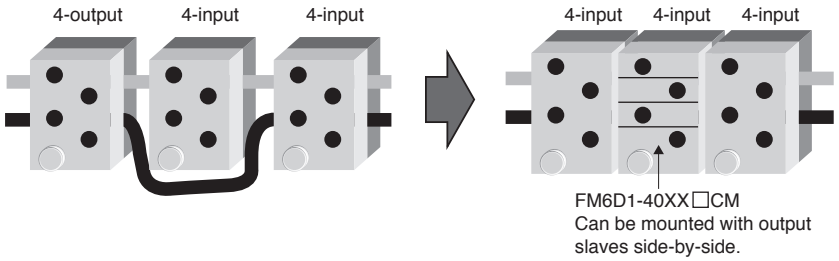
■ Mounting plate (sold separately)

Type (slave mounting plate)	Rail/screw dual mounting type	**FM6B1-04FK**	**FM6B1-04FE**
	Screw mounting type	**FM6B2-04FK**	**FM6B2-04FE**
Applicable actual slave	NPN model	**FM6D1-40XXN, 40XXNCM, FM6DB1-40XXN**	**FM6D1-04TNX, 22TNN, FM6DB1-03TNX**
	PNP model	**FM6D1-40XXP, 40XXPCM, FM6DB1-40XXP**	**FM6D1-04TPX, 22TPP, FM6DB1-03TPX**
Degree of protection (IEC 60529)		IP67	
Rated temperature		25°C	
Operating temperature range		–25 to +85°C (no icing or condensation)	
Storage temperature range		–40 to +85°C (no icing or condensation)	
Mass		Approx. 35g	

■ Advantage of side-by-side installation

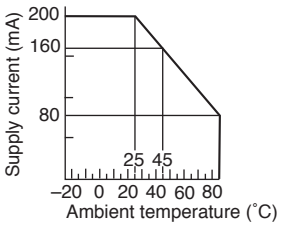
Although FM6D1-40XX ☐ or FM6DB1-40XX ☐ 4-input type has a great advantage of communication cable branching, side-by-side mounting is not possible where input slaves and output slaves are positioned alternatively.

Type FM&D1-40XX ☐ CM, being capable of side-by-side mounting, helps reduce mounting space.
With abundant lineups, both branch connection and side-by-side mounting are allowed in our AS-i slaves.

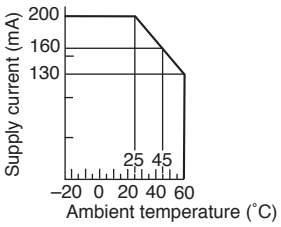


■ Current carrying capacity for all inputs (per slave)

• Standard slave

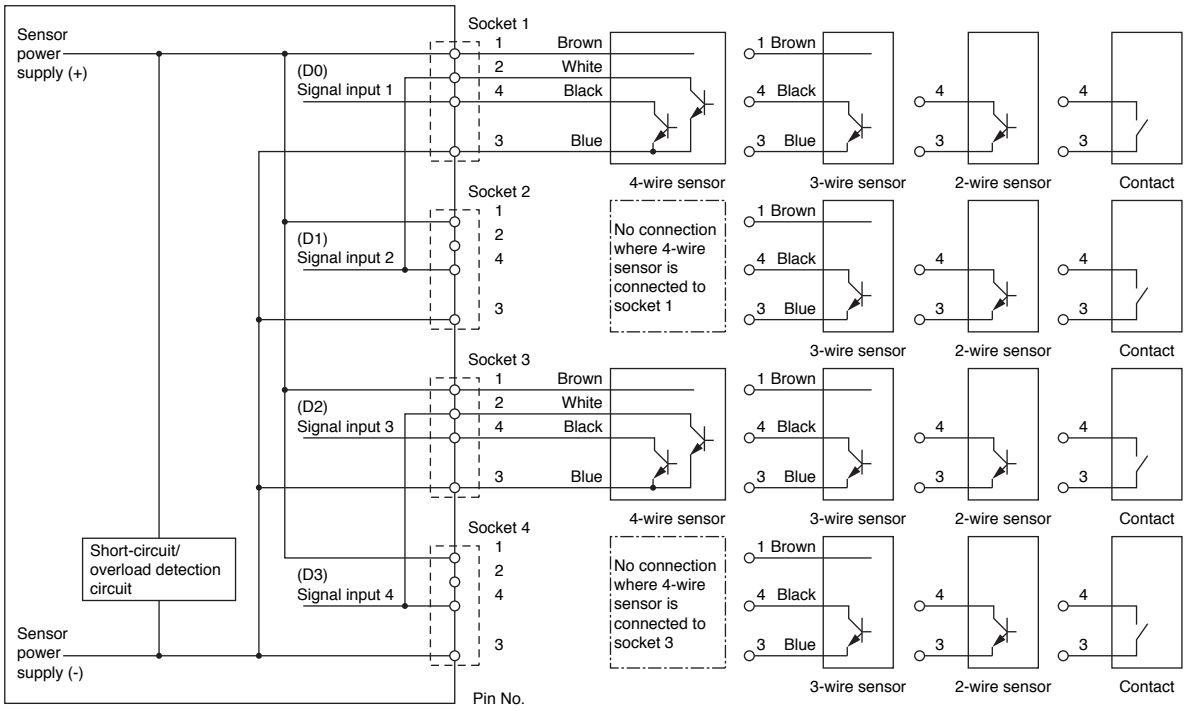


•A/B slave

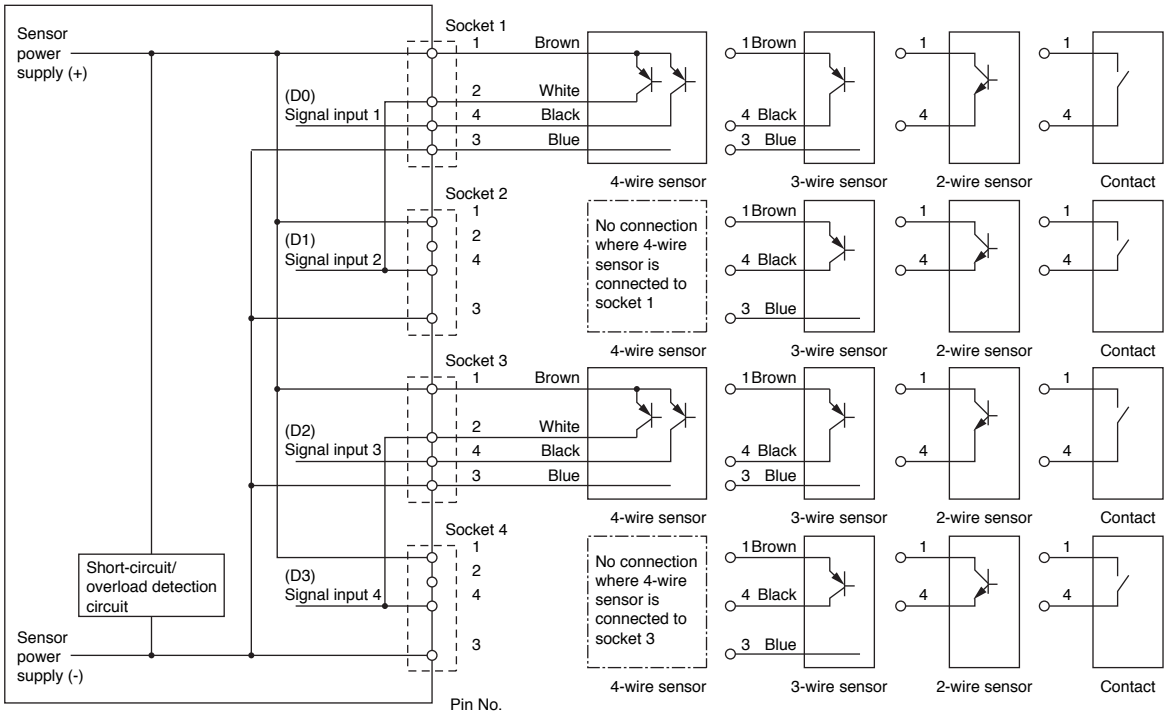


■ Wiring diagrams

FM6D1-40XXN, -40XXNCM, FM6DB1-40XXN

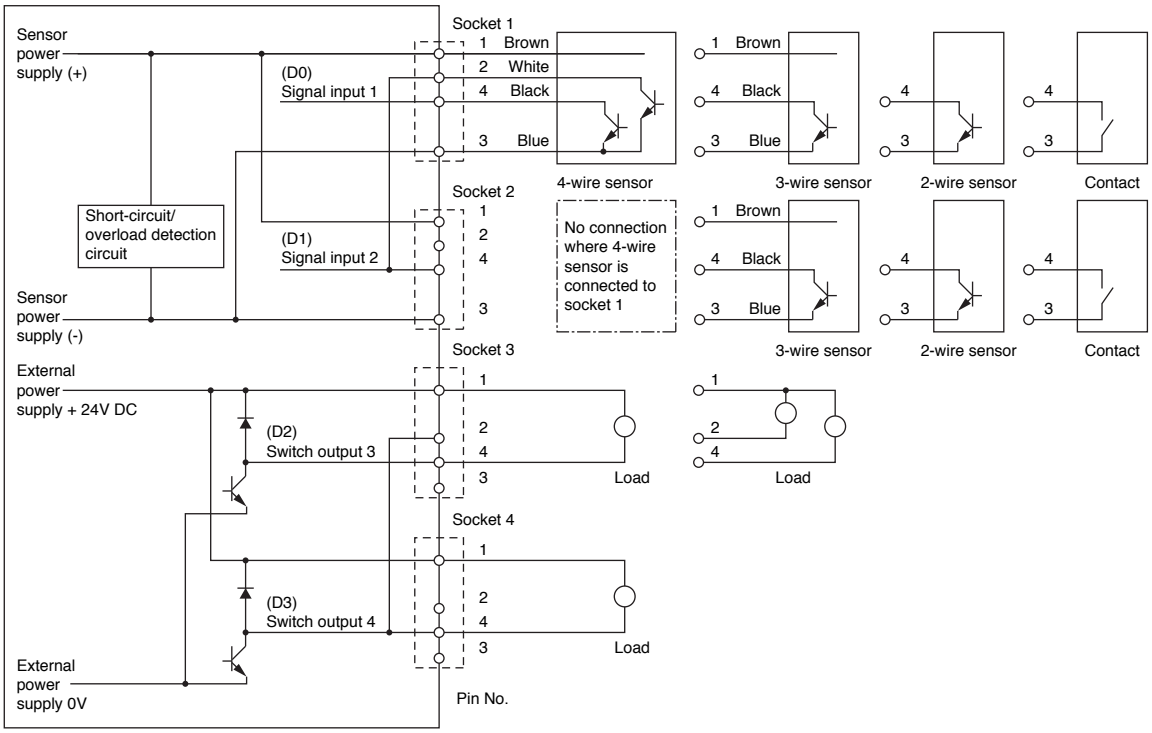


FM6D1-40XXP, -40XXPCM, FM6DB1-40XXP

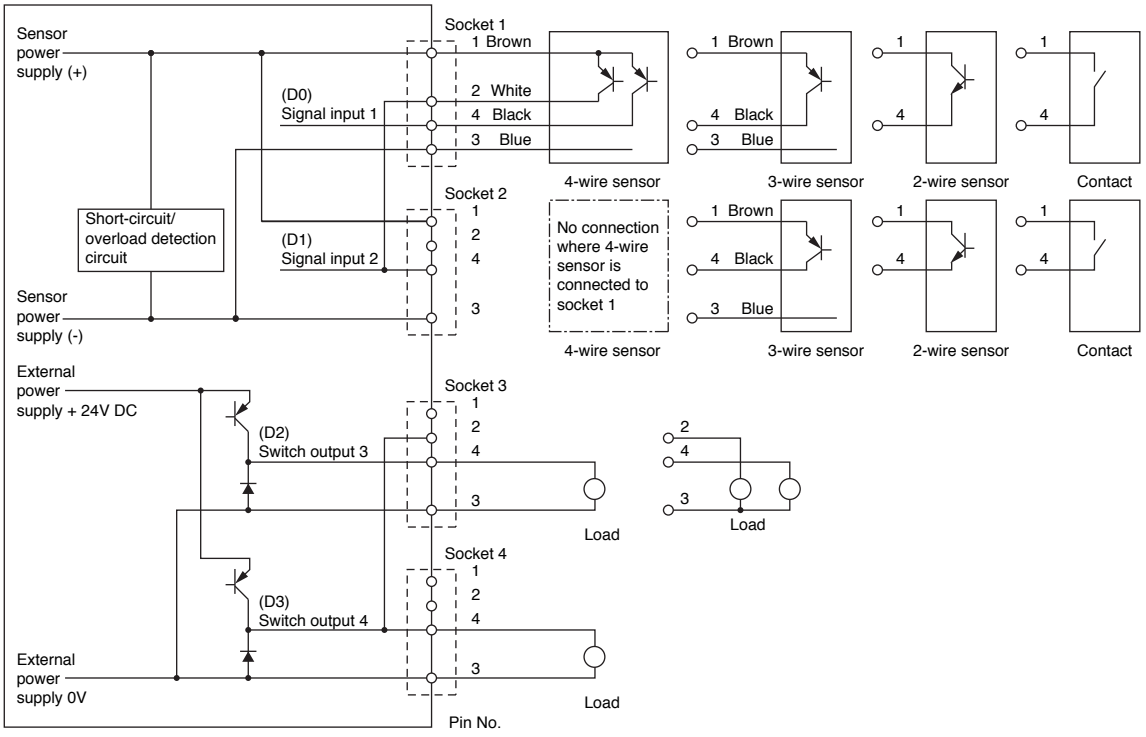


■ Wiring diagrams

FM6D1-22TNN

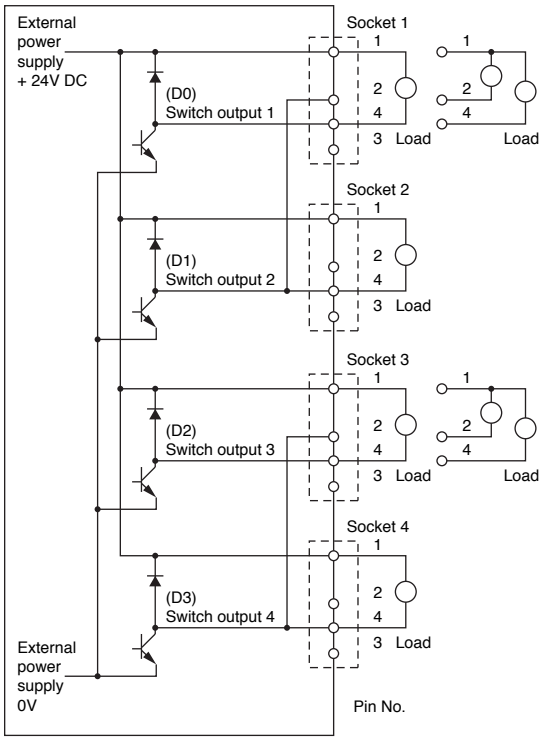


FM6D1-22TP

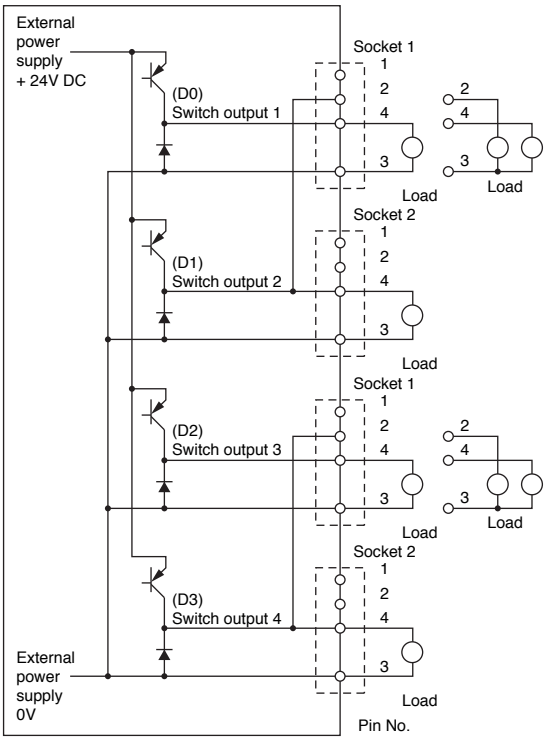


■ Wiring diagrams

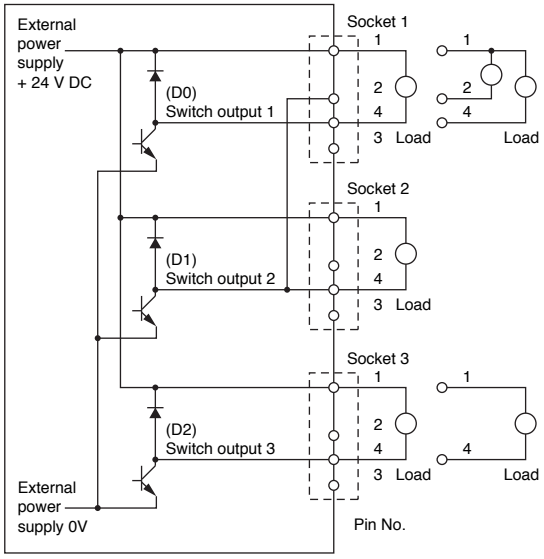
FM6D1-04TNX



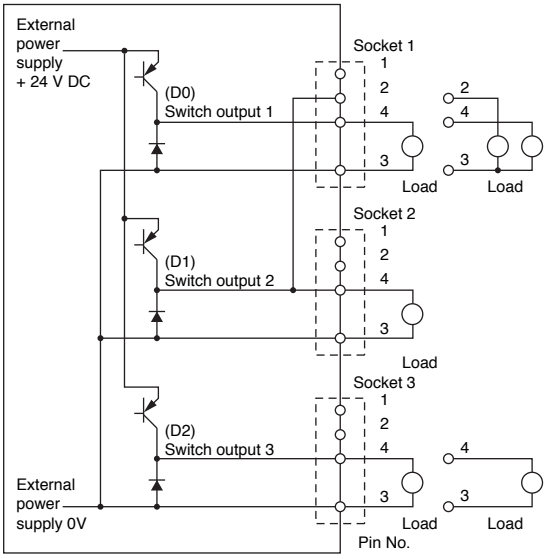
FM6D1-04TPX



FM6DB1-03TNX



FM6DB1-03TPX



Waterproof slave (Slim type), FM6D2 (Standard slave)

■ Description

The IP67 structure provides excellent environmental resistance. By allowing use outside the control panel, the FM6D2 eliminates the need for a relay box and contributes to downsizing. The FM6D2 is also more compact than conventional slaves and reduces restrictions on installation.

- Actuators and sensors can be easily connected by single-action M8 connectors (IEC 60947-5-2).
  The depth is only 30mm, which is 15mm thinner than conventional models, and the width is 25mm, which is 20mm slimmer than conventional models.
- Screw mounting in both vertical and horizontal directions.
- Short-circuit protection is provided for the sensor power supply and output circuit.
- Conforms to EC Directive
  EMC Directive (No. 89/336/EEC); EN50081-1, EN61000-6-2 (EN50082-2).
- AS-i specification: V2.0


AF01-81

FM6D2-40XXN


AF01-80

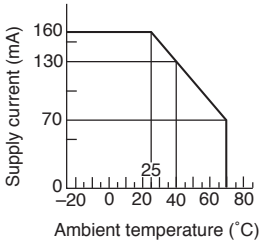
FM6D2-04TNX

■ Ratings and specifications

Type	NPN model PNP model		**FM6D2-40XXN** **FM6D2-40XXP**	**FM6D2-04TNX** **FM6D2-04TPX**	**FM6D2-22TNN** **FM6D2-22TPP**
Slave type			Standard slave		
Number of inputs/outputs			4 inputs	4 outputs	2 inputs/2 outputs
AS-Interface profile (I/O, ID)			0, 0	8, 0	3, 0
Operating voltage (in accordance. with AS-i specification)			26.5 to 31.6V DC		
Current consumption	Slave only Including sensors		45mA DC or less 205mA DC or less	45mA DC or less —	45mA DC or less 205mA DC or less
LED indication G: Green R: Red Y: Yellow	AS-i (G/R)		G on: Normal operation, R on: Communication error, R on and Orange (G+R) on alternating: Slave has address = 0, R flashing: Input power overload, Off: AS-i power off		
	EXT POWER (G)		—	On/off: 24V DC external power on/off	
	IN1 to IN4 (or 2) (Y)		On/off: Input on/off	—	On/off: Input on/off
	OUT1 to OUT4 (or 2) (Y)		—	On/off: Output on/off	On/off: Output on/off
Input	NPN	On voltage (power supply (+) - Input) Off voltage (power supply (+) - Input) On current (sorurce) Off current	10V or more 6V or less Approx. 5mA 1.5mA or less	— — — —	10V or more 6V or less Approx. 5mA 1.5mA or less
	PNP	On voltage (power supply (+) - Input) Off voltage (power supply (+) - Input) On current (sink) Off current	10V or more 6V or less Approx. 5mA 1.5mA or less	— — — —	10V or more 6V or less Approx. 5mA 1.5mA or less
Sensor power supply via black AS-i cable	Short-circuit and overload protection Sensor voltage range Current carrying capacity for all inputs *		Built-in 20 to 27V (I ≦ 160mA) 160mA (Ta ≦ 25˚C) 130mA (Ta = 40˚C) 70mA (Ta = 70˚C)	— — —	Built-in 20 to 27V (I ≦ 160mA) 160mA (Ta ≦ 25˚C) 130mA (Ta = 40˚C) 70mA (Ta = 70˚C)
Output	External power supply 24V DC		—	Via M12 connector	
	Range of operating voltage		—	20 to 30V DC	
	NPN model PNP model		— —	NPN transistor PNP transistor	
	Current carrying capacity, per point Voltage drop Short-circuit protection Inductive surge protection Output status on communication error		— — — — —	Approx. 0.5A 0.8V or less Built-in Built-in Off	Approx. 0.5A 0.8V or less Built-in Built-in Off
Degree of protection (IEC 60529)			IP67 (with M12 and M8 connectors)		
Rated temperature			25˚C		
Operating temperature			–25 to +70˚C (no icing or no condensation)		
Storage temperature			–25 to +85˚C (no icing or no condensation)		
Supply method of external power			—	Supplied by M12 socket	
Electrical protection for AS-i connection	Reverse polarity protection		Built-in		
	Electrostatic discharge resistance		Contact discharge method: ±4kV, Aerial discharge method: ±8kV, IEC61000-4-2 (Class B)		
	Electromagnetic field noise immunity		80 to 1000MHz, Electric field strength: 10V/m, IEC61000-4-3 (Class A)		
	Burst noise		2kV (Class B)/1kV (Class A), IEC61000-4-4		
Vibration resistance	Screw mounting (IEC 68-2-6)		10 to 55Hz, 1mm one-way amplitude		
Shock resistance	Screw mounting (IEC 68-2-27)		300m/s^2 (18ms)		
CE marking	Low Voltage Directive (No.: 73/23/EEC) EMC Directive (No.: 89/336/EEC)		— EN50081-1, EN61000-6-2 (EN50082-2)		
Mounting method			Screw mounting		
Mass			Approx. 70g		
Addressing method			15 times, After the 15th address, the slave keeps the last address (in accordance with slave ASIC (SAP4.0) specifications).		
Approval			CE		

Note: * If a sensor with power consumption of more than 200mA is connected to the sensor power supply of the slave, the overload and short-circuit protective function will operate and the sensor power supply will be stopped even when 0.5ms has passed after the inrush current is generated. If a connected sensor has a high inrush current, make sure that current consumption with a lapse of 0.5 ms after the inrush current is 200 mA or less.

Current carrying capacity for all inputs



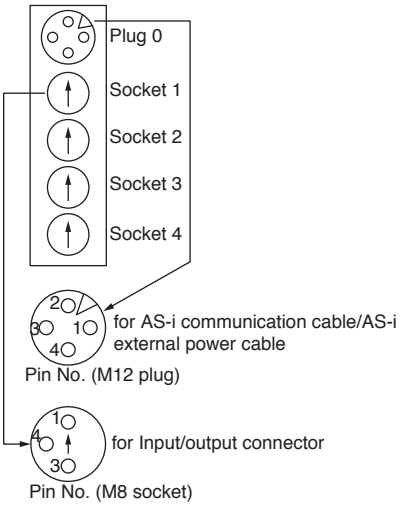
■ Connector pin assignment

NPN model

	Pin No.	FM6D2-40XXN	FM6D2-04TNX	FM6D2-22TNN	Logic assignment
Socket 0	1	AS-i (+)	AS-i (+)	AS-i (+)	
	2	Not connected	External power supply 0V	External power supply 0V	
	3	AS-i (–)	AS-i (–)	AS-i (–)	
	4	Not connected	External power supply +24V DC	External power supply +24V DC	
Socket 1	1	Sensor power supply (+)	External power supply +24V DC	Sensor power supply (+)	
	3	Sensor power supply (–)	Not connected	Sensor power supply (–)	
	4	Signal input 1 (source)	Switch output 1 (sink)	Signal input 1 (source)	Data bit D0
Socket 2	1	Sensor power supply (+)	External power supply +24V DC	Sensor power supply (+)	
	3	Sensor power supply (–)	Not connected	Sensor power supply (–)	
	4	Signal input 2 (source)	Switch output 2 (sink)	Signal input 2 (source)	Data bit D1
Socket 3	1	Sensor power supply (+)	External power supply +24V DC	External power supply +24V DC	
	3	Sensor power supply (–)	Not connected	Not connected	
	4	Signal input 3 (source)	Switch output 3 (sink)	Switch output 3 (sink)	Data bit D2
Socket 4	1	Sensor power supply (+)	External power supply +24V DC	External power supply +24V DC	
	3	Sensor power supply (–)	Not connected	Not connected	
	4	Signal input 4 (source)	Switch output 4 (sink)	Switch output 4 (sink)	Data bit D3

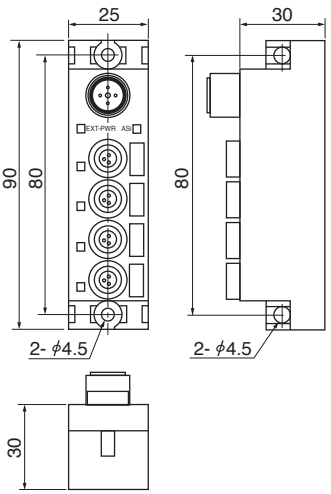
PNP model

	Pin No.	FM6D2-40XXP	FM6D2-04TPX	FM6D2-22TPP	Logic assignment
Socket 0	1	AS-i (+)	AS-i (+)	AS-i (+)	
	2	Not connected	External power supply 0V	External power supply 0V	
	3	AS-i (–)	AS-i (–)	AS-i (–)	
	4	Not connected	External power supply +24V DC	External power supply +24V DC	
Socket 1	1	Sensor power supply (+)	Not connected	Sensor power supply (+)	
	3	Sensor power supply (–)	External power supply 0V	Sensor power supply (–)	
	4	Signal input 1 (sink)	Switch output 1 (source)	Signal input 1 (sink)	Data bit D0
Socket 2	1	Sensor power supply (+)	Not connected	Sensor power supply (+)	
	3	Sensor power supply (–)	External power supply 0V	Sensor power supply (–)	
	4	Signal input 2 (sink)	Switch output 2 (source)	Signal input 2 (sink)	Data bit D1
Socket 3	1	Sensor power supply (+)	Not connected	Not connected	
	3	Sensor power supply (–)	External power supply 0V	External power supply 0V	
	4	Signal input 3 (sink)	Switch output 3 (source)	Switch output 3 (source)	Data bit D2
Socket 4	1	Sensor power supply (+)	Not connected	Not connected	
	3	Sensor power supply (–)	External power supply 0V	External power supply 0V	
	4	Signal input 4 (sink)	Switch output 4 (source)	Switch output 4 (source)	Data bit D3



■ Dimensions, mm

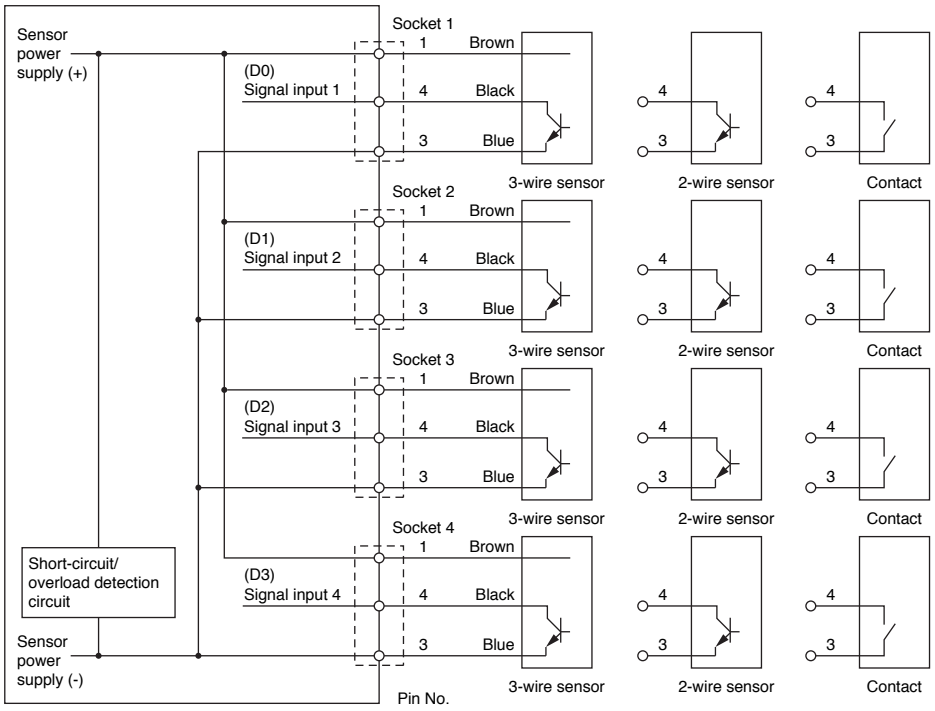
FM6D2-40XXN, 04TNX, 22TNN
FM6D2-40XXP, 04TPX, 22TPP



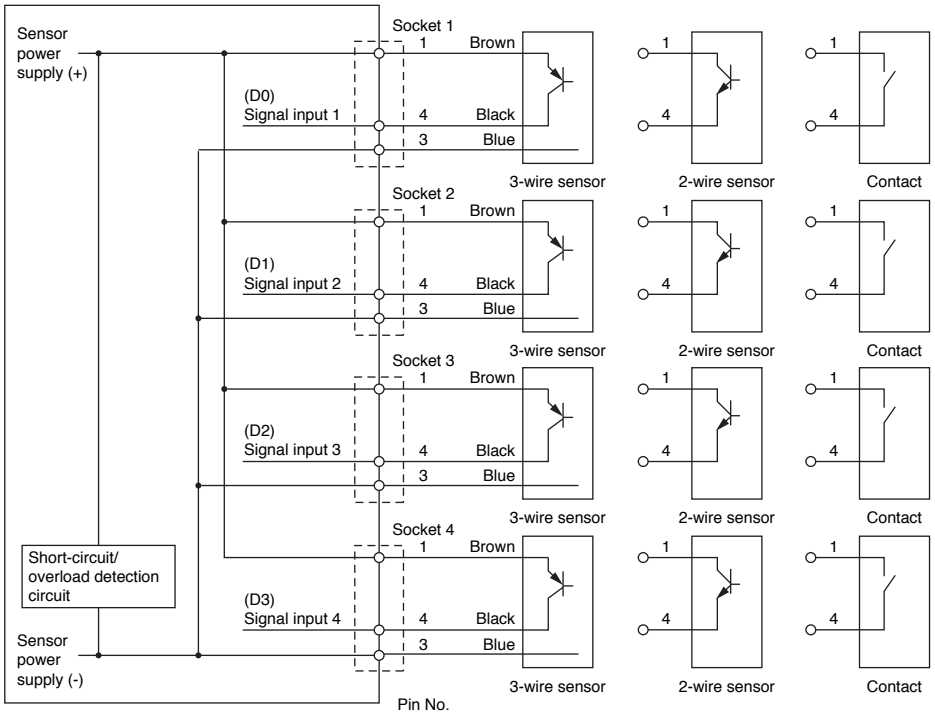
* For connecting AS-i cable, use the SAC-4P-M12MS relaying cable (page 94) to be inserted to the socket 0 (M12).

■ Wiring diagrams

FM6D2-40XXN

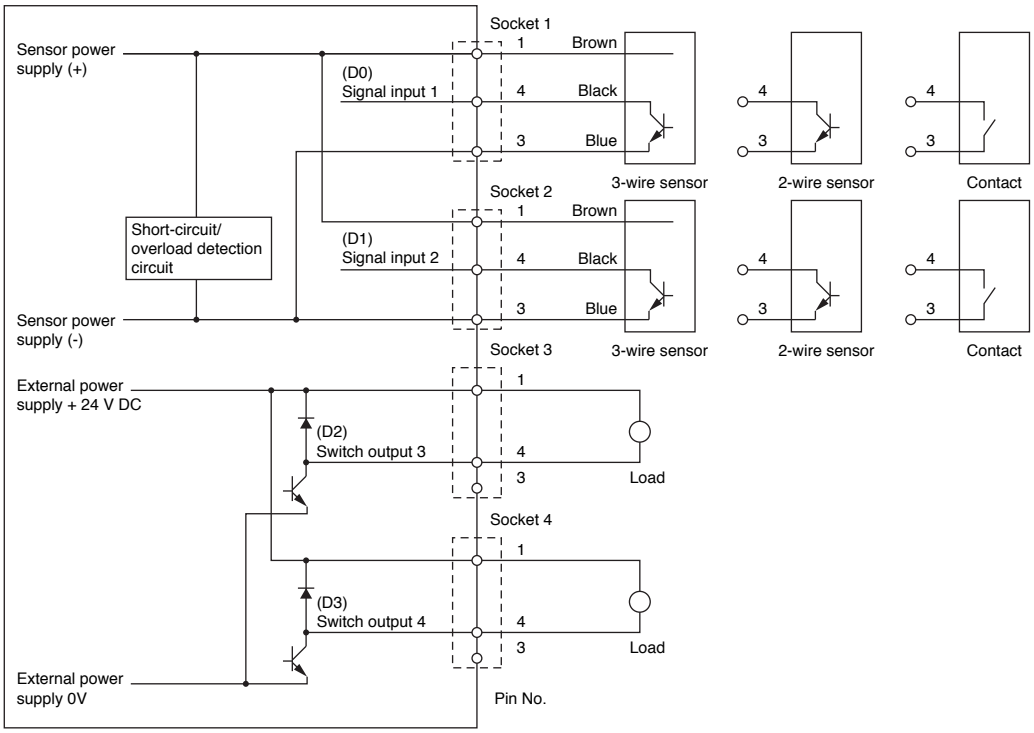


FM6D2-40XXP

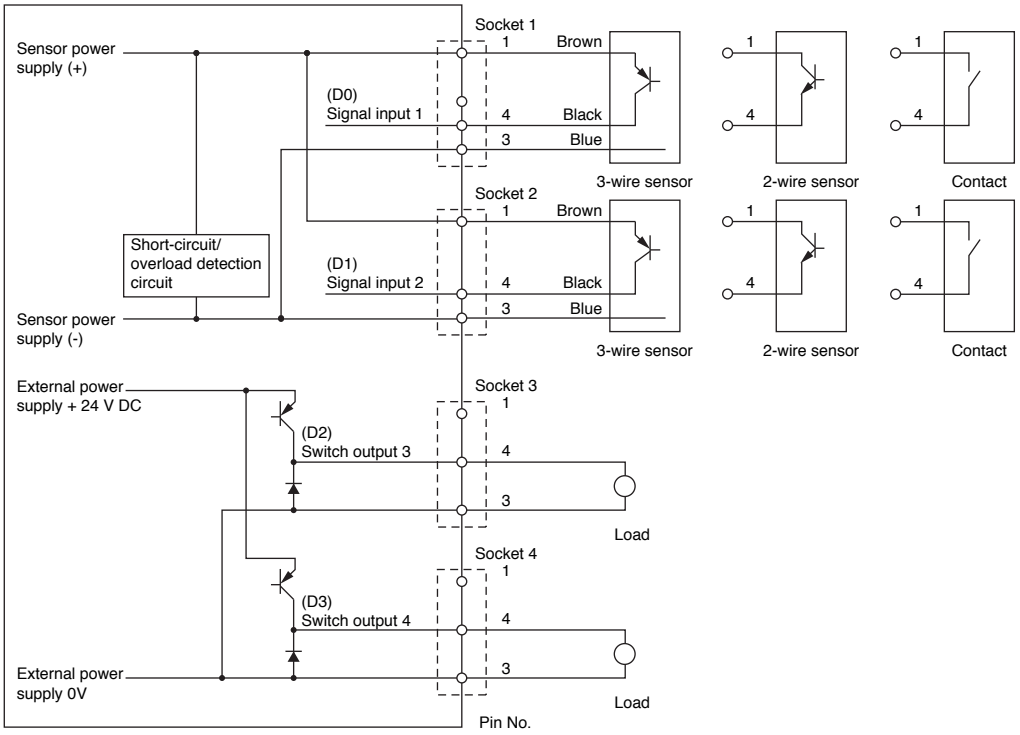


■ Wiring diagrams

FM6D2-22TNN

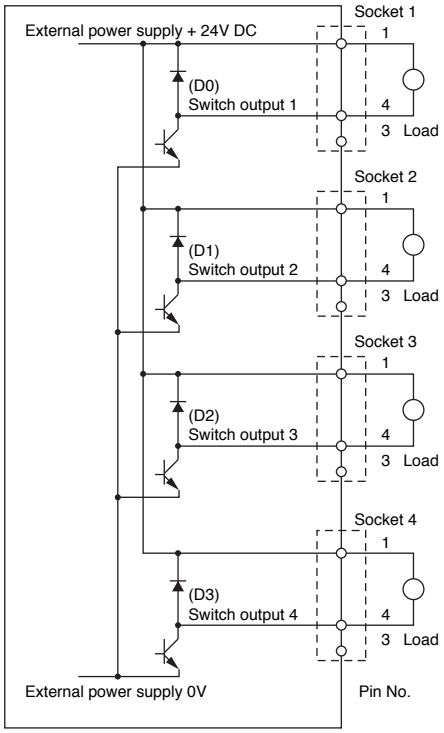


FM6D2-22TPP

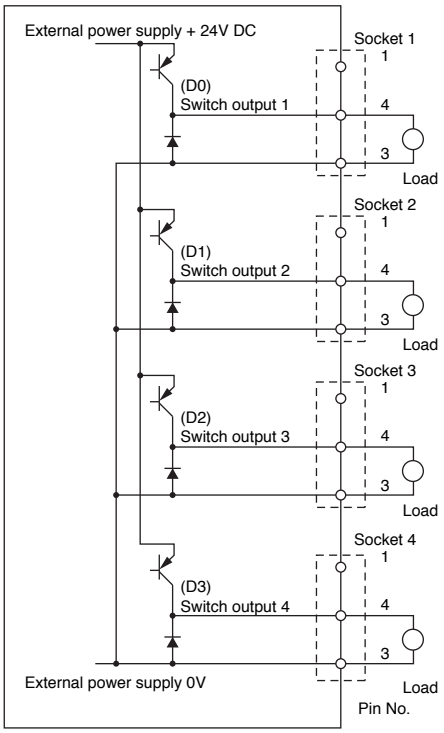


■ Wiring diagrams

FM6D2-04TNX

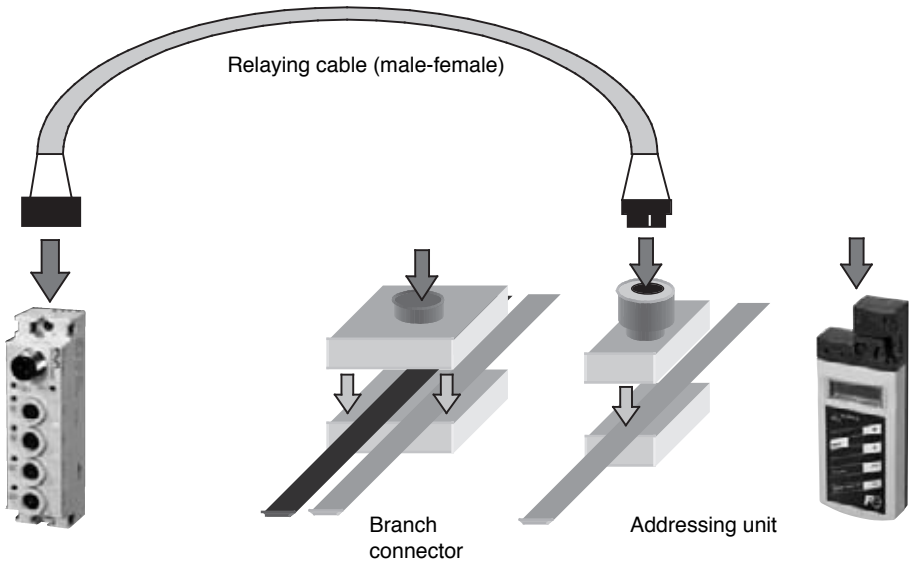


FM6D2-04TPX



■ Precautions on wiring

- Care should be taken to avoid mis-wiring like reverse-wiring with regard to connection to external power supply (24V DC). Products might be damaged or burnt out.
- Connection with external devices
  A relaying cable or the like are necessary as shown below to connect with this slave.
  For details, refer to the User's Manual, "Construction Process" No. FEH705.



Analog slave, FM6A

KK104-004

Actual slave
FM6A31-02

AF01-78

Mounting plate
FM6B1-04FK

■ Description

The FM6A is an analog slave that complies with the AS-Interface specification: Ver. 2.1 (Slave profile: S7.3).

- The FM6A is a flat and compact slave which is provided with 2 channels, similar to FM6D1.
- Mounting plates are available in two types :IEC rail/screw dual mounting and exclusive screw mounting.
- The actual slave can be easily fixed to the mounting plate using one screw.
- Actuators and sensors can be easily connected by single-action M12 connectors (IEC60947-5-2).
- AS-i specification: V2.1

■ Ratings and specifications

Type		**FM6A11-20 FM6A21-20**	**FM6A51-20**	**FM6A31-02**	**FM6A41-02**
Slave type		Analog slave			
AS-i power	Operating voltage (in accordance with AS-i specification)	26.5 to 31.6V DC			
	Current consumption	Max. 50mA			
External power	Operating voltage	24V DC (21.6 to 30V DC)			
	Current consumption	Max. 25mA + sensor supply current	Max. 25mA	Max. 40mA + output load current	Max. 35mA + output load current
LED indication G: Green R: Red	AS-i FAULT(G/R)	G on: Normal operation, R on: Communication error R on and Orange (G+R) on alternating: Slave has address=0 R and G alternating on: Peripheral fault, R flashing: Hardware major fault, Off: Power off			
	EXT POWER(G)	On/off: 24V auxiliary power on/off			
Degree of protection (IEC 60529)		IP67			
Reference temperature		25˚C			
Operating temperature Storage temperature		–20 to 60˚C (no icing or no condensation) –25 to 85˚C (no icing or no condensation)			
Supply of method external power		Via mounting plate			
Electrical protection for AS-i connection	Reverse polarity protection	Built-in			
	Electrostatic discharge resistance	Contact discharge method: ±4kV Aerial discharge method: ±8kV, IEC 61000-4-2 (Class B)			
	Electromagnetic field noise immunity	80 to 1000MHz, Electric field strength:10V/m, IEC 61000-4-3 (Class A)			
	Burst noise	2kV (Class B) / 1kV (Class A), IEC 61000-4-4			
Vibration resistance	Rail mounting(IEC 68-2-6) Screw mounting(IEC 68-2-6)	10 to 55Hz, 0.5mm one-way amplitude 10 to 55Hz, 1mm one-way amplitude			
Shock resistance	Rail mounting(IEC 68-2-27) Screw mounting(IEC 68-2-27)	150m/s^2 (11ms) 300m/s^2 (18ms)			
Mass		Approx. 120g (including mounting plate: Approx. 35g)			
Addressing method		Can be done with an addressing unit (FL1HA-E) via an addressing cable (FX9Y002) connected to the addressing jack on the front of the slave. Connecting the addressing cable to a slave will disconnect the slave from the AS-i connection.			
Approval		CE			

■ Ratings and specifications

Input slave

Type (actual slave)	**FM6A11-20**	**FM6A21-20**	**FM6A51-20**
Mounting plate (sold separately)	**FM6B1-04FE** (Rail/screw dual mounting type) **FM6B2-04FE** (Screw mounting type)		
AS-Interface profile (I/O, ID, ID2)	7, 3, D		
Number of channel	2		
Input range (changed by a parameter.)	4 to 20mA 0 to 20mA	0 to 10V 1 to 5V	Pt100: –200 to +850˚C JPt100: –200 to +500˚C
Input impedance	250Ω	100kΩ	—
Current tolerance	Max. 40mA	—	—
Voltage tolerance	—	±25V	—
Supply to external sensor	Max. 500mA (total of 2 channels)		—
Resolution	16bit (0.49μA)	16bit (0.245mV)	16bit
Overall accuracy (for full scale)	±0.2% (25˚C)		
wiring	4-wire(differential) / 2-wire	4-wire(differential)	4-wire

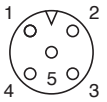
Output slave

Type (actual slave)	**FM6A31-02**	**FM6A41-02**
Mounting plate (sold separately)	**FM6B1-04FE** (Rail/screw dual mounting type) **FM6B2-04FE** (Screw mounting type)	
AS-Interface profile (I/O, ID, ID2)	7, 3, 5	
Number of channel	2	
Output range (changed by a parameter.)	4 to 20mA 0 to 20mA	0 to 10V 1 to 5V
Load impedance	Max. 500Ω (Max. 0.1mH)	Min. 1kΩ (Max. 0.1μF)
Output current	Max. 24mA	—
Output voltage	—	Max. 12V
Resolution	12bit (6μA)	12bit (3mV)
Overall accuracy (for full scale)	±0.5% (–20 to 60˚C)	
Wiring	2-wire	2-wire

■ Wirings

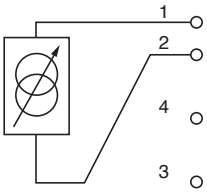
Current input slave
FM6A11-20

Pin assignment
1: L +24V
2: IN+
3: GND
4: IN–
5: N.C.



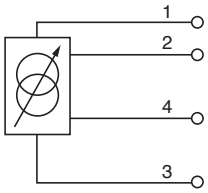
2-wire sensor

Parameter setting
for 2-wire connection



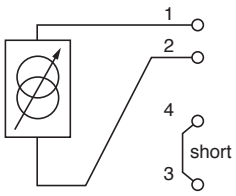
4-wire sensor

Supply from
analog slave



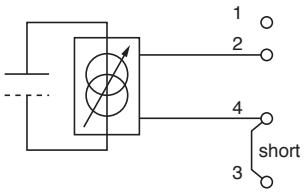
2-wire sensor

Parameter setting
for 4-wire connection



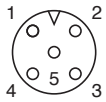
4-wire sensor

Supply from
external power supply



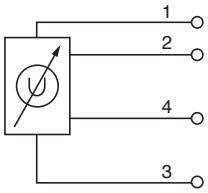
Voltage input slave
FM6A21-20

Pin assignment
1: L +24V
2: IN+
3: GND
4: IN–
5: N.C.



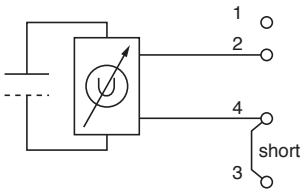
4-wire sensor

Supply from
analog slave



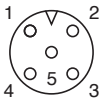
4-wire sensor

Supply from
external power supply

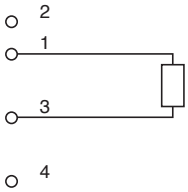


Current output slave
FM6A31-02

Pin assignment
1: OUT
2: N.C.
3: GND
4: N.C.
5: N.C.

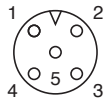


Wiring

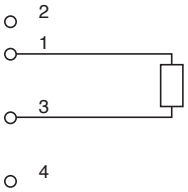


Voltage output slave
FM6A41-02

Pin assignment
1: OUT
2: N.C.
3: GND
4: N.C.
5: N.C.

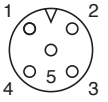


Wiring

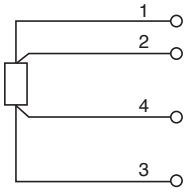


Resistance temperature sensor input slave
FM6A51-20

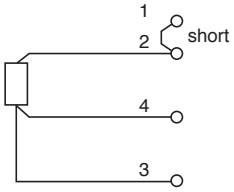
Pin assignment
1: Iconst+
2: IN+
3: Iconst–
4: IN–
5: N.C.



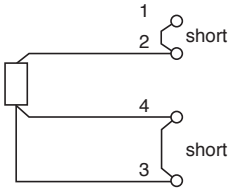
4-wire sensor



3-wire sensor



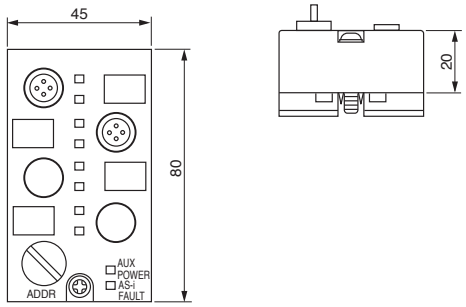
2-wire sensor



■ Dimensions mm

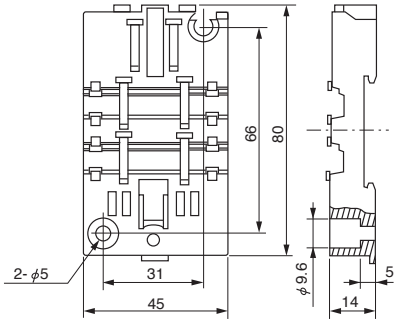
Actual slave

FM6A11-20, FM6A21-20
FM6A51-20
FM6A31-02, FM6A41-02

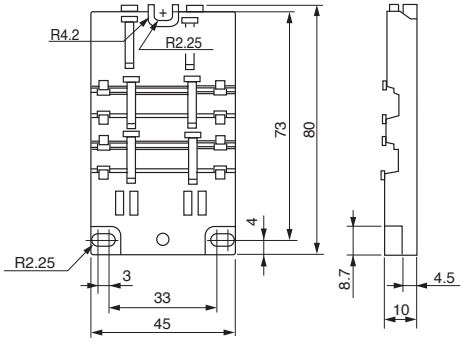


Mounting plate

Rail/screw dual mounting type
FM6B1-04FE

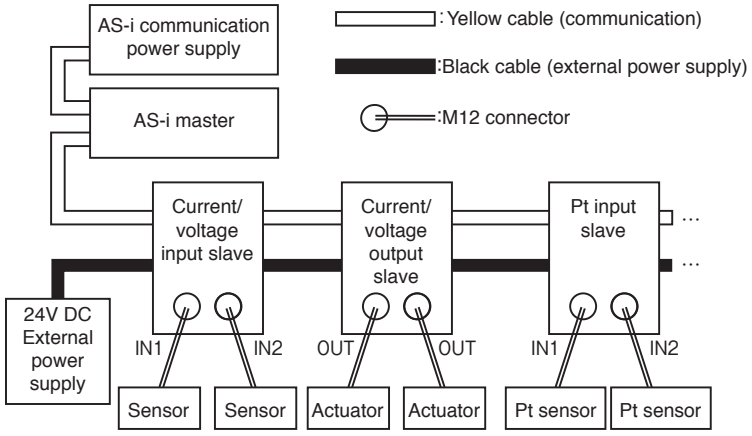


Screw mounting type
FM6B2-04FE



■ Connection configuration

- The connection between this slave and AS-i cable (yellow cable and black cable) employs insulation piercing connection.



External power supply is essential to use this slave.
Care shall be taken to avoid miswiring like reverse wiring.

■ Termination of AS-i cable

- No terminating resistors are reguired.
- For live parts exposure prevention, hide the AS-i cable end, inserting the rubber spacer supplied with the mounting plate.

■ Precaution on wiring

- Care should be taken to avoid miswiring like reverse wiring with regard to connection to external power supply (24V DC). Products might be damaged or burnt out.
- The analog processor in this slave operates by 24V DC external power supply. Excess noise to external power supply may affect the accuracy. Connect the external power cable to the external power supply separately installed from noise generating devices.

■ Cautions on connecting external power supply

If voltage output type slaves or current output type slaves are kept supplied with external power supply, not connected with AS-i power supply, erroneous output prevention circuit in analog slave will be activated, thus, a short-circuit in the internal output circuit may result.
Turn on and off the AS-i power supply and external power supply simultaneously. Failure may result.

Dustproof slave (Flat type), FM4D/FM4DB

■ Description

The slave inclueds an actual slave and a top section which is the slave cover. The IP40 (except aux. terminal-block) structure shuts out dust to provide excellent environmental resistance. By allowing use outside the control panel, in locations that do not require water resistance, the slave eliminates the need for relay boxes and contributes to downsizing.

- Flat, compact slaves can be installed in virtually any location.
- The slave can be easily connected to the AS-i flat cable by insulation piercing connection.
- Short-circuit protection and overload protection are provided for the sensor power supply.
- Actuators and sensors can be easily connected by single-action insulation displacement connectors.
- The 24V DC sensor power is supplied from the AS-i flat cable.
- The slave is addressed with an addressing jack located on the side of the slave.
- AS-i specification: V2.0, V2.1

KK01-265A

FM4D-40XXN

KK01-265A

FM4DB-40XXN

■ Ratings and specifications

Type	NPN model PNP model		**FM4D-40XXN** **FM4D-40XXP**	**FM4D-04TNX** **—**	**FM4D-22TNN** **FM4D-22TPP**
Slave type			Standard slave		
Number of inputs/outputs			4 inputs	4 outputs	2 inputs/2 outputs
AS-Interface profile (I/O, ID)			0, 0	8, 0	3, 0
Operating voltage (in accordance. with AS-i specification)			26.5 to 31.6V DC		
Current consumption	Slave only Including sensors		45mA DC or less 245mA DC or less	45mA DC or less 245mA DC or less	45mA DC or less —
LED indication G: Green R: Red Y: Yellow	AS-i (G/R)		G on: Power on, R on and Orange (G+R) on alternating: Slave has address = 0, R on: Communication error, R flashing: Input power overload, Off: AS-i power off		
	IN1 to IN4 (or 2) (Y)		On/off: Input on/off	On/off: Input on/off	—
	OUT1 to OUT4 (or 2) (Y)		—	On/off: output on/off	On/off: output on/off
Input	NPN	On voltage (Power supply (+) - Input) Off voltage (Power supply (+) - Input) On current (sorurce) Off current	10V or more 6V or less Approx. 5mA 1.5mA or less	— — — —	10V or more 6V or less Approx. 5mA 1.5mA or less
	PNP	On voltage (Power supply (+) - Input) Off voltage (Power supply (+) - Input) On current (sink) Off current	10V or more 6V or less Approx. 5mA 1.5mA or less	— — — —	10V or more 6V or less Approx. 5mA 1.5mA or less
Sensor power supply via AS-i cable	Short-circuit and overload protection Sensor voltage range Current carrying capacity for all inputs		Built-in 20 to 26.5V (I ≦ 160mA) 18 to 26.5V (I ≦ 200mA) 200mA (Ta ≦ 25˚C) 160mA (Ta = 45˚C) 110mA (Ta = 70˚C)	— 20 to 26.5V (I ≦ 160mA) 18 to 26.5V (I ≦ 200mA) 200mA (Ta ≦ 25˚C) 160mA (Ta = 45˚C) 110mA (Ta = 70˚C)	Built-in — —
Output *	External power supply 24V DC		—	Via black AS-i flat cable	Via black AS-i flat cable
	Operating voltage range		—	20 to 30V DC	20 to 30V DC
	NPN model PNP model		— —	NPN transistor PNP transistor	NPN transistor PNP transistor
	Current carrying capacity, per point Voltage drop Inductive surge protection Output status on communication error		— — — —	Max. 200mA 1.5V or less Built-in Off	Max. 200mA 1.5V or less Built-in Off
Operating temperature			–25 to +70˚C (no icing or no condensation)		
Storage temperature			–25 to +85˚C (no icing or no condensation)		
Relative humidity			35 to 85% RH (no condensation)		
Electrical protection for AS-i connection	Reverse polarity protection		Built-in		
	Electrostatic discharge resistance		Contact discharge method: ±4kV, Aerial discharge method: ±8kV, IEC 61000-4-2 (Class A)		
	Electromagnetic field noise immunity		80 to 1000MHz, Electric field strength: 10V/m, IEC 61000-4-3 (Class A)		
	Burst noise		2kV (Class B)/1kV (Class A), IEC 61000-4-4		
Vibration resistance	Screw mounting (IEC 68-2-6)		10 to 55Hz, double amplitude 1.5mm for 2 hours in each direction of X, Y, Z		
Shock resistance	Screw mounting (IEC 68-2-27)		500m/s^2 for 3 times in each direction of X, Y, Z		
Degree of protection (IEC 60529)			IP40 (excluding terminal section)		
Mass			Approx. 60g		
Addressing method (Addresses: between 1 and 31)			Can be made with an addressing unit (FL1HA-E) via addressing cable (FX9Y002) connected to the addressing jack on the side of the slave. Connecting the addressing cable to a slave will disconnect the slave from the AS-Interface.		
Approval			CE		

Note: * Short-circuit protection is not built-in.

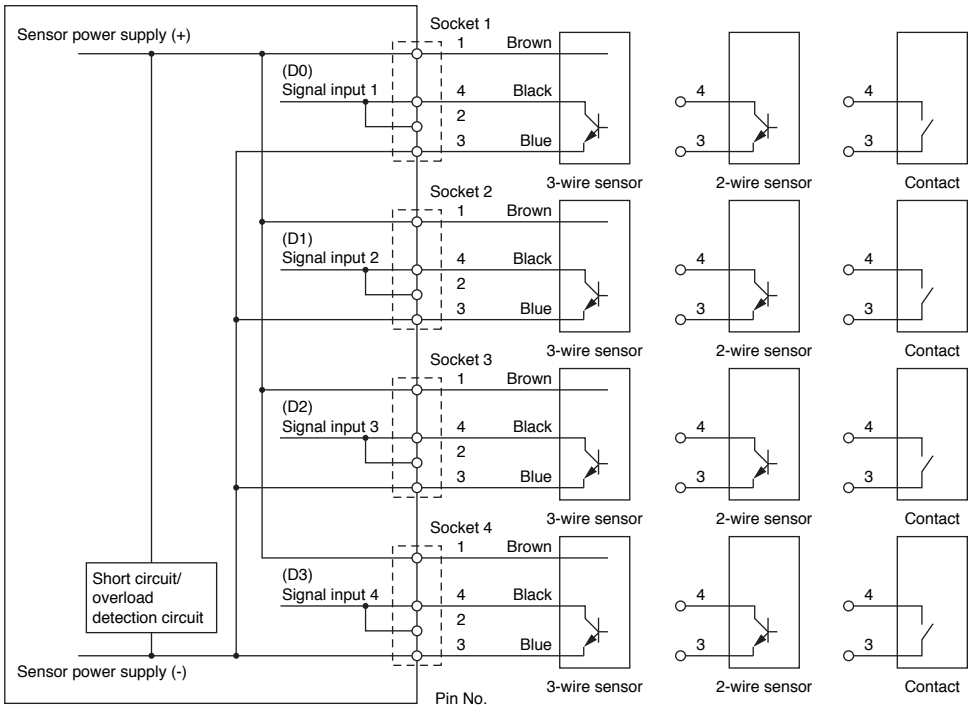
■ Ratings and specifications

Type	NPN model		FM4DB-40XXN	FM4DB-03TNX
Slave type			A/B slave	
Number of inputs/outputs			4 inputs	3 outputs
AS-Interface profile (I/O, ID, ID2) [*1]			0, A, 0	8, A, 0
Operating voltage (in accordance. with AS-i specification)			26.5 to 31.6V DC	
Current consumption	Slave only		45mA DC or less	45mA DC or less
	Including sensors		245mA DC or less	—
LED indication G: Green R: Red Y: Yellow	AS-i (G/R)		G on: Power on, R on and Orange (G+R) on alternating: Slave has address = 0, R on: Communication error, R flashing: Input power overload, Off: AS-i power off	
	IN1 to IN4 (Y)		On/off: input on/off	—
	OUT1 to OUT3 (Y)		—	On/off: output on/off
Input	NPN	On voltage (Power supply (+) - Input)	10V or more	—
		Off voltage (Power supply (+) - Input)	6V or less	—
		On current (sorurce)	Approx. 5mA	—
		Off current	1.5mA or less	—
Sensor power supply via AS-i cable	Short-circuit and overload protection		Built-in	—
	Sensor voltage range		20 to 26.5V (I ≦ 160mA) 18 to 26.5V (I ≦ 200mA)	—
	Current carrying capacity for all inputs		200mA (Ta ≦ 25˚C) 160mA (Ta = 45˚C) 130mA (Ta = 60˚C)	—
Output [*2]	External power supply 24V DC		—	Via black AS-i flat cable
	Operating voltage range		—	20 to 30V DC
	NPN model		—	NPN transistor
	Current carrying capacity, per point		—	Max. 200mA
	Voltage drop		—	1.5V or less
	Inductive surge protection		—	Built-in
	Output status on communication error		—	Off
Degree of protection (IEC60529)			IP40 (except terminal section)	
Operating temperature			–25 to +60˚C (no icing or no condensation)	
Storage temperature			–25 to +85˚C (no icing or no condensation)	
Relative humidity			35 to 85% RH (no condensation)	
Supply method of external power			—	via external power supply terminal
Electrical protection for AS-i connection	Reverse polarity protection		Built-in	
	Electrostatic discharge resistance		Contact discharge method: ±4kV, Aerial discharge method: ±8kV, IEC 61000-4-2 (Class A)	
	Electromagnetic field noise immunity		80 to 1000MHz, Electric field strength: 10V/m, IEC 61000-4-3 (Class A)	
	Burst noise		2kV (Class B)/1kV (Class A), IEC 61000-4-4	
Vibration resistance	Screw mounting (IEC 68-2-6)		10 to 55Hz, double amplitude 1.5mm for 2 hours in each direction of X, Y, Z	
Shock resistance	Screw mounting (IEC 68-2-27)		500m/s^2 for 3 times in each direction of X, Y, Z	
Mass			Approx. 60g	
Addressing method (Addresses: between 1A (1B) and 31A (31B))			Can be made with an addressing unit (FL1HA-E) via addressing cable (FX9Y002) connected to the addressing jack on the side of the slave. Connecting the addressing cable to a slave will disconnect the slave from the AS-Interface.	
Approval			CE	

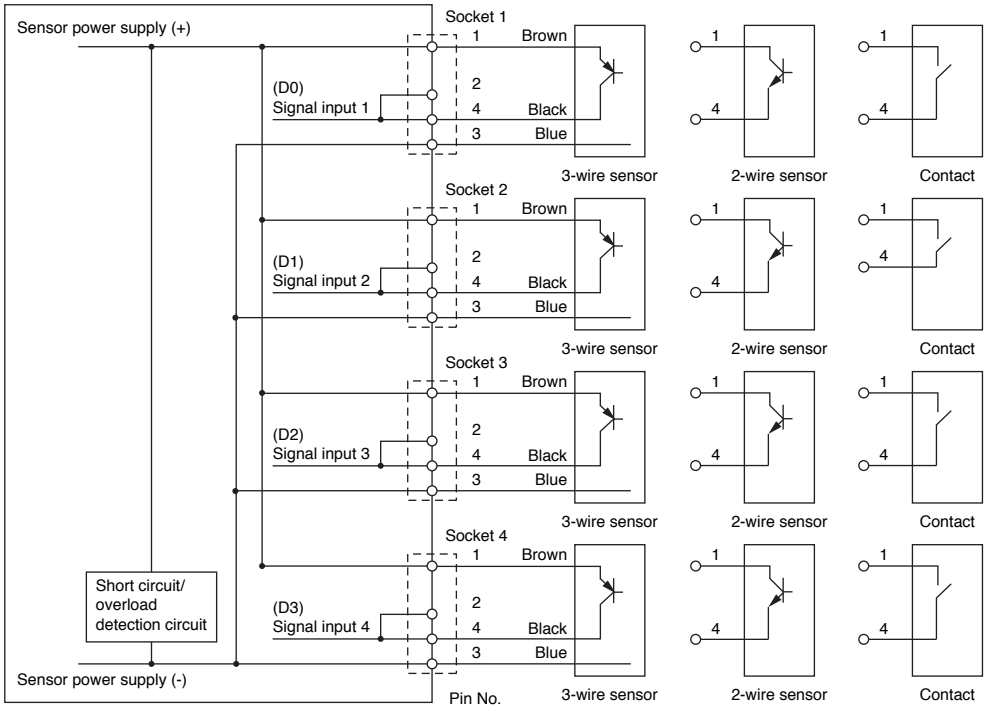
Notes: [*1] The initial value of ID1 is 7 (variable from 0 to 7).
[*2] Short-circuit protection is not built-in.

■ Wiring diagrams

FM4D-40XXN, FM4DB-40XXN

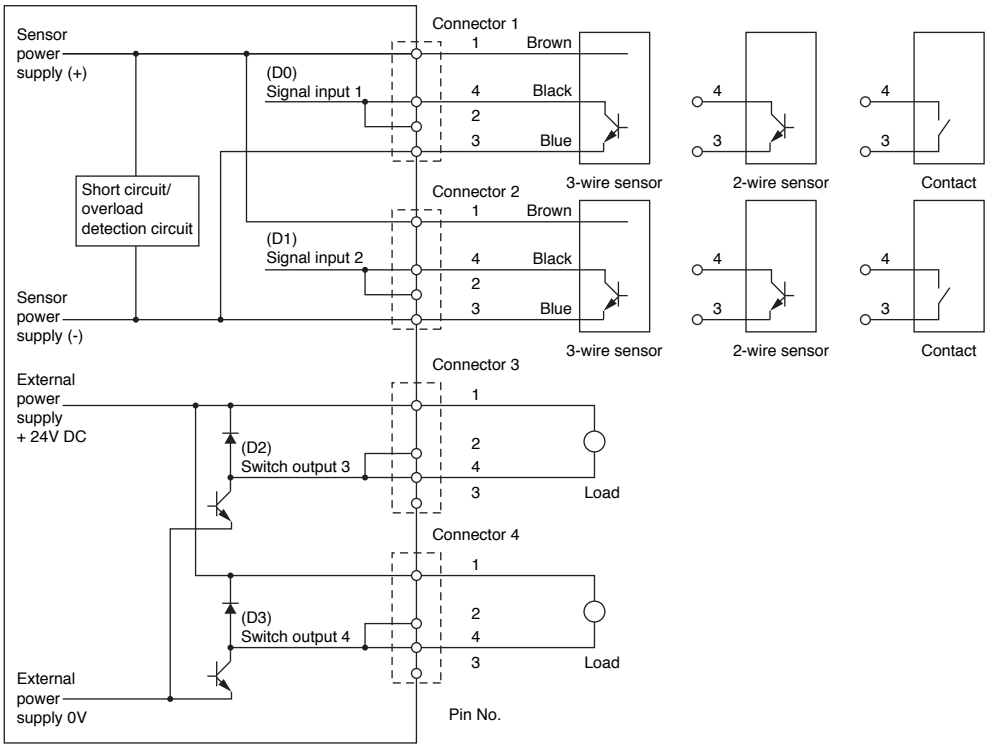


FM4D-40XXP

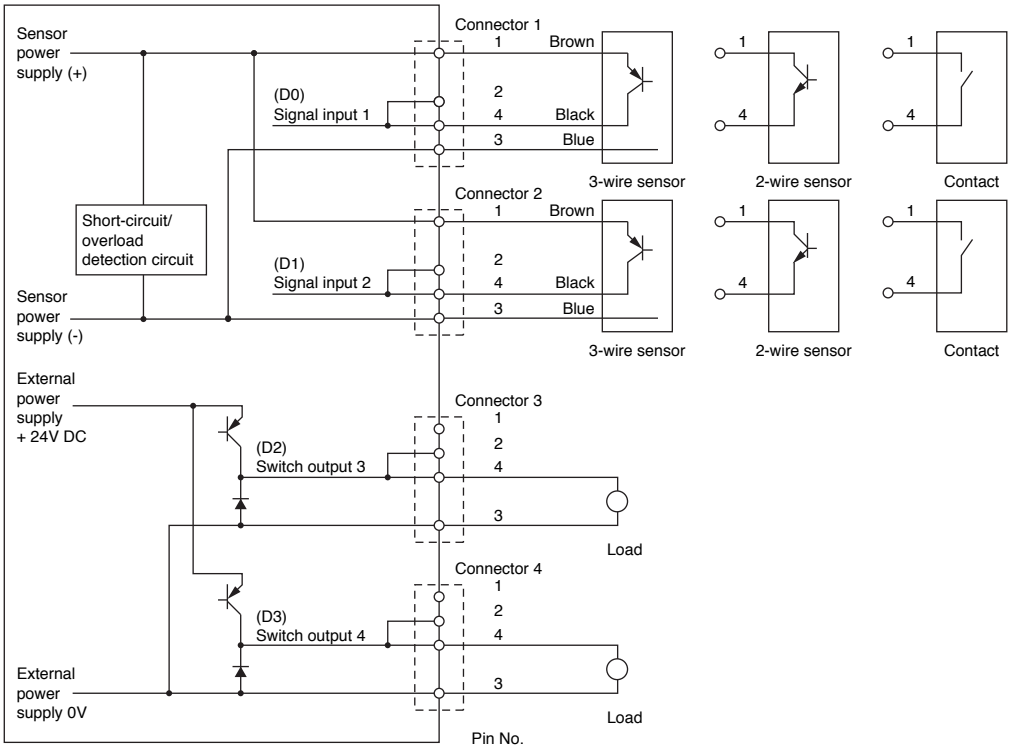


■ Wiring diagrams

FM4D-22TNN

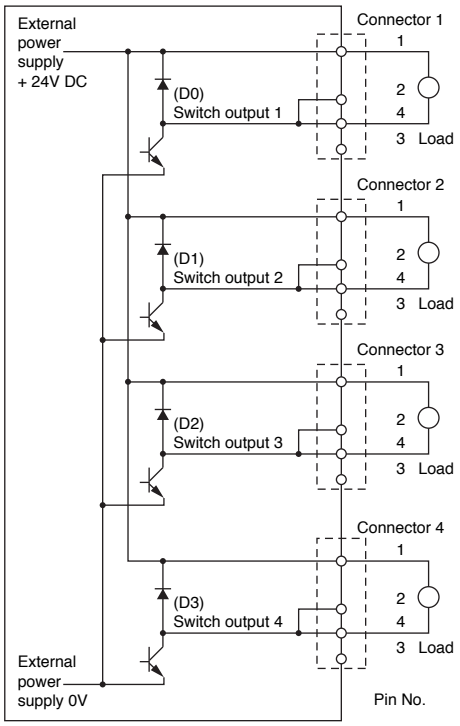


FM4D-22TPP

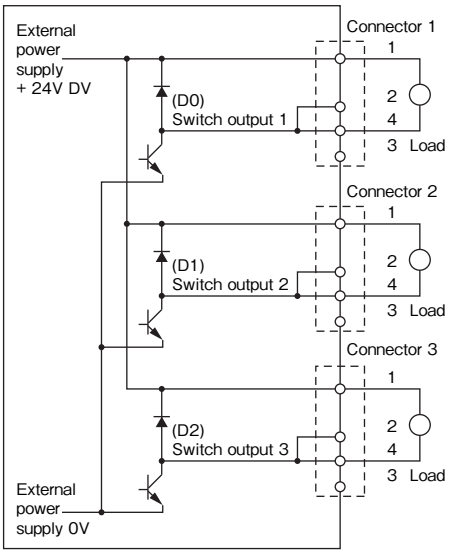


■ Wiring diagrams

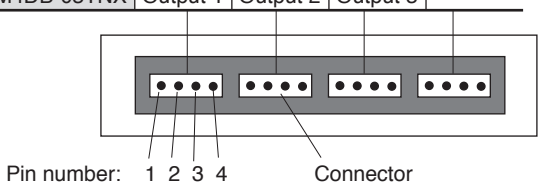
FM4D-04TNX



FM4DB-03TNX



Data bit	D0	D1	D2	D3
FM4D-40XX□	Input 1	Input 2	Input 3	Input 4
FM4D-22T□□	Input 1	Input 2	Output 1	Output 2
FM4D-04TNX	Output 1	Output 2	Output 3	Output 4
FM4DB-40XXN	Input 1	Input 2	Input 3	Input 4
FM4DB-03TNX	Output 1	Output 2	Output 3	–



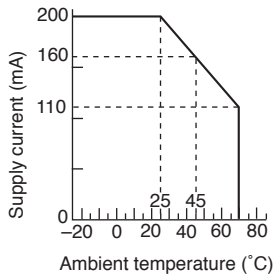
Applicable connector

- Manufacturer: Honda Tsushin Kogyo Co., Ltd.
- Type: QZ-61-H4SFUT1, T3 (applicable wire size: 0.08 to 0.2mm^2)
- Type: QZ-61-H4SFUT2, T4 (applicable wire size: 0.3mm^2)

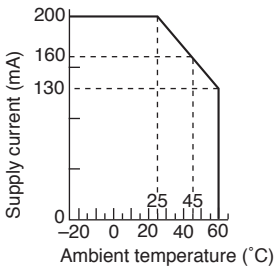
See page 94, "Connectors for dustproof slaves."

■ Current carrying capacity for all input (per slave)

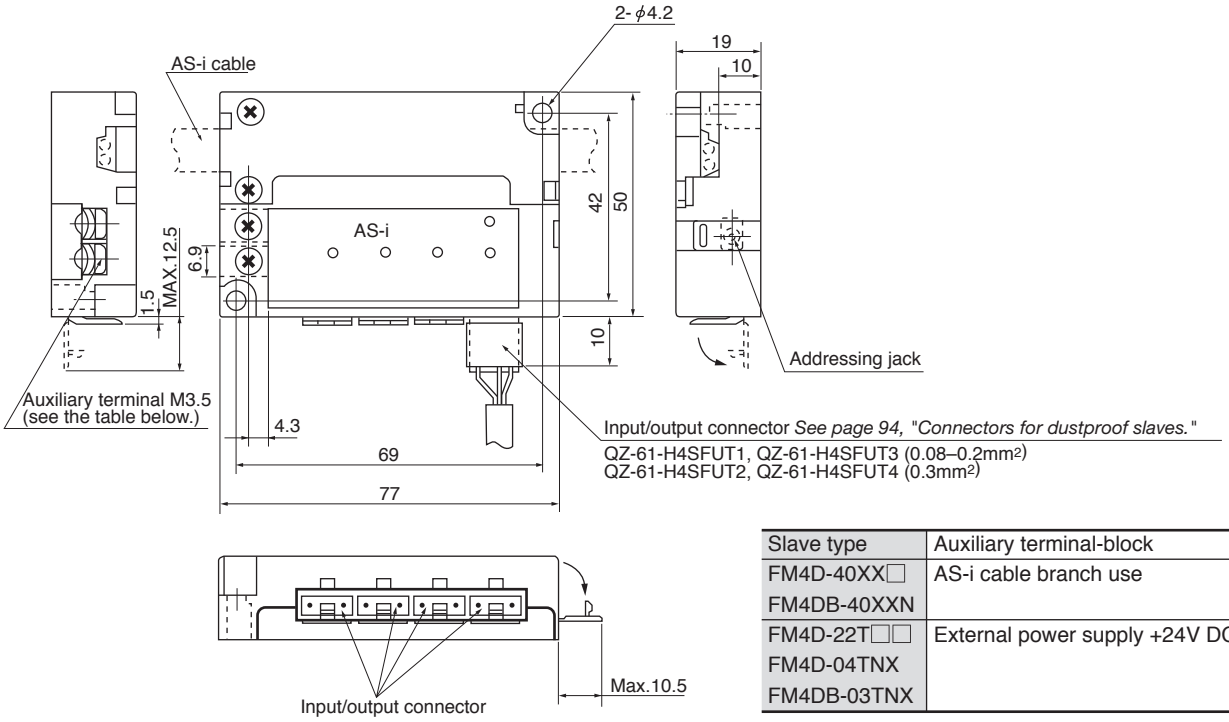
• Standard slave



• A/B slave

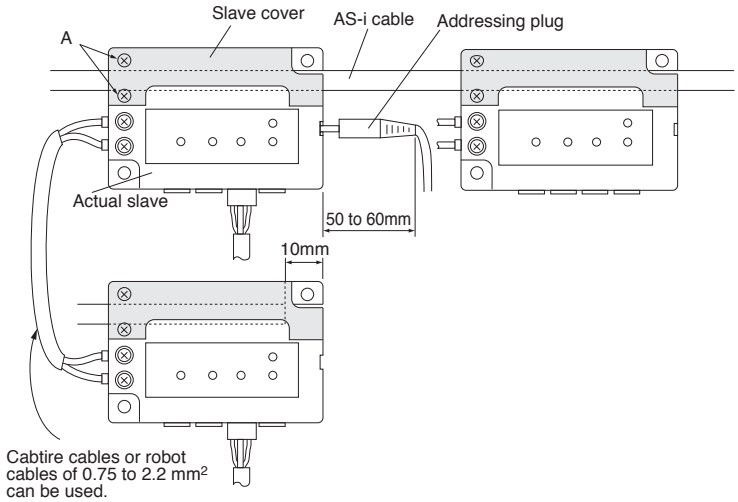


■ Dimensions, mm



Slave type	Auxiliary terminal-block
FM4D-40XX□	AS-i cable branch use
FM4DB-40XXN	
FM4D-22T□□	External power supply +24V DC use
FM4D-04TNX	
FM4DB-03TNX	

■ Precautions on installation and wiring



- To connect the AS-i cable, tighten the screws (marked A) until the slave cover and actual slave fit together completely. Operating the slave with the cover and actual slave not completely fit may result in poor contact.
- To connect the FM4D-22T □□ , FM4D-04TNX or FM4DB-03TNX to output devices for load control, connect the +24V DC external power supply to the auxiliary terminal. The auxiliary terminal of the FM4D-40XX□ or FM4DB-40XXN is for use with the AS-i cable branch terminal. Do not connect an external power supply to it.
- If a sensor with power consumption of more than 200mA is connected to the sensor power supply of the slave, the overload and short-circuit protective function will operate and the sensor power supply will be stopped even when 0.5ms has passed after the inrush current is generated. If a connected sensor has a high inrush current, make sure that current consumption with a lapse of 0.5 ms after the inrush current is 200 mA or less.

Dustproof slave (Slim type), FM4D1/FM4DB1

■ Description

While offering excellent IP40 environmental resistance, the slave minimizes installation space with its vertical mounting configuration. By using the desired number of slaves closely mounted, empty I/Os can be reduced and installation space greatly decreased in comparison with the use of I/O units.

- The slim 17.5mm width contributes to space saving.
- The mounting plates are IEC rail/screw dual mounting type.
- The slave can be easily connected to the AS-Interface flat cables by insulation piercing connection.
- Short-circuit protection and overload protection are provided for the sensor power supply.
- Actuators and sensors can be easily connected by single-action insulation displacement connectors.
- The 24V DC sensor power is supplied from the AS-i flat cable.
- The slave is addressed with an addressing jack located on the front of the slave.
- AS-i specification: V2.0, V2.1

KK02-211A

FM4D1-40XXN

KK04-006

FM4DB1-40XXN

■ Ratings and specifications

Type	NPN model	FM4D1-40XXN	FM4D1-04TNX
Slave type		Standard slave	
Number of inputs/outputs		4 inputs (NPN)	4 outputs (NPN)
AS-Interface profile (I/O, ID)		0, 0	8, 0
Operating voltage (in accordance. with AS-i specification)		26.5 to 31.6V DC	
Current consumption	Slave only Including sensors	45mA DC or less 205mA DC or less	45mA DC or less —
LED indication G: Green R: Red Y: Yellow	AS-i (G/R)	G on: Power on, R on and Orange (G+R) on alternating: Slave has address = 0, R on: Communication error, R flashing: Input power overload, Off: AS-i power off	
	External power supply (G) IN1 to IN4 (Y) OUT1 to OUT4 (Y)	— On/off: Input on/off —	On: External power supply on — On/off: Output on/off
Input	On Voltage (Power supply (+) - Input) Off voltage (Power supply (+) - Input) On current (sorurce) Off current	10V or more 6V or less Approx. 5mA 1.5mA or less	— — — —
Sensor power supply (per slave)	Short-circuit and overload protection Sensor voltage range Current carrying capacity for all inputs	Built-in 20 to 27V (I ≦ 160mA) 160mA (Ta ≦ 25˚C) 130mA (Ta = 45˚C) 107.5mA (Ta = 60˚C)	— — —
Output *	External power supply 24V DC Operating voltage range Type of output Current carrying capacity Voltage drop Inductive surge protection Output status on communication error	— — — — — — —	Via black AS-i flat cable 20 to 30V DC NPN transistor 200mA per point 1.5V or less Built-in Off
Degree of protection (IEC60529)		IP40 (with connectors' and jack's hinges closed)	
Reference temperature		25˚C	
Operating temperature		–25 to +60˚C (no icing or no condensation)	
Storage temperature		–25 to +85˚C (no icing or no condensation)	
Relative humidity		35 to 85% RH (no condensation)	
Electrical protection for AS-i	Reverse polarity protection	Built-in	
	Electrostatic discharge resistance	Contact discharge method: ±4kV, Aerial discharge method: ±8kV, IEC61000-4-2 (Class A)	
	Electromagnetic field noise immunity	80 to 1000MHz, Electric field strength: 10V/m, IEC61000-4-3 (Class A)	
	Burst noise	2kV (Class B) /1kV (Class A), IEC61000-4-4	
Vibration resistance	Rail mounting (IEC 68-2-6) Screw mounting (IEC 68-2-6)	10 to 55Hz, 0.5mm one-way amplitude 10 to 55Hz, 1mm one-way amplitude	
Shock resistance	Rail mounting (IEC 68-2-27) Screw mounting (IEC 68-2-27)	150m/s^2 (11ms) 300m/s^2 (18ms)	
Mass		Approx. 60g (including mounting plate)	
Addressing method (Addresses: between 1 and 31)		Can be done with an addressing unit (FL1HA-E) via an addressing cable (FX9Y002) connected to the addressing jack on the slave front. Connecting the addressing cable to a slave will disconnect the slave from the AS-Interface.	
Approval		CE	

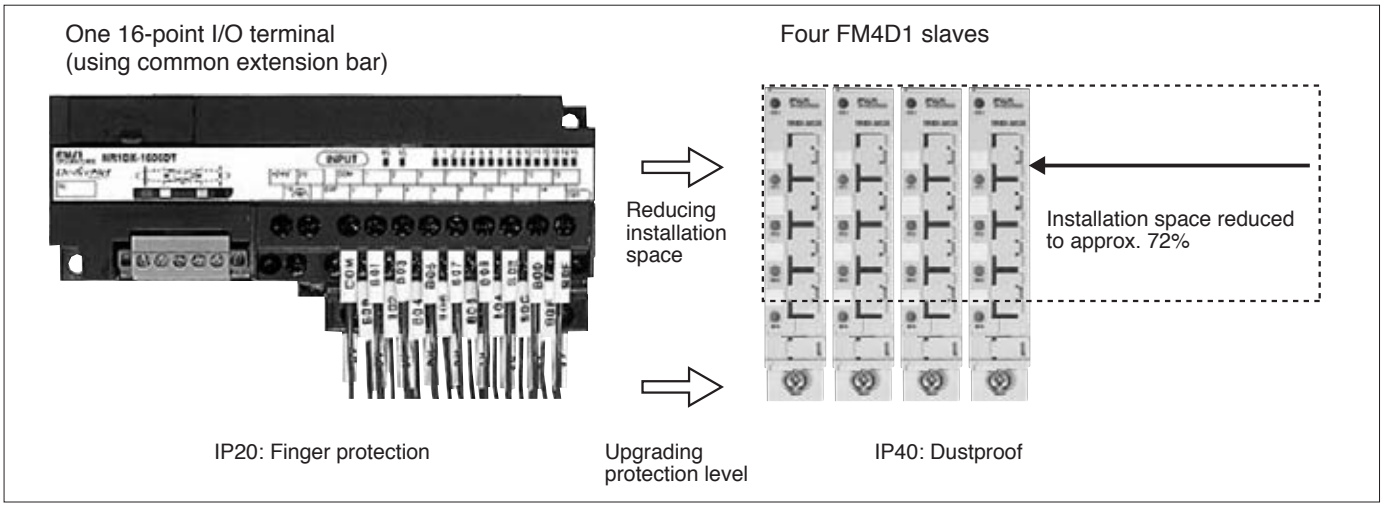
Note: *Short-cuicuit protection is not built-in.

■ Ratings and specifications

Type	NPN model	FM4DB1-40XXN	FM4DB1-03TNX
Slave type		A/B slave	
Number of inputs/outputs		4 inputs (NPN)	3 outputs (NPN)
AS-Interface profile (I/O, ID, ID2) [*1]		0, A, 0	8, A, 0
Operating voltage (in accordance. with AS-i specification)		26.5 to 31.6V DC	
Current consumption	Slave only	45mA DC or less	45mA DC or less
	Including sensors	205mA DC or less	—
LED indication G: Green R: Red Y: Yellow	AS-i (G/R)	G on: Power on, R on and Orange (G+R) on alternating: Slave has address = 0, R on: Communication error, R flashing: Input power overload, Off: AS-i power off	
	IN1 to IN4 (Y)	On/off: Input on/off	—
	OUT1 to OUT3 (Y)	—	On/off: Output on/off
Input	On voltage (Power supply (+) - Input)	10V or more	—
	Off voltage (Power supply (+) - Input)	6V or less	—
	On current (sorurce)	Approx. 5mA	—
	Off current	1.5mA or less	—
Sensor power supply (per slave)	Short-circuit and overload protection	Built-in	—
	Sensor voltage range	20 to 27V (I ≦ 160mA)	—
	Current carrying capacity for all inputs	160mA (Ta ≦ 25˚C)	—
		130mA (Ta = 45˚C)	
		107.5mA (Ta = 60˚C)	
Output [*2]	External power supply 24V DC	—	Via black AS-i flat cable
	Range of operating voltage	—	20 to 30V DC
	Type of output	—	NPN transistor
	Current carrying capacity, per point	—	Max. 200mA
	Voltage drop	—	1.5V or less
	Inductive surge protection	—	Built-in
	Output status on communication error	—	Off
Degree of protection (IEC60529)		IP40 (with connectors' and jack's hinges closed)	
Reference temperature		25˚C	
Operating temperature		–25 to +60˚C (no icing or no condensation)	
Storage temperature		–25 to +85˚C (no icing or no condensation)	
Relative humidity		35 to 85% RH (no condensation)	
Electrical protection for AS-i	Reverse polarity protection	Built-in	
	Electrostatic discharge resistance	Contact discharge method: ±4kV, Aerial discharge method: ±8kV, IEC61000-4-2 (Class A)	
	Electromagnetic field noise immunity	80 to 1000MHz, Electric field strength: 10V/m, IEC61000-4-3 (Class A)	
	Burst noise	2kV (Class B) /1kV (Class A), IEC61000-4-4	
Vibration resistance	Rail mounting (IEC 68-2-6)	10 to 55Hz, 0.5mm one-way amplitude	
	Screw mounting (IEC 68-2-6)	10 to 55Hz, 1mm one-way amplitude	
Shock resistance	Rail mounting (IEC 68-2-27)	150m/s^2 (11ms)	
	Screw mounting (IEC 68-2-27)	300m/s^2 (18ms)	
Mass		Approx. 60g (including mounting plate)	
Addressing method (Addresses: between 1 and 31)		Can be done with an addressing unit (FL1HA-E) via an addressing cable (FX9Y002) connected to the addressing jack on the slave front. Connecting the addressing cable to a slave will disconnect the slave from the AS-Interface.	
Approval		CE	

Notes: [*1] The initial value of ID1 is 7 (variable from 0 to 7).
[*2] Short-cuicuit protection is not built-in.

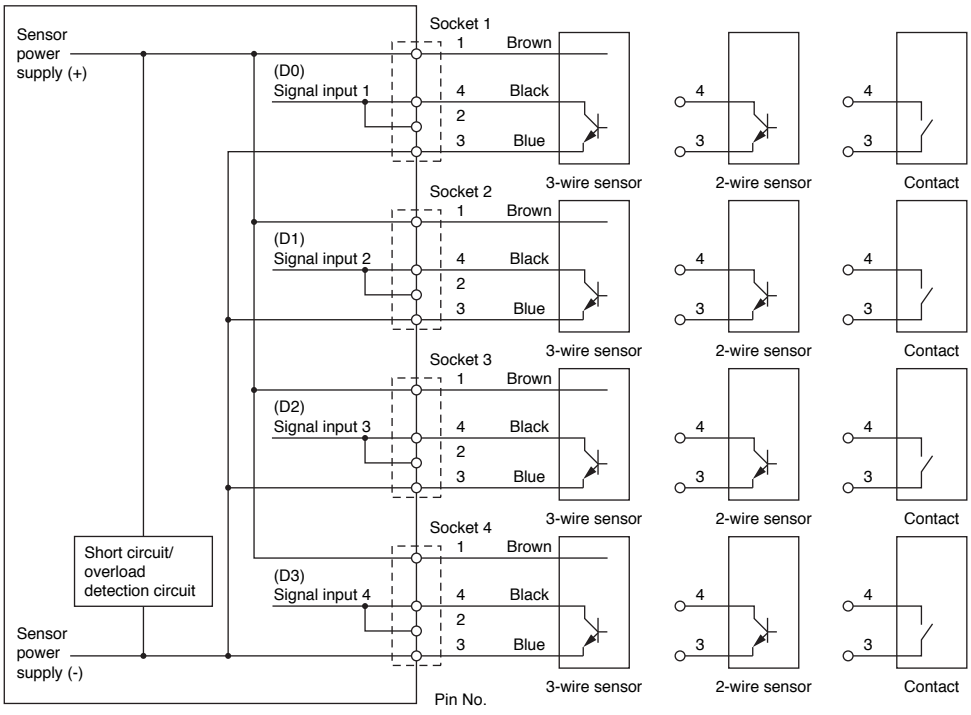
■ Great space-saving effect



Use 3-wire type sensors for further space-saving.

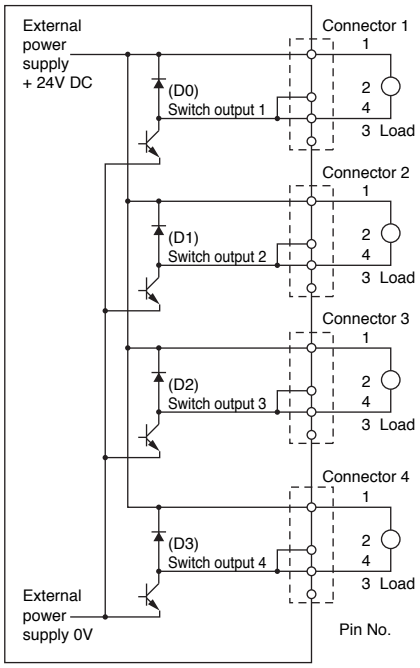
■ Wiring diagrams

FM4D1-40XXN, FM4DB1-40XXN

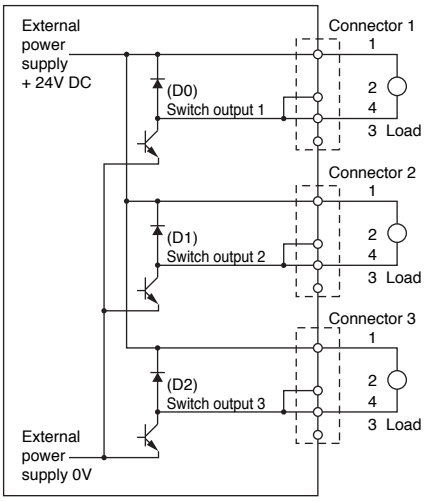


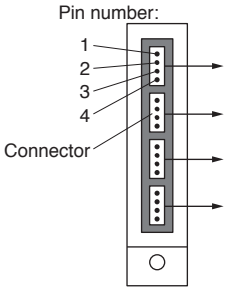
■ Wiring diagrams

FM4D1-04TNX



FM4DB1-03TNX





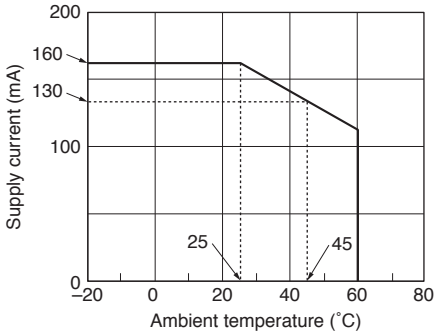
FM4D1-40XXN	FM4D1-04TNX	FM4DB1-40XXN	FM4DB1-03TNX	Data bit
Input 1	Output 1	Input 1	Output 1	D0
Input 2	Output 2	Input 2	Output 2	D1
Input 3	Output 3	Input 3	Output 3	D2
Input 4	Output 4	Input 4	–	D3

Where 2-wire DC sensor is used
- Unnecessary to connect to No. 1 pin. Connect brown wire to No. 2 or No. 4 pin.
- The leakage current should be 1.5mA or less

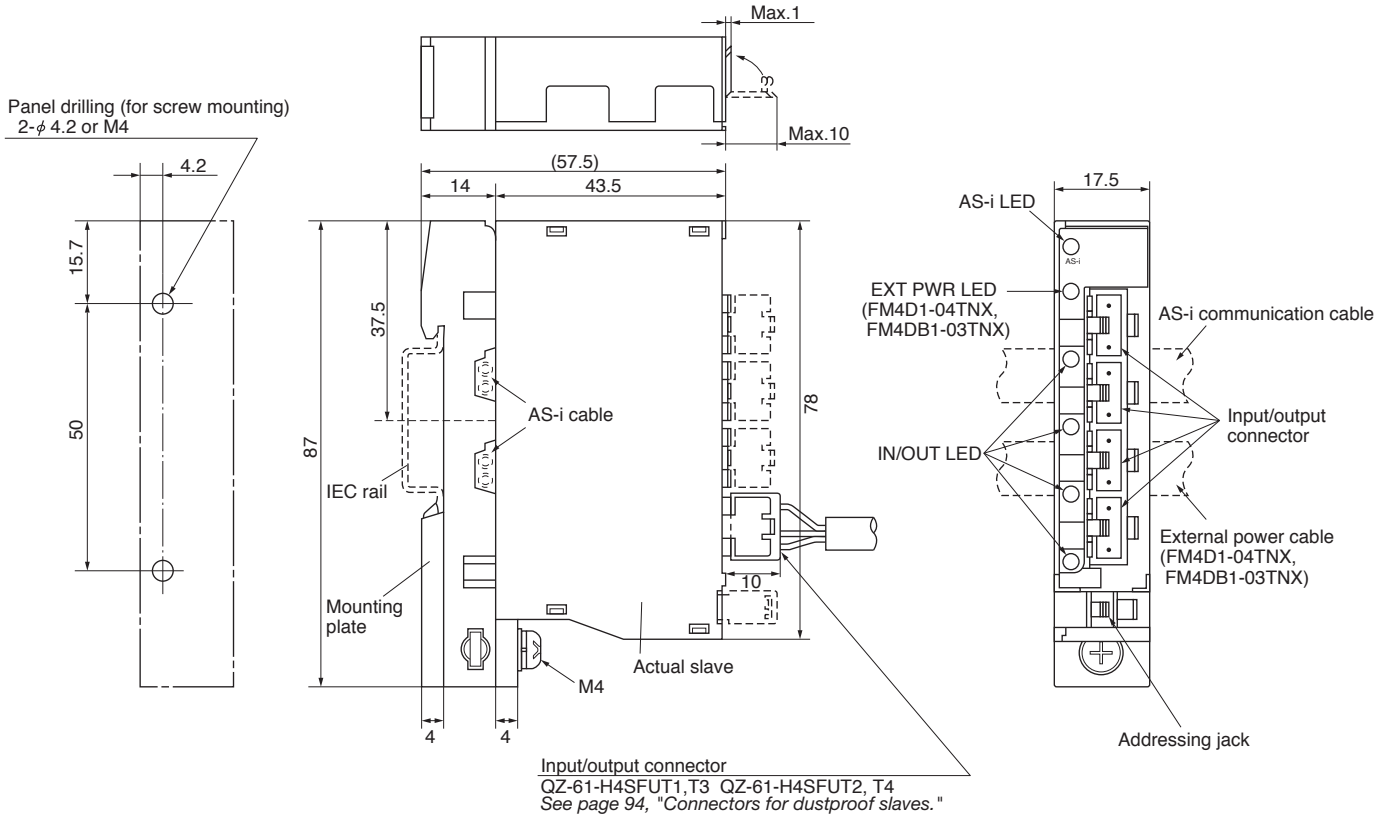
Applicable connector (applicable wire size)
- Manufacturer: Honda Tsushin Kogyo Co., Ltd.
- Type: QZ-61-H4SFUT1, T3 (0.08 to 0.2mm^2)
- Type: QZ-61-H4SFUT2, T4 (0.3mm^2)

See page 94, "Connectors for dustproof slaves."

■ Current carrying capacity for al inputs (per slave)



■ Dimensions, mm



■ Precautions on installation and wiring

- If a sensor with power consumption of more than 200mA is connected to the sensor power supply of the slave, the overload and short-circuit protective function will operate and the sensor power supply will be stopped even when 0.5ms has passed after the inrush current is generated. If a connected sensor has a high inrush current, make sure that current consumption with a lapse of 0.5 ms after the inrush current is 200 mA or less.
- Connect both the AS-i communication cable and the AS-i external power cable to the FM4D1-04TNX slave. There is no need to connect the AS-i external power cable to the FM4D1-40XXN. (As the FM4D1-40XXN's actual slave has no pins to pierce the AS-i external power cable, no problems will result even if you fix the actual slave to the mounting plate while placing the AS-i external power cable on the mounting plate.
- Care should be taken to avoid miswiring like reverse-wiring with regard to connection to external power supply (DC 24V).
  Products might be damaged or burnt out.

Compact terminal-block type slave, FM2D1

FM2D1-04RQX

■ Description

Compact terminal-block type slave with same size of RS4N, 6N relay-and-terminal modules

- Being capable of controlling 100V AC or 200V AC devices that have been in great demand than ever.
- Four relay outputs
- Extreme compact slave as its size is same as RS-4N, 6N relay-and-terminal modules.
- IEC rail/screw dual mounting type
- Four highly-reliable card relays of FUJI's RB104-DE (250V AC, 5A) are built in. Card relays are replaceable.
- Provided with IP20 terminal cover (finger protection) of IEC standards
- The 24V DC power source of the card relays is supplied from AS-i communications cable.
- The LED indicators show the I/O device's operation status.
- The slave's faulty will be indicated by LED indicator.
- AS-i specification: V2.0

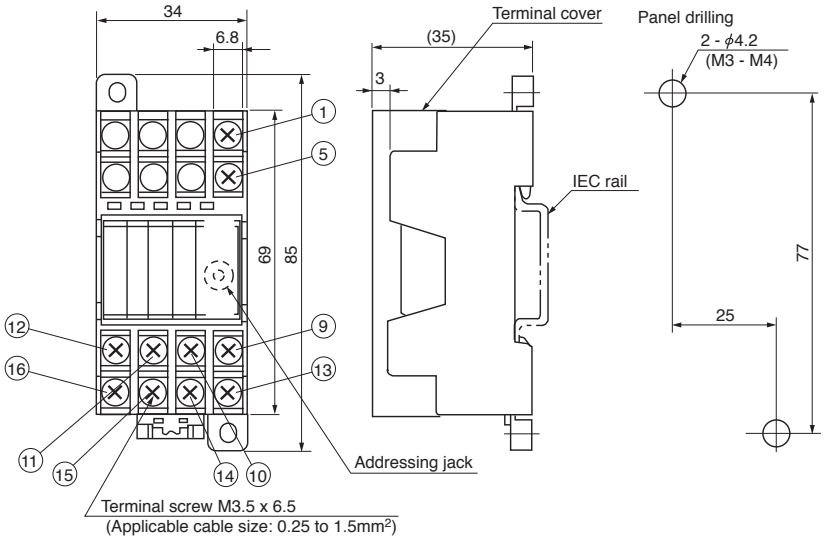
■ Ratings and specifications

Type		**FM2D1-04RQX**
Slave type		Standard slave
Number of inputs/outputs		4 outputs (Relay)
AS-Interface profile (I/O, ID)		8.0
Operating voltage (in accordance with AS-i specification)		26.5 to 31.6V
Current consumption		Max. 60mA
LED indication	AS-i	Green on: Normal operation, Red on: Communication error, Red on and Orange (Green+Red) on alternating: Slave has address=0, Off: Power Off
	OUT1 to OUT4 (Yellow)	On/off: Output on/off
Output (per point)	Type of built-in relay	RB104-DE (NO)
	Contact arrangement	1NO x 4-output
	Contact resistance (before use)	30mΩ or less
	Contact material	Ag alloy (Au-plated)
	Minimum operating voltage and current	0.1V DC, 0.1mA
	Rated continuous current	5A (In the case of side-by-side mounting, derate the current down to 3A or less)
	Max. making and breaking capacities	250V AC 5A, 30V DC 5A
	Operating time (at rated voltage)	10ms or less
	Reset time (at rated voltage)	10ms or less
	Insulation resistance (initial)	100MΩ or more with 500V DC megger
	Dielectric strength	Between same pole contacts: 750V AC, 1min Between different pole contacts: 2000V AC, 1min
	Vibration resistance	10 to 55Hz, duble amplitude 1mm for 2 hours in each direction of X, Y, Z
	Shock resistance	100m/s^2 for 3 times in each direction of X, Y, Z
	Mechanical durability	20 million operations or more
	Electrical durability	100000 operations: 220V AC (ind. load), Making 2A (pf 0.7), Breaking 2A (pf 0.3 to 0.4) 130000 operations: 220V AC (resistive load), Making 3A (pf 1), Breaking 3A (pf 1) 150000 operations: 24V DC (ind. load), Making 1A (L/R 15ms), Breaking 1A (L/R 15ms) 100000 operations: 24V DC (res. load), Making 5A (L/R 1ms or less), Breaking 5A (L/R 1ms or less)
Degree of protection (IEC 60529)		IP20
Operating temperature		–25 to 55˚C (no icing or no condensation)
Relative humidity		85% or less RH (no condensation)

■ Ratings and specifications (continued)

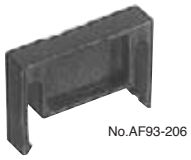
Electrical protection for AS-i connection	Reverse polarity protection	Built-in
	Electrostatic discharge resistance	Contact discharge method: ±4kV Aerial discharge method: ±8kV, IEC 61000-4-2 (Class B)
	Electromagnetic field noise immunity	80 to 1000MHz, Electric field strength: 10V/m, IEC61000-4-3 (Class A)
	Burst noise	2kV (Class B)/1kV (Class A), IEC61000-4-4
Mass		Approx. 70g
Addressing method		Can be done with an addressing unit (FL1HA-E) via an addressing cable (FX9Y002) connected to the addressing jack on the front of the slave. Connecting the addressing cable to a slave will disconnect the slave from the AS-i connection.
Assignment od data bits		
Data bit D0		Output 1
Data bit D1		Output 2
Data bit D2		Output 3
Data bit D3		Output 4

■ Dimensions, mm



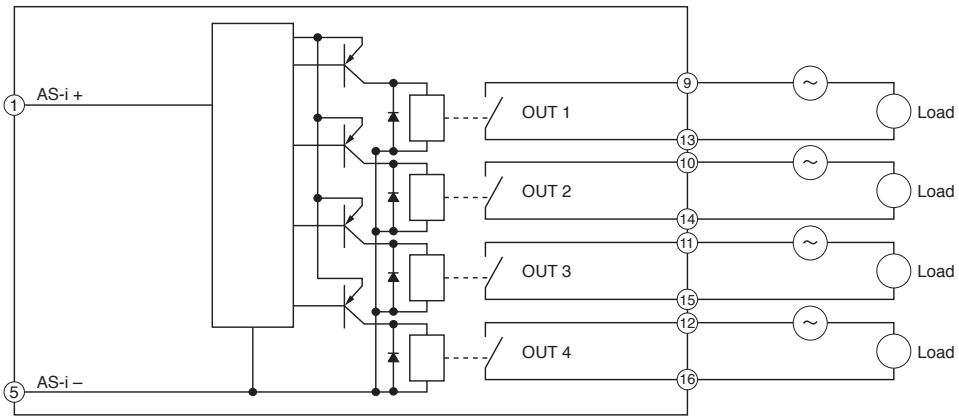
■ Relay remover

Use the relay remover (type TY3) for exchanging relays. Remove and insert relays perpendicularity to the socket surface. Diagonal removing or insertion may bend the relay terminals or damage the sockets.



TY3 (RZ3A)

■ Wiring diagram



Terminal block type slave, FM1D

■ Description

The screw terminal connection of the FM1D slave helps to reduce control panel wiring.

- Short-circuit protection and overload protection are provided for the sensor power supply.
- IEC rail mounting
- The slave is addressed with an addressing jack located on the front of the slave.
- Conforms to EC Directive (No. 89/336/EEC); EN50081-1, EN50082-2.
- AS-i specification: V2.0

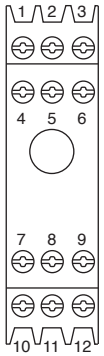
AF99-102

FM1D-22TPP

■ Ratings and specifications

Type			**FM1D-22TPP**	**FM1D-22RQP**
Slave			Standard	
Number of inputs/outputs			2 inputs / 2 outputs (PNP)	2 inputs / 2 outputs (Relay)
AS-Interface profile (I/O, ID)			3, 0	3, 0
Operating voltage (in acc. with AS-Interface specification)			26.5 to 31.6V DC	
Current consumption (including sensors)			50mA DC or less	50mA DC or less
LED indication G: Green R: Red Y: Yellow	AS-i (G/R)		G on: Power on, R on and G alternating: slave has address = 0, R on: failure, R flashing: input power overload	
	IN1, IN2 (Y)		On/off: input on/off	On/off: input on/off
	OUT1, OUT2 (Y)		On/off: output on/off	On/off: output on/off
Input	On voltage On current (sink) Off current		10V or more 5mA or less 1.5mA or less	
Sensor power supply via AS-Interface	Short-circuit and overload protection Sensor voltage range Current carrying capacity for all inputs		— 20 to 30V (I ≦ 25mA) 25mA (Ta ≦ 75˚C)	— 20 to 30V (I ≦ 25mA) 25mA (Ta ≦ 60˚C)
Output (per point)	Type of output		Electronics (PNP)	Relay contact
	External power supply (range)		24V DC (20 to 30V)	230V AC
	Current carrying capacity, per point	Average Minimum (DC12/DC13) Minimum (AC15)	2A 1.4A (24V DC) —	6A 1A (24V DC), 0.1A (230V DC) 3A (230V AC)
	Residual voltage		0.8V or less	—
	Response frequency	Res. load Ind. load	200Hz 2Hz	20Hz 1Hz
	Short-circuit and inductive surge protection		Built-in	—
	Inductive surge protection		Built-in	—
	Output status on communication error		Off	Off
Operating temperature			–25 to +70˚C (no icing or no condensation)	–25 to +60˚C (no icing or no condensation)
Storage temperature			–40 to +85˚C (no icing or no condensation)	
Electrical protection for AS-i connection	Reverse polarity protection Electrostatic discharge resistance Electromagnetic field noise immunity Burst noise		Built-in Contact discharge method: ±4kV, Aerial discharge method: ±8kV, IEC61000-4-2 (Class B) 80 to 1000MHz, Electric field strength: 10V/m, IEC61000-4-3 (Class A) 4kV (Class B) /1kV (Class A), IEC61000-4-4	
Shock resistance	IEC rail mounting (IEC68-2-27)		150m/s^2 (11ms)	
Vibration resistance	IEC rail mounting (IEC68-2-6)		10 to 55Hz, 0.5mm one-way amplitude	
Mass			Approx. 150g	
Addressing	Method		Can be done with an addressing unit (FL1HA-E) via addressing cable (FX9Y002) connected to the addressing jack on the slave front. Connecting the addressing cable to a slave will disconnect the slave from the AS-i connection.	
	Number of times (Addresses: between 1 and 31)		15 times. After the 15th address, the slave keeps the last address (in accordance with Slave ASIC (SAP4.0) specifications).	
Approval			CE	

■ Terminal arrangement and logic assignment

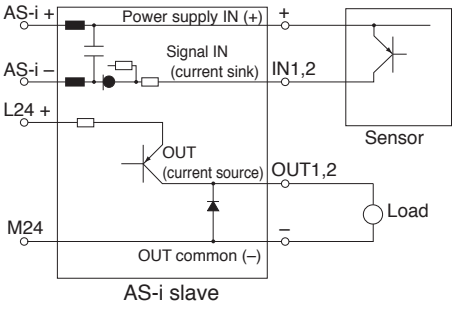


Terminal		FM1D-22TPP	
Symbol	No.	Description	Logic assignment
AS-i–	1	AS-i power supply (–)	
+	2	Power supply IN (+)	
+	3	Power supply IN (+)	
AS-i +	4	AS-i power supply (+)	
IN1	5	Signal IN 1 (current sink)	Data bit D0
IN2	6	Signal IN 2 (current sink)	Data bit D1
L24+	7	External power supply 24V DC (+)	
OUT1	8	OUT 1 (current source)	Data bit D2
OUT2	9	OUT 2 (current source)	Data bit D3
M24	10	External power supply 0V	
–	11	OUT common (–)	
–	12	OUT common (–)	

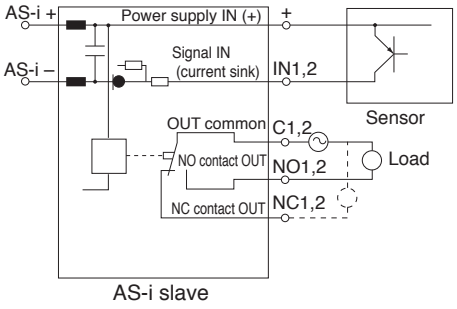
Terminal		FM1D-22RQP	
Symbol	No.	Description	Logic assignment
AS-i–	1	AS-i power supply (–)	
+	2	Power supply IN (+)	
+	3	Power supply IN (+)	
AS-i +	4	AS-i power supply (+)	
IN1	5	Signal IN1 (current sink)	Data bit D0
IN2	6	Signal IN2 (current sink)	Data bit D1
NC1	7	NC contact OUT1	Data bit D2
C1	8	OUT common 1	
NO1	9	NO contact OUT1	Data bit D2
NC2	10	NC contact OUT2	Data bit D3
C2	11	OUT common 2	
NO2	12	NO contact OUT2	Data bit D3

■ Wiring diagrams

FM1D-22TPP

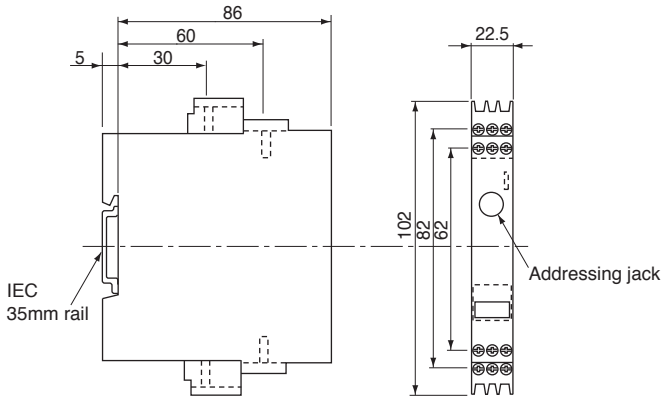


FM1D-22RQP



■ Dimensions, mm

FM1D-22TPP, FM1D-22RQP



Type of cable	Solid wire or stranded wire
Cable size	0.5 to 2.5mm^2
Cable insertion length	7mm
Tightening torque	0.5 to 0.6N•m

■ Precaution on wiring

Core should be taken to avoid miswiring like reverse-wiring with regard to connection to external power supply (24V DC). Products might be damaged or burnt out.

AS-i motor starter slave, FE16D

■ Description

The FE16D slave incorporates a reversing motor starter for up to 2.2kW, having a sturdy IP65 structure to make it suitable for severe environmental conditions. The FE16D can be used outside the control panel, thus helping to reduce the number of relay boxes and the size of the panel.

- The starter slave can be easily connected to the AS-Interface flat cable by insulation piercing connectors.
- The power cable can be easily connected by a single-action connector.
- A translucent door, which can be padlocked, simplifies addressing and resetting.
- Designed for versatile application, with a motor range of 0.1 to 2.2kW at 200V AC and a thermal overload relay range of 0.1 to 7A.
- AS-i specification: V2.0

KK01-136A

FE16D-SJ13RGNE12

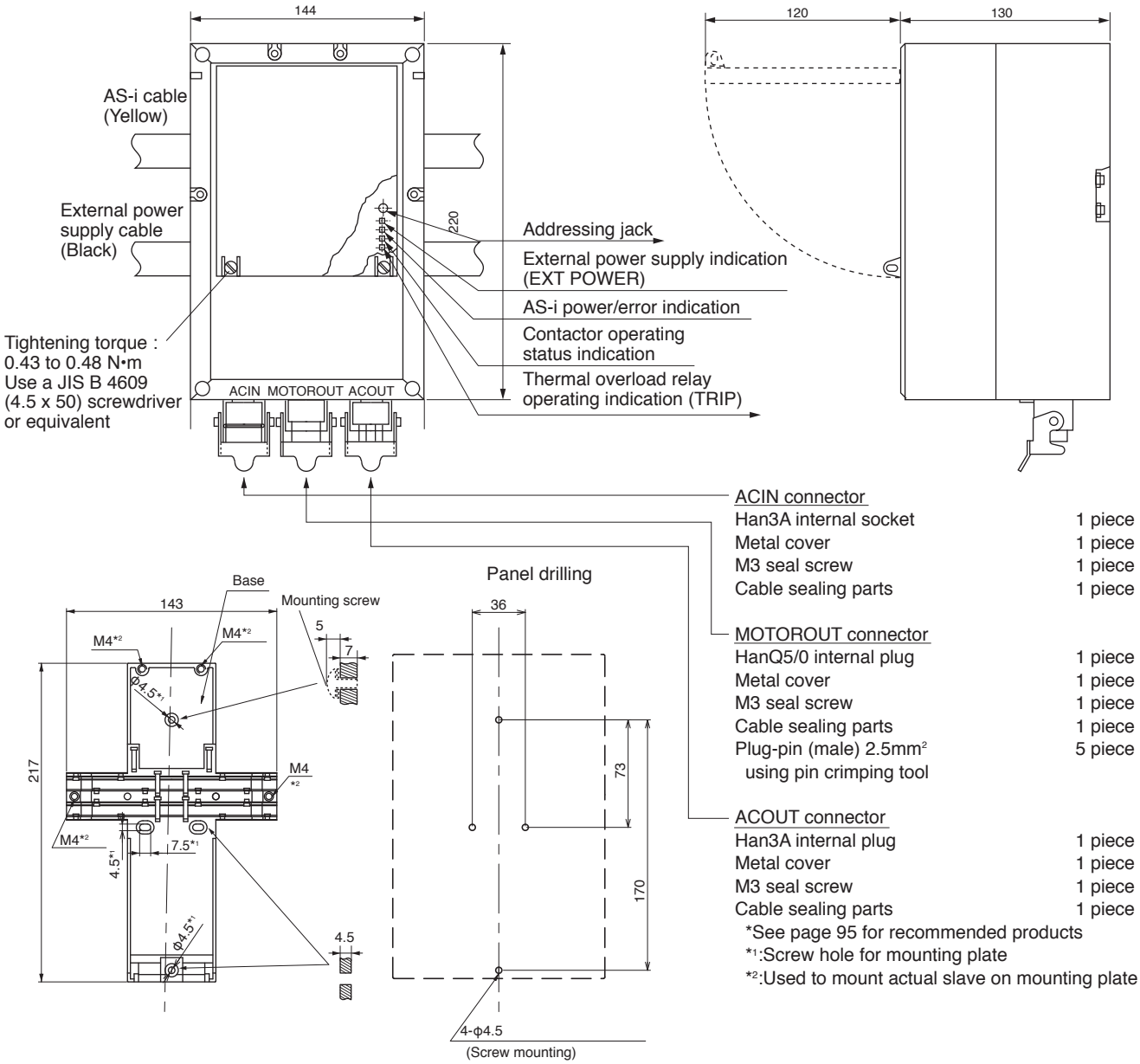
■ Ratings and specifications

Type		**FE16D-SJ13RG∗E12 □□■**
Built-on thermal overload relay: *		N: TR-0NZ716, E: TK-0NZ716
Motor capacity: □□ …20 to 25 (0.1 to 2.2kW) Heat element: ■ …A to V (0.1-0.15A to 7.0-11.0A) at 200V AC		□□■ / □□■ 0.1kW 0.1-0.15A 20 A / 0.4kW 1.4-2.2A 22 M 0.15-0.24A 20 C / 1.7-2.6A 22 N 0.24-0.36A 20 E / 0.75kW 2.2-3.4A 23 P 0.36-0.54A 20 G / 2.8-4.2A 23 R 0.48-0.72A 20 H / 1.5kW 4.0-6.0A 24 S 0.2kW 0.64-0.96A 21 J / 5.0-8.0A 24 T 0.8-1.2A 21 K / 2.2kW 6.0-9.0A 25 U 0.95-1.45A 21 L / 7.0-11.0A 25 V
Slave type		Standard slave
Number of inputs/outputs		4 inputs /4 outputs (IN3, IN4, OUT3, OUT4: not in use)
AS-Interface profile (I/O, ID)		7, F
Operating voltage (in acc. with AS-Interface specification)		26.5 to 31.6V DC
Current consumption		50mA DC or less
LED indication G: Green R: Red Y: Yellow	AS-i	G on: normal communication, R on and Orange (G+R) on alternating: slave has address = 0, R on: Communication error, Off: AS-i power off
	EXT POWER	G on/off: External power on/off
	MOTOR	Y on/off: Magnetic contactor non-excited/excited
	TRIP	Y on/off: Thermal overload relay tripped/normal
Input	On voltage	10V or more
	Off voltage	6V or less
	On current	Approx. 5mA
	Off current	1.5mA or less
Built-in power supply via AS-Interface	Short-circuit and overload protection	—
	Voltage range (contact input)	20 to 30V (I ≦ 25mA)
	Current carrying capacity for allinputs	25mA (Ta ≦ 55˚C)
Built-in magnet driving output	External power supply	24V DC (20.4 to 28.8V)
	Type of output	PNP transistor
	Current carrying capacity	0.2A
	Voltage drop	1.5V or less
	Short-circuit protection	—
	Inductive surge protection	Built-in
	Output status on communication error	Off

■ Ratings and specifications (Continued)

Magnetic motor starter	Main circuit rating	200V AC, 10A
	Built-in magnetic motor starter *	N: SJ-06WGRM reversing type or E: SJ-06WGRM/2E reversing type
	Auxiliary contact arrangement	2 x (1NO+2NC)
	Coli rated voltage (range)	24V DC (85 to 120% of rated voltage)
	Power consumption	1.4W
	Life expectancy (AC3)	1 million (electrically), 10 million (mechanically)
	TOR heat element	16 types, *see page 84*
Input signal		IN1: MC coil exciting status (data bit: D0) 0: Exciting (FWD/REV), 1: Non exciting IN2: TOR operation (data bit: D1) 0: Normal 1: Trip IN3: Not in use (data bit: D2) IN4: Not in use (data bit: D3)
Output signal		OUT1: Coil drive (FWD) (data bit: D0) 0: Off, 1: On OUT2: Coil drive (REV) (data bit: D1) 0: Off, 1: On OUT3: Not in use (D2) OUT4: Not in use (D3)
Degree of protection (IEC60529)		IP65
Connector for power cable		*See page 95* for recommended cables.
Operating temperature		0 to +55˚C (no icing or no condensation)
Storage temperature		–25 to +70˚C (no icing or no condensation)
Connection of communication cable		Via yellow AS-i cable by piercing connector
External power supply method		Via black AS-i cable by piercing connector
Electrical protection for AS-Interface	Reverse polarity protection	Built-in
	Electrostatic discharge resistance	Contact discharge method: ±4kV, Aerial discharge method: ±8kV, IEC61000-4-2 (Class B)
	Electromagnetic field noise immunity	80 to 1000MHz, Electric field strength: 10V/m, IEC61000-4-3 (Class A)
	Burst noise	2kV (Class B)/1kV (Class A), IEC61000-4-4
Shock resistance (IEC68-2-27)		50m/s2 (11ms)
Vibration resistance (IEC68-2-6)		10 to 55Hz, 0.25mm one-way amplitude
Mass		Approx. 2.2kg (including mounting plate)
Addressing method		Can be made with an addressing unit (FL1HA-E) via addressing cable (FX9Y002) connected to the addressing jack on the slave front. Connecting the addressing cable to a slave will disconnect the slave from the AS-Interface.
Approval		CE

■ Dimensions, mm



ACIN connector

Han3A internal socket	1 piece
Metal cover	1 piece
M3 seal screw	1 piece
Cable sealing parts	1 piece

MOTOROUT connector

HanQ5/0 internal plug	1 piece
Metal cover	1 piece
M3 seal screw	1 piece
Cable sealing parts	1 piece
Plug-pin (male) 2.5mm^2 using pin crimping tool	5 piece

ACOUT connector

Han3A internal plug	1 piece
Metal cover	1 piece
M3 seal screw	1 piece
Cable sealing parts	1 piece

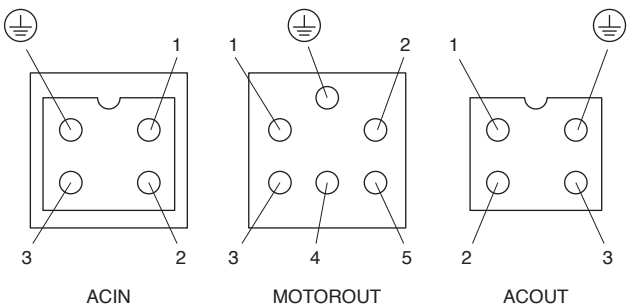
*See page 95 for recommended products

*1:Screw hole for mounting plate

*2:Used to mount actual slave on mounting plate

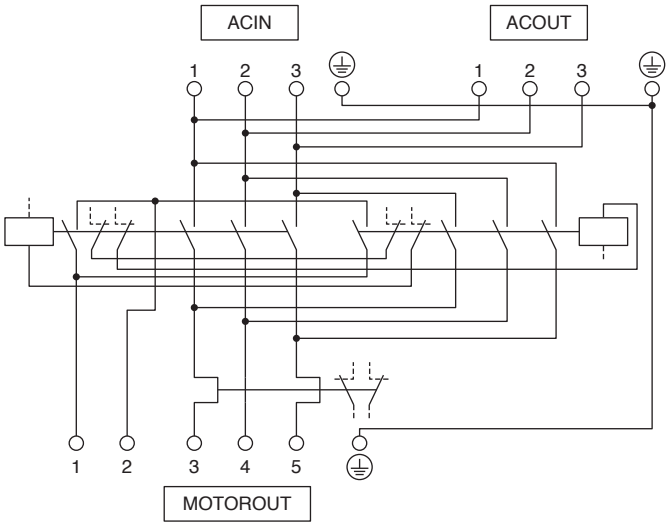
■ Pin arrangement

	Pin No.	Name
ACIN	1	L1
	2	L2
	3	L3
	GND	GND
MOTOROUT	1	Aux. contact NO output
	2	Aux. contact NO output
	3	T1
	4	T2
	5	T3
	GND	GND
ACOUT	1	L1
	2	L2
	3	L3
	GND	GND

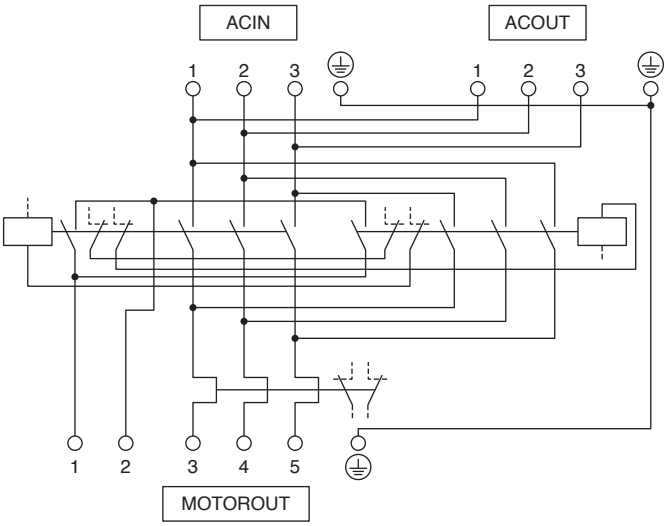


■ Internal circuit

・Type FE16D-SJ13RGNE12 □□■

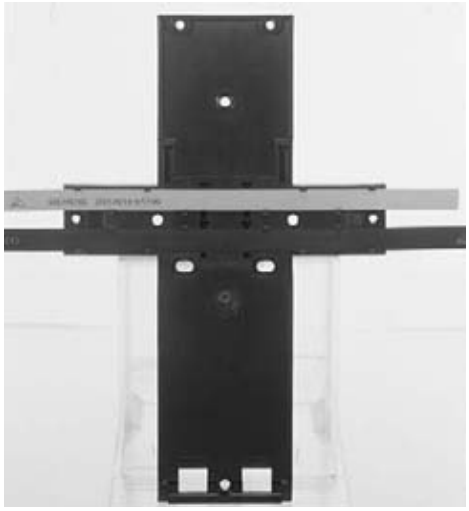


・Type FE16D-SJ13RGEE12 □□■



■ How to fit AS-i cable on mounting plate

- Place a yellow AS-i communication cable on the upper (AS-i) side of the mounting plate.
- Place a black AS-i external power cable on the lower (EXT POWER) side.



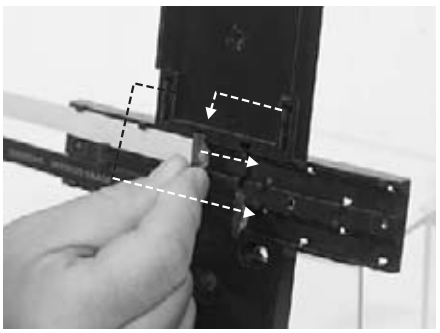
The cables have polarity. Place correctly the cables to match the cable's cross section and the groove of the mounting plate.

■ Precautions on wiring

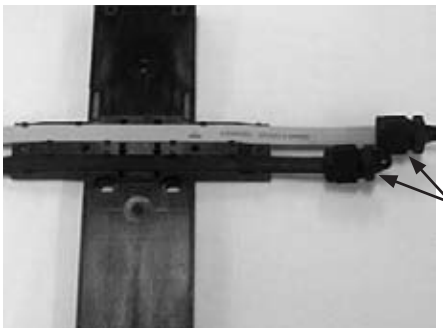
- Care should be taken to avoid mis-wiring like reverse-wiring with regard to connection to external power supply (24V DC).
  Products might be damaged or burnt out.

■ Cable termination

- When the starter slave has to be connected at the AS-i cable end, remove the spacer from the mounting plate to attach it to the cable end.



Never fail to attach the spacer to prevent foreign objects coming in.



Attach a cable-end piece (3RK1901-1MN00)

Where waterproof is required (IP65, IP67, etc.)

Digital picking slave, FM4DP

■ Description

A multi-purpose slave with a 2-digit, 7-segment display and illuminated pushbutton switch.

- An excellent user interface achieved with a dedicated FB (function block) combining FUJI's PLC and MICREX-SX.
- Ideal for small- and medium-scale digital picking systems.
- A 2-core type made possible with AS-interface communications, featuring two 7-segment displays and a brightly illuminated pushbutton switch.
- Layout changes can be made using the AS-i's flexible wiring method without requiring manufacturer-authorized engineers, thus contributing to a considerable reduction in total costs during the customer's product life cycle.
- Like other slaves, advanced piercing technology is used for AS-i cable connection, allowing the cable to be crimped and connected with ease.

FM4DP2 KK04-009

- The pushbutton switch has a positive clicking feel and distinctive coloring.
- Features a connector port for adding limit switches.
- Conforms to AS-i specifications V2.0, V2.1.

■ Ratings and specifications, with 7-segment display

Type	7-segment display 7-segment display with spotlight		**FM4DP2-GR1G** **FM4DP2-GR1GS**	**FM4DP2-GR1R** **FM4DP2-GR1RS**	**FM4DP2-RR1R** **FM4DP2-RR1RS**	**FM4DP2-RR1G** **FM4DP2-RR1GS**
Slave type			Standard			
Display color	10's digit		Green	Green	Red	Red
	1's digit		Red	Red	Red	Red
Pushbutton illuminated color			Green	Red	Red	Green
AS-i profile (I/O, ID)			7, F			
Control voltage (depending on AS-i specifications)			26.5 to 31.6V Supplied from AS-i line (with no external power supply required)			
Current consumption			75mA max. (with "88" displayed on 7-segment indicator and illuminated pushbutton switch ON) 45mA max. (with 7-segment indicator and illuminated pushbutton switch turned OFF)			
Display	AS-i		Green LED ON: AS-i power supply turned ON (Normal operation) Red LED and orange (red mixed with green) LED lit alternately: address 0 Red LED ON: Communications error			
	Illuminated pushbutton switch		Illuminated color: Green (24mm dia.)	Illuminated color: Red (24mm dia.)		Illuminated color: Green (24mm dia.)
	7-segment	1's digit character height	13 to 14mm (red)	13 to 14mm (red)	13 to 14mm (red)	
		10's digit character height	13 to 14mm (green)	13 to 14mm (green)	13 to 14mm (red)	
Input signal			NO contact (illuminated pushbutton switch)			
Output signal			• Illuminated pushbutton switch ON • 7-segment-indicator (4-bit output from AS-i slave IC is processed in microcomputer and displayed)			
Logic allocations			Input *1		Output	
			Type	Data bit	Type	Data bit
			Pushbutton switch and side connector *2	D0	Illumination and spotlight *3	D0 to D3
					7-segment	D0 to D3
Degree of protection			IP40			
Pushubutton switch		Operation force	1.1 to 1.7N			
		Durability	3,000,000 (at a switching speed of 3,600 times/h with a maximum operation force of 2N)			
		Control structure strength	Operating direction 30N (with no deformation of the control structure or operation errors)			
Temperature		Operating temperature range	–10°C to +40°C			
		Storage temperature range	–25°C to +70°C			
Operating ambient humidity			35 to 85% (with no condensation)			
Electrical protection for AS-i connection		Reverse polarity protection	Built in			
		Electrostatic discharge resistance	Contact discharge method: ±4kV; Aerial discharge method: ±8kV; IEC61000-4-2 (Class A)			
		Electromagnetic field noise	80 to 1000MHz, electric field strength: 10 V/m, IEC61000-4-3 (Class A)			
		Burst noise	2kV (Class B)/1kV (class A), IEC61000-4-4			
Shock resistance			Screw mounting: 300 m/s^2 (18 ms), IEC68-2-27			
Vibration resistance			Screw mounting: 10 to 55 Hz, 1.0mm one-way amplitude, IEC68-2-6			
Mounting pipe diameter			27 to 30mm dia.			

Notes: *1 An input signal with a minimum duration of 150 ms is accepted normally. If the duration is less than 150 ms, the input will not always be accepted.
*2 The pushbutton switch and the two-pin connector on the side of the unit are connected in parallel. Two-pin connector is not provided with spotlight-integrated picking slaves.
*3 A illuminated pushbutton and spotlight are connected in series.

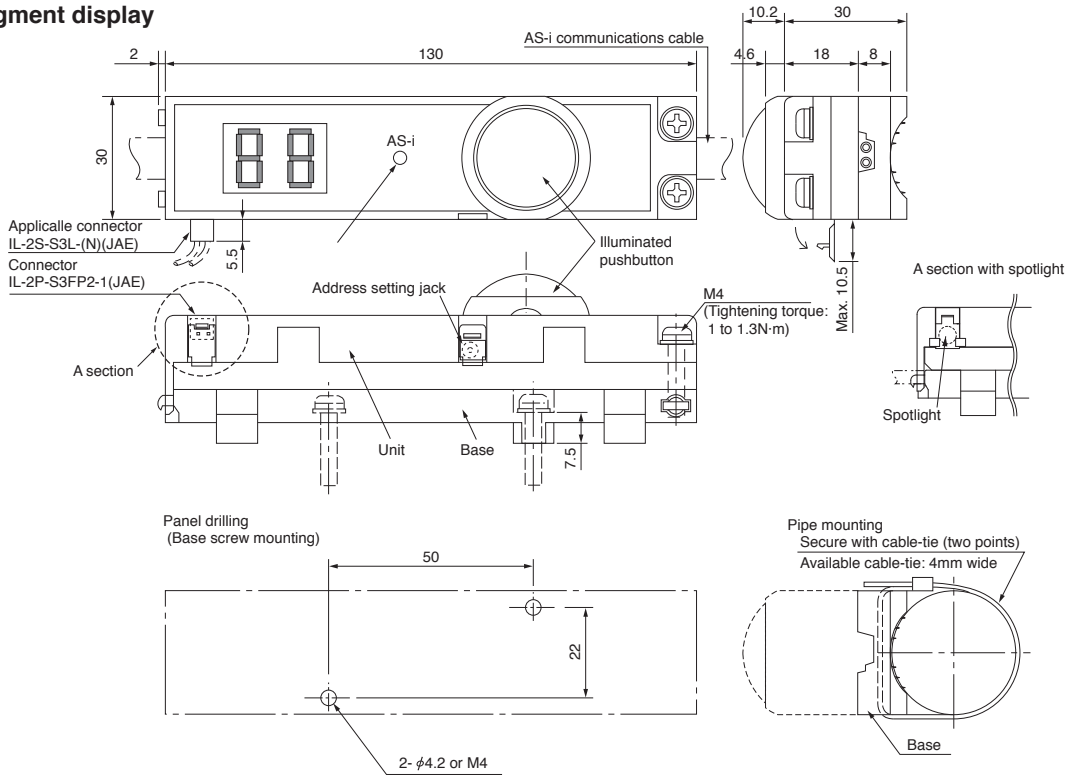
■ Ratings and specifications, with illuminated pushbutton

Type	Illuminated pushbutton Illuminated pushbutton with spotlight		**FM4DP0-001G** **FM4DP0-001GS**		**FM4DP0-001R** **FM4DP0-001RS**	
Slave type			A/B slave			
AS-i profile (I/O, ID, ID2)			7, A, F (The initial value of ID1 is 7, Variable from 0 to 7)			
Control voltage (depending on AS-i specifications)			26.5 to 31.6V Supplied from AS-i line (with no external power supply required)			
Current consumption			65mA max. (with illuminated pushbutton switch ON) 45mA max. (with illuminated pushbutton switch turned OFF)			
Display	AS-i		Green LED ON: AS-i power supply turned ON (Normal operation) Red LED and orange (red mixed with green) LED lit alternately: address 0 Red LED ON: Communications error			
	Illuminated pushbutton switch		Illuminated color: Green (24mm dia.)		Illuminated color: Red (24mm dia.)	
Input signal			NO contact (illuminated pushbutton switch)			
Output signal			• Illuminated pushbutton switch ON			
Logic allocations			Input		Output	
			Type	Data bit	Type	Data bit
			Pushbutton switch and side connector *1	D0	Illumination and spotlight *2	D1
Degree of protection			IP40			
Pushubutton switch		Operation force	1.1 to 1.7N			
		Durability	3,000,000 (at a switching speed of 3,600 times/h with a maximum operation force of 2N)			
		Control structure strength	Operating direction 30N (with no deformation of the control structure or operation errors)			
Temperature		Operating temperature range	–10°C to +40°C			
		Storage temperature range	–25°C to +70°C			
Operating ambient humidity			35 to 85% (with no condensation)			
Electrical protection for AS-i connection		Reverse polarity protection	Built in			
		Electrostatic discharge resistance	Contact discharge method: ±4kV; Aerial discharge method: ±8kV; IEC61000-4-2 (Class A)			
		Electromagnetic field noise	80 to 1000MHz, electric field strength: 10 V/m, IEC61000-4-3 (Class A)			
		Burst noise	2kV (Class B)/1kV (class A), IEC61000-4-4			
Shock resistance			Screw mounting: 300 m/s^2 (18 ms), IEC68-2-27			
Vibration resistance			Screw mounting: 10 to 55 Hz, 1.0mm one-way amplitude, IEC68-2-6			
Mounting pipe diameter			27 to 30mm dia.			

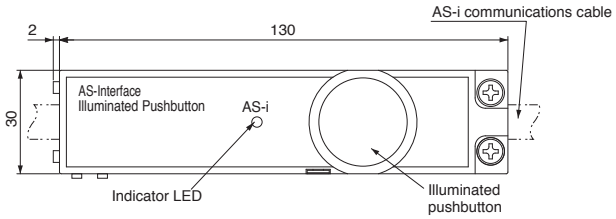
Notes: *1 The pushbutton switch and the two-pin connector on the side of the unit are connected in parallel. Two-pin connector is not provided with spotlight-integrated picking slaves.
*2 A illuminated pushbutton and spotlight are connected in series.

■ Dimensions, mm

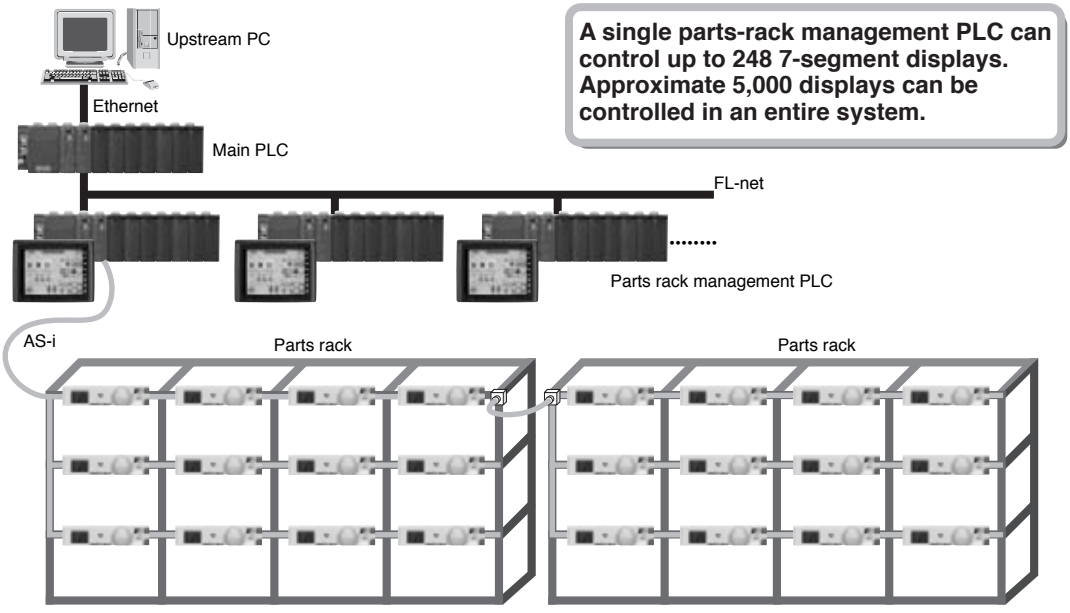
• 7-segment display



• Illuminated pushbutton



■ System configuration example



A single parts-rack management PLC can control up to 248 7-segment displays. Approximate 5,000 displays can be controlled in an entire system.

FRN□□□C1S-■AJ
Inverters connectable to AS-Interface Network

■ Overview

- Conformity with various power voltages worldwide
  (1-phase 100V, 1-phase 200V, 3-phase 200V, 3-phase 400V)
- Applicable motor capacity
  0.1kW to 3.7kW
- Easy setting, simple wiring
- Conformity with IP20

■ Functions

Input signal
4-bit input acceptable
Bitwise function allocation can be made by function code data setting.
- Forward rotation, stop command
- Reverse rotation, stop command
- Alarm reset signal
- Multi-frequency selection
- Acceleration/deceleration time selection
- Coast-to-stop command
- Jogging operation
  Any of the above functions is selectable.

Optimized functions best suited for traversing conveyance
High starting torque (150% or more)
Braking unit built-in (0.4kW or more)
Braking resistor built-in model (Semi-standard)
Trip-free operation (Current limiting function)

Output signal
2-bit outputs can be issued.
Bitwise function allocation can be made by function code data setting.
- Alarm output (for any fault)
- Running signal
- Frequency arrival signal
- Current limiting signal
- Motor overload early warning signal
- Low level current detection signal
  Selective allocation from the functions above

Three types of function code data settings
Keypad
Remote keypad with data copy function (Option)
Inverter loader software

■ Model variation

Nominal applied motor (kW)	Input power			
	3-phase 200V	3-phase 400V	1-phase 200V	1-phase 100V
0.1	○	—	○	○
0.2	○	—	○	○
0.4	○	○	○	○
0.75	○	○	○	○
1.5	○	○	○	—
2.2	○	○	○	—
3.7	○	○	—	—