

AFPX-C38AT

1 Features, Functions and Restrictions

1.1 FPX-C38AT Control Units

Product no.	Specifications				
	No. of I/O points	Power supply	Input	Output	Connection
Transistor type (NPN)					
AFPX-C38AT	24/14	100 to 240V AC	24V DC (Common polarities + & - common)	Transistor (NPN)	Terminal block

1.2 FP-X Expansion Unit

Input unit

Product no.	No. of I/O points	Power supply	Input	Connection
AFPX-E16X	16/0	-	24 V DC ±COM terminal	Terminal block

Output unit

Product no.	No. of I/O points	Power supply	Output	Connection
AFPX-E14YR	0/14	-	Relay	Terminal block

In/output unit

Relay types

Product no.	No. of I/O points	Power supply	Input	Connection
AFPX-E16R	8/8	-	24 V DC ±COM terminal	Terminal block
AFPX-E30R	16/14	100 to 240 AC		
AFPX-E30RD		24V DC		

Transistor types (NPN)

Product no.	No. of I/O points	Power supply	Input	Connection
AFPX-E16T	8/8	-	24 V DC ±COM terminal	Terminal block
AFPX-E30T	16/14	100 to 240 AC		
AFPX-E30RTD		24V DC		

Transistor types (PNP)

Product no.	No. of I/O points	Power supply	Input	Connection
AFPX-E16P	8/8	-	24 V DC ±COM terminal	Terminal block
AFPX-E30P	16/14	100 to 240 AC		
AFPX-E30RPD		24V DC		

1.3 FP-X Expansion FP0 Adapter

Input unit

Specifications	Product no.
Designed to connect FP0 expansion units to the FP-X. Supplied with an 8cm expansion cable and a power supply cable.	AFPX-EFP0

1.4 Add-on Cassettes

Communication cassettes

Specifications	Product no.
1-channel unit with a 5-wire RS232C port	AFPX-COM1
2-channel unit with two 3-wire RS232C port	AFPX-COM2
1-channel unit with a 2-wire RS485/4-wire RS422 port (insulated)	AFPX-COM3
2-channel unit with a 2-wire RS485 port (insulated) and a 3-wire RS232C port non insulated)	AFPX-COM4
1-channel unit with an Ethernet interface and a 3-wire RS232C port (non-insulated).	AFPX-COM5
2-channel unit with two 2-wire RS485 ports (insulated; non-insulated between channels)	AFPX-COM6

Application cassettes

Name	Specifications	Product no.
FP-X analog input cassette	2-channel analog input (non insulated)	AFPX-AD2
FP-X analog output cassette	2-channel analog output (insulated, insulated between channels)	AFPX-DA2
FP-X analog I/O cassette	2-channel analog input (insulated, non-insulated between channels) + 1-channel analog output (insulated)	AFPX-A21
FP-X thermocouple cassette	2-channel thermocouple input (insulated, insulated between channels)	AFPX-TC2
FP-X RTD cassette	2-channel RTD input (insulated, insulated between channels)	AFPX-RTD2
FP-X input cassette	8-point DC input	AFPX-IN8
FP-X output cassette	8-point DC output (NPN, 0,3 A)	AFPX-TR8
	6-point DC output (PNP, 0,8 A)	AFPX-TR6P
FP-X I/O cassette	4-point DC input + 3-point transistor output (NPN, 0,3 A)	AFPX-IN4T3
FP-X pulse I/O cassette	2-channel high-speed counter + 1-channel pulse output	AFPX-PLS
FP-X master memory cassette	Master memory + real-time clock	AFPX-MRTC

1.5 Restrictions on Unit Combinations

Restrictions on the simultaneous use of cassettes.

The simultaneous use of certain add-on cassettes is restricted due to increased current consumption.

When the current output of an analog cassette is used:

Cassette types	Number of cassettes	●: permitted, X: prohibited, ▲: minor restriction.
AFPX-DA2	1	●
	2	▲ ^{note1)}
AFPX-A21	1	●
	2	●
AFPX-DA2 + AFPX-A21	1+1	▲ ^{note1)}
AFPX-DA2 + AFPX-COM5	1+1	X ^{note2)}
AFPX-A21 + AFPX-COM5	1+1	X ^{note2)}
AFPX-A21 + AFPX-DA2 + AFPX-COM5	1+1+1	X ^{note2)}
AFPX-DA2 + AFPX-COM5	1+1	X ^{note2)}
AFPX-A21 + AFPX-COM5	2+1	X ^{note2)}

Note 1) Up to 2 channels can be used with the current output. (When using two cassettes, it is possible to use one cassette with the 2-channel current output and one cassette with the 2-channel voltage output.)

Note 2) AFPX-DA2 and AFPX-A21 cannot be used with AFPX-COM5 (Ethernet).

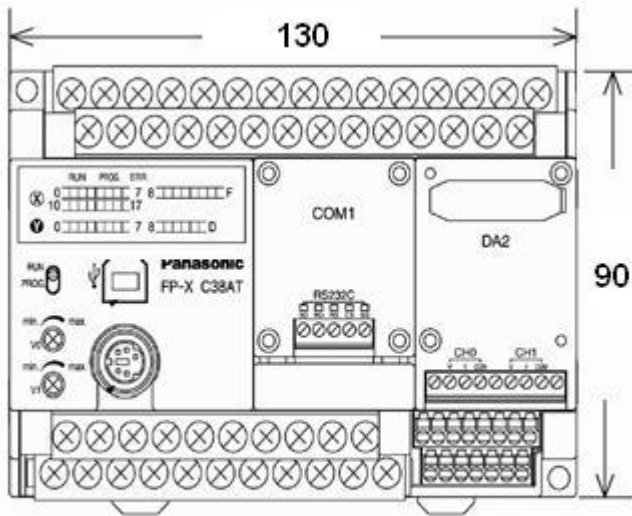
When the current output of an analog cassette is used: ^{Note 1)}

Cassette types	Number of cassettes	●: permitted, X: prohibited, ▲: minor restriction.
AFPX-DA2	1	●
	2	●
AFPX-A21	1	●
	2	●
AFPX-DA2 + AFPX-A21	1+1	●
AFPX-DA2 + AFPX-COM5	1+1	●
AFPX-A21 + AFPX-COM5	1+1	●
AFPX-A21 + AFPX-DA2 + AFPX-COM5	1+1+1	●
AFPX-DA2 + AFPX-COM5	1+1	●
AFPX-A21 + AFPX-COM5	2+1	●

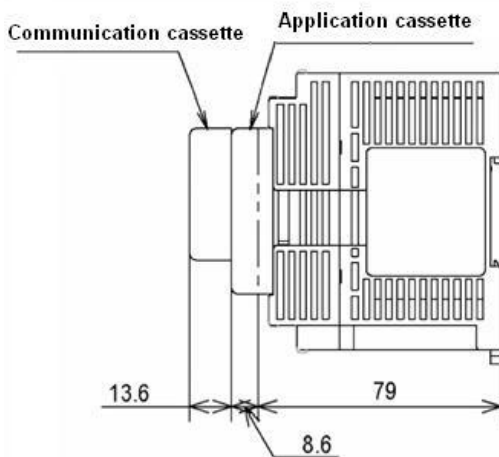
Note 1) When the output current is $\leq 1\text{mA}$. For higher output currents (1-10mA), the table for current output applies.

2. Dimensions

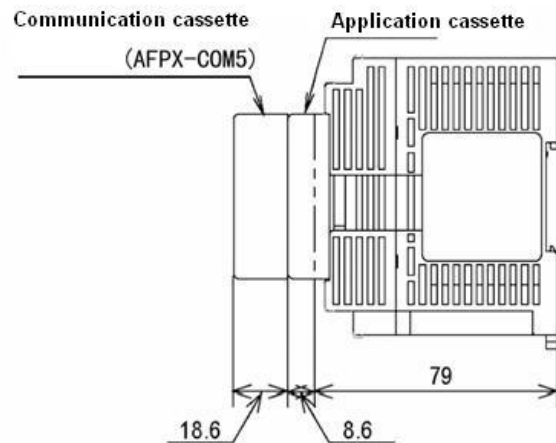
2.1 CPU



2.2 CPU with communication cassette



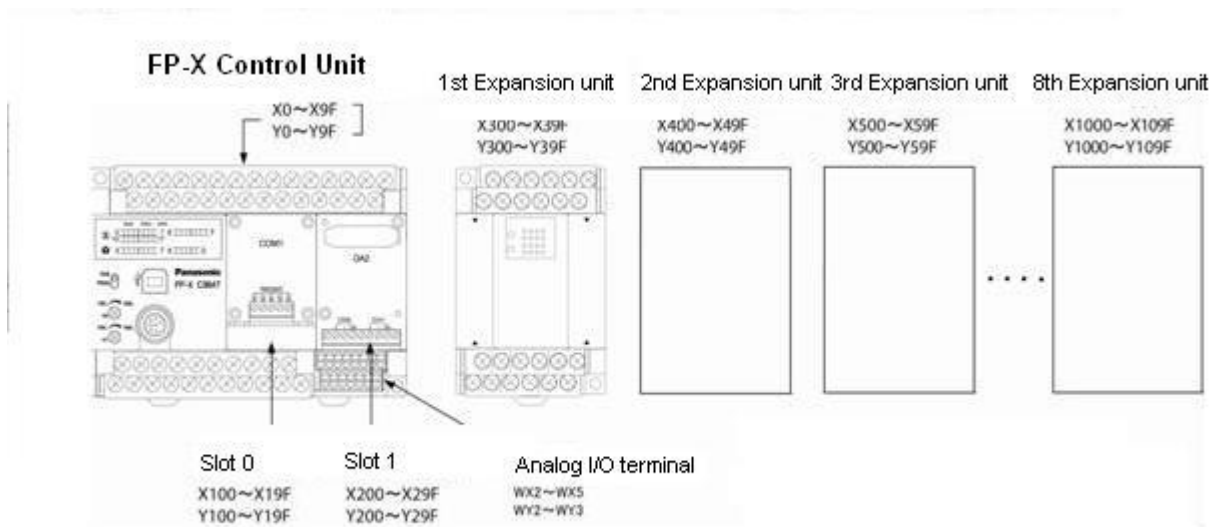
● Communication cassette AFPX-COM5



3. Allocation

3.1 General

I/O allocation is performed automatically when an expansion unit is added and is determined by the installation location. The I/O allocation of the FP-X CPU is fixed.



Unit	Input	Output
Control unit	X0~X9F (WX0~WX9) Note) WX2-WX5 are analog input	Y0~Y9F (WY0~WY9) Note) WY2-WY3 are analog output
Cassette mounting part 1 (Slot 0)	X100~X19F(WX10~WX19)	Y100~Y19F(WY10~WY19)
Cassette mounting part 2 (Slot 1)	X200~X29F(WX20~WX29)	Y200~Y29F(WY20~WY29)
Expansion 1st unit	X300~X39F(WX30~WX39)	Y300~Y39F(WY30~WY39)
Expansion 2nd unit	X400~X49F(WX40~WX49)	Y400~Y49F(WY40~WY49)
Expansion 3rd unit	X500~X59F(WX50~WX59)	Y500~Y59F(WY50~WY59)
Expansion 4th unit	X600~X69F(WX60~WX69)	Y600~Y69F(WY60~WY69)
Expansion 5th unit	X700~X79F(WX70~WX79)	Y700~Y79F(WY70~WY79)
Expansion 6th unit	X800~X89F(WX80~WX89)	Y800~Y89F(WY80~WY89)
Expansion 7th unit	X900~X99F(WX90~WX99)	Y900~Y99F(WY90~WY99)
Expansion 8th unit	X1000~X109F (WX100~WX109)	Y1000~Y109F (WY100~WY109)

Note) The ranges of the I/O numbers which are actually used differ depending on the cassettes and units

- Restriction of extension units number
Basically, FP-X allows to expand up to 8 units, however there is some restriction according to expansion unit.

AFPX-E16: Do not use two unit in a row because it needs external power supply. This unit does not equip the power supply, therefore install this unit right hand side of control unit or AFPX-E30.

AFPX-E30: There is no restriction for this unit, therefore it's possible to expand up to 8 units in a row.

AFPX-EFP0: The only one unit can be installed at end of the expansion bus.

In the case of install AFPX-E16 or AFPX-E30, these units should be put left hand side of AFPX-EFP0.

- Total length of extension cable.
The total length should be less than 160cm.

4. Specification

4.1. General specification

Item	Specifications		
Ambient temperature	0 - +55°C		
Storage temperature	-40 - +70°C		
Ambient humidity	10 – 95% RH (at 25°C non condensing)		
Storage humidity	10 – 95% RH (at 25°C non condensing)		
Breakdown voltage note1)	Transistor type	Input terminal ⇔ output terminal ^{note4)}	500V AC for 1min
		Input terminals ⇔ Power supply terminal/Function earth	2300V AC for 1min ^{note2)}
		Output terminals ⇔ Power supply terminal/Function earth	
		Cassette input/output terminal ⇔ Power supply terminal/Function earth ^{note3)}	
		Cassette input/output terminal ⇔ Input terminals/Output terminals	500V AC for 1min
		Cassette RS485/Ethernet terminal ⇔ Power supply terminal/Power supply terminal/Function earth ^{note3)}	
		Power supply terminal ⇔ Function earth	
Insulation resistance	Input terminals ⇔ Output terminals ^{note4)}	Min. 100Ω (measured with a 500V DC meter)	
	Input terminals ⇔ Power supply terminal/Function earth		
	Output terminals ⇔ Power supply terminal/Function earth		
	Cassette input/output terminal ⇔ Power supply terminal/Function earth ^{note3)}		
	Cassette input/output terminal ⇔ Input terminals/Output terminals		
	Cassette RS485/Ethernet terminal ⇔ Power supply terminal/Power supply terminal/Function earth ^{note3)}		
	Power supply terminal ⇔ Function earth		
Vibration resistance	5–9Hz, 1 cycle/min: single amplitude of 3.5mm 9–150Hz, 1 cycle/min: constant acceleration of 9.8m/s ² , 10min on 3 axes		
Shock resistance	147m/s ² , 4 times on 3 axes		
EMC	1500Vp-p, with pulse widths 50ns and 1μs (based on in-house measurements)		
Operating conditions	Free from corrosive gases and excessive dust		
Conformity to CE Directives	EMC: EN61131-2, LVD: EN61131-2		
Overvoltage category	II		
Pollution level	2		
Weight	ca 500g		

Note1) No isolation between input terminals and TOOL port, USB port, analog input cassette and RS232C terminal of the communication cassette.

Note 2) Cutoff current: 5mA

Note 3) Does not apply to input and output terminals of the pulse I/O cassette.

Note 4) Does not apply

4.2 Consumption current

Type of unit	CPU power supply	
	100V AC	200V AC
AFPX-C38AT	≤ 350mA	≤ 220mA

4.3 Performance Specification

Transistor type

Item		Specifications
Number of I/O points	CPU	38 (24 CD inputs, 14 transistor outputs)
	With E16 I/O expansion units	Max. 54
	With E30 I/O expansion units (max. 8)	Max. 278
	With FP0 expansion units (max. 3)	Max. 134
Programming method/Control method		Relay symbol/cyclic operation
Program memory		Built-in F-ROM (without backup battery)
Program capacity (steps)		32000
Number of instructions	Basic instruction	111
	High-level instruction	216
Operation speed		0.32μs/step (for basic instruction)
I/O refresh time, Base time:		With E16: Base time + (0.34ms X no. of units) With E30: Base time + (0.47ms X no. of units) With expansion FP0 adapter: Base time + 1.4ms + I/O refresh time of FP0 expansion ^{unit1)}
Operation memory: Relays	External input relays (X)	1760 (X0–X109F) ^{note2)}
	External output relays (Y)	1760 (Y0–Y109F) ^{note2)}
	Internal relays (R)	4096 (R0–R255F)
	Special internal relays (R)	192
	Timer relays/Counter relays (T/C)	1024 ^{note3)} Factory setting timers: 1008 points (T0–T1007) Factory setting counters: 16 points (C1008–C1023) Timer: 1–32767 (in units of 1ms, 10ms, 100ms, or 1s). Counter: 1–32767
	Link relays (L)	2048 (L0–L127F)

Item		Specifications
Operation memory: register	Data register (DT)	32765 words (DT0 – DT32764)
	Special data registers (DT)	384 words
	Link registers (LD)	256 (LD0 – LD255)
	Index registers (I)	14 (I0 – I14)
Differential points		Unlimited
Master control relay points (MCR)		256
Number of labels (JP and LOOP)		256
Number of SFC steps		1000 stages
Number of subroutines		500
Number of interrupt programs		8 external inputs 1 periodical interrupt
Sampling trace		1000 samples Per scan or per time interval Max. 16 Boolean variables and 3 16-bit variables per sampling
Comment memory		328kByte (backup battery not required)
PLC link function		Max. 16 units, link relays: 1024, link registers: 128 words (Data transmission and remote programming is not possible.)
Clock/calendar function		(year, month, day, hour, minute, second and day of week) ^{note6)}
High-speed counter (CPU) ^{unit4}	1-phase	8 channels High-speed: 1 channel: 100kHz 2 channels: 80kHz each 3 channels: 60kHz each 4 channels: 50kHz each Medium-speed: 4 channels (10kHz each)
	2-phase	4 channels High-speed: 1 channel: 35kHz 2 channels: 25kHz each Medium-speed: 2 channels (5kHz each)
Pulse output/PWM output (CPU) ^{unit5)}		4 channels High-speed: 2 channels (100kHz each or composite speed for linear interpolation) Medium-speed: 2 channels (20kHz each or composite speed for linear interpolation) High-speed: 1.5Hz–41.7kHz Medium-speed: 1.5Hz–15.6kHz Resolution 1000: output frequency ≤12.5kHz Resolution 100: output frequency >12.5kHz
Pulse catch inputs/interrupt inputs		8 CPU: 8 (X0–X7)
Periodical interrupt		0.5ms–30s
Potentiometer inputs		2, resolution 10bits (0–1000)

Item		Specifications
F-ROM backup <small>note7)</small>	Using Instructions F12 and P13	Data registers (32765 words)
	Automatically when power is cut off	Counter relays: 16 (1008–1023) <small>note8)</small> Internal relays: 128 (WR248–WR255) Data registers: 55 words
Battery backup		Additional hold areas specified in the system registers will be saved if the optional battery is installed <small>note9)</small>
Battery life		Min. 1.8. Typical lifetime in actual use: 10 years at 25°C <small>note11)</small>
Other functions		Editing in RUN mode, constant scan, on/off forcing of inputs/outputs, password protection, upload protection, floating-point operation, PID processing

Note1) I/O refresh time of FP0 expansion units:

8 I/O: number of units used x 0.8ms

16 I/O: number of units used x 1.0ms

32 I/O: number of units used x 1.3ms

64 I/O: number of units used x 1.9ms

Note 2) The actual number of points available for use depends on the hardware configuration.

Note 3) The number of points can be increased by using an auxiliary timer.

Note 4) These are the specifications when the rated input voltage is 24V DC at 25°C. The frequency will decrease depending on voltage, temperature or usage condition.

Note 5) The maximum frequency varies depending on the use.

Note 6) Accuracy:

- At 0°C: error ≤104s/month.

- At 25°C: error ≤51s/month.

- At 55°C: error ≤155s/month

Note 7) Writing is possible up to 10000 times. When the optional battery is used, the entire area can be backed up.

Areas to be held and not to be held can be specified in the system registers.

Note 8) The status of the counter output and the elapsed value (EV) of the counter are backed up. The setting value (SV) is not held.

Note 9) If the battery is empty or no battery is present and additional hold areas have been defined, the hold/non-hold operation becomes unstable.

Note 10) The actual lifetime may be shorter than the typical lifetime depending on the usage conditions.

Note11) More than 2 batteries can be installed, which increases the battery life correspondingly.

4.4 Names and Principle Applications of the Ports

The TOOL port is provided as a standard feature of the FP-X. The ports on the communication cassette are treated as COM port 1 and COM port 2. The principle applications of the various ports are described below. The USB port is allocated to COM port 2

Port name	Availability		Communication modes
	USB used ^{note1)}	USB not used	MEWTOCOL-COM Slave ^{note2)} Program controlled (in RUN mode only) ^{note3)}
Tool port	Standard equipment (mini-DIN 5-pinconnector)		
COM1 port	Only with communication cassette		MEWTOCOL-COM Master/Slave Program controlled PLC Link Modbus RTU Master/Slave
COM2 port		Only with communication cassette	MEWTOCOL-COM Master/Slave Program controlled Modbus RTU Master/Slave
	Standard equipment		MEWTOCOL-COM Slave

Note1) Please note the restrictions on communication cassettes when using the USB port

Note 2) The master function cannot be used with the TOOL port.

Note 3) In PROG mode, the TOOL port is automatically set to MEWTOCOL-COM mode even if program controlled mode has been selected. This way it is always possible to communicate in PROG mode with a programming software like FPWIN Pro.

Note 4) The USB port is allocated to COM port 2.

Restrictions when Using the USB Port

The USB port is allocated to COM port 2. The functions of the communication cassettes are restricted as below when the USB port is used.

The USB port is available as the default setting or when the system registers are initialized.

Cassette	USB port not used	USB port used
AFPX_COM1	1-channel unit with a 5-wire RS232C port	1-channel unit with a 3-wire RS232C port (RS/CS control is not possible)
AFPX_COM2	2-channel unit with two 3-wire RS232C ports	1-channel unit with a 3-wire RS232C port (Second channel cannot be used)
AFPX_COM3	No restrictions: 1-channel unit with a 2-wire RS485/4-wire RS422 port (insulated)	
AFPX-COM4	2-channel unit with a 2-wire RS485 port (insulated) and a 3-wire RS232C port (non-insulated)	1-channel unit with a 2-wire RS485 port (insulated) (RS232C cannot be used)
AFPX-COM5	1-channel unit with an Ethernet interface and a 3-wire RS232C port (non-insulated)	1-channel unit with an Ethernet interface (RS232C cannot be used)
AFPX-COM6	2-channel unit with two 2-wire RS485 ports (insulated; non-insulated between channels)	1-channel unit with a 2-wire RS485 port

Power Supply Specifications

AC power supply

Item	Specifications
Rated voltage	100 – 240V AC
Voltage regulation range	85–264V AC
Inrush current	(at 240V AC, 25°C) ≤40A
Momentary power off time	10ms (when using 100V AC)
Frequency	50/60 Hz (47–63Hz)
Leakage	current ≤0.75mA between: Input terminals function earth
Internal power supply part, guaranteed life	20000 hours (at 55°C)
Fuse Built-in	(cannot be replaced)
Insulation method	Transformer insulation
Terminal screw	M3

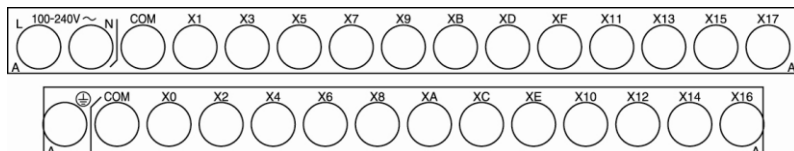
24V DC service power supply

Service power supply terminals are only available on units with AC power supply.

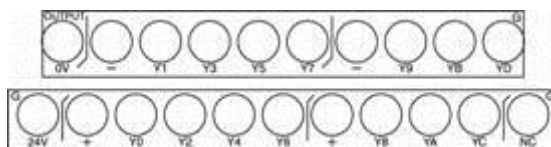
Item	Specifications
Rated output voltage	24V DC
Voltage regulation range	21.6–26.4V DC
Rated output current	0.4A
Overcurrent protection function	Available (see note)
Terminal screw	M3

Note) This function is meant to protect against overcurrent temporarily. A current load that is beyond the specifications may cause damage.

Input terminal



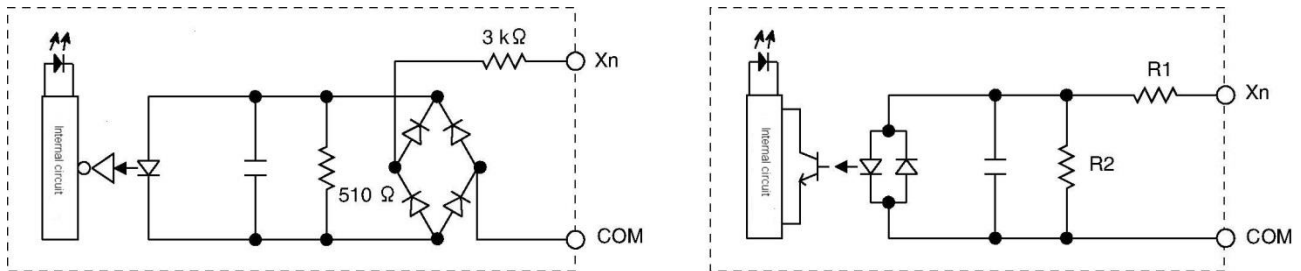
Output terminal



4.5 Input Specifications, NPN Transistor Types

Item	Description	
Insulation method	Optical coupler	
Rated input voltage	24V DC	
Operating voltage range	21.6–26.4V DC	
Rated input current	For X0–X3: $\approx 8\text{mA}$ For X4–X7: $\approx 4.7\text{mA}$ From X8: $\approx 4.3\text{mA}$	
Input points per common	Bundled 24 input per COMMON (non polar for input)	
Min. ON voltage/min. ON current	For X0–X3: 19.2V DC/6mA From X4: 19.2V DC/3mA	
Max. OFF voltage/max. OFF current	For X0–X3: 2.4V DC 1.3mA From X4: 2.4V DC/1mA	
Input impedance	For X0–X3: $\approx 3\text{k}\Omega$ For X4–X7: $\approx 5.1\text{k}\Omega$ From X8: $\approx 5.6\text{k}\Omega$	
Response time	FALSE \rightarrow TRUE	For input X0–X3: $\leq 135\mu\text{s}$: normal input $5\mu\text{s}$ high-speed counter input, pulse catch input, interrupt For input X4–X7: $\leq 135\mu\text{s}$: normal input $\leq 50\text{ms}$: high-speed counter input, pulse catch input, interrupt input From input X8: $\leq 0.6\text{ms}$
	TRUE \rightarrow FALSE	
Operation mode indicator	LEDs	
Applicable standards	Conforms to IEC61131-2 TYPE 3 (according to the above specifications)	

Note) This specification applies when the rated input voltage is 24V DC and the temperature is 25°C.



For X4–X7: R1=5.1k Ω , R2=3k Ω
From X8: R1=5.6k Ω , R2=1k Ω

4.6 Output Specifications, NPN Transistor Types

Item	Description	
Insulation method	Optical coupler	
Output Type	Open collector	
Rated load voltage	5-24V DC	
Operating load voltage range	4.75 – 26.4V DC	
Max. load current	0.5A	
Max. surge current	1.5A	
Input points per common	Bundled 8 output per COMMON (non polar for input)	
OFF state leakage current	≤1μA	
ON state voltage drop	≤0.3V DC	
Response time (at 25°C)	FALSE → TRUE	For input X0–X3: ≤2μs: (Load current: ≥15mA) For input X4–X7: ≤20μs: (Load current: ≥15mA) From input X8: ≤1ms:
	TRUE → FALSE	For input X0–X3: ≤8μs: (Load current: ≥15mA) For input X4–X7: ≤30μs: (Load current: ≥15mA) From input X8: ≤1ms:
External power supply for driving internal circuit (connected to + and – terminals)	Voltage	21.6–26.4V
	Current	Y0–Y5 (Y7): ≤60ms Y8–YF: ≤45ms
Surge absorber	Zener diode	
Operation mode indicator	LEDs	

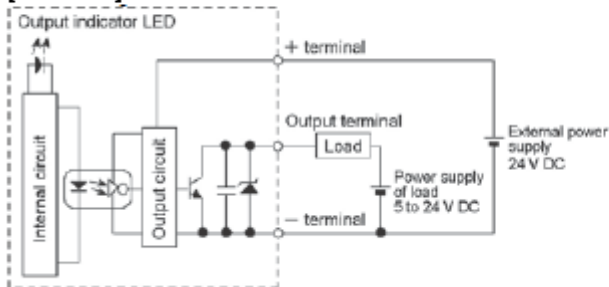
Note) This specification applies when the rated input voltage is 24V DC and the temperature is 25°C.

Internal circuit diagram

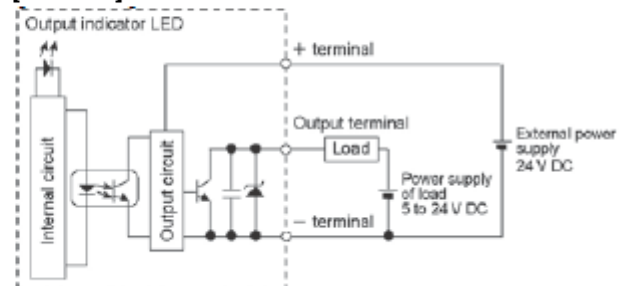
Circuit diagram

[NPN output]

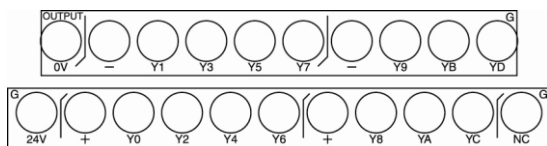
[Y0 to Y3]



[from Y4]



Output terminal

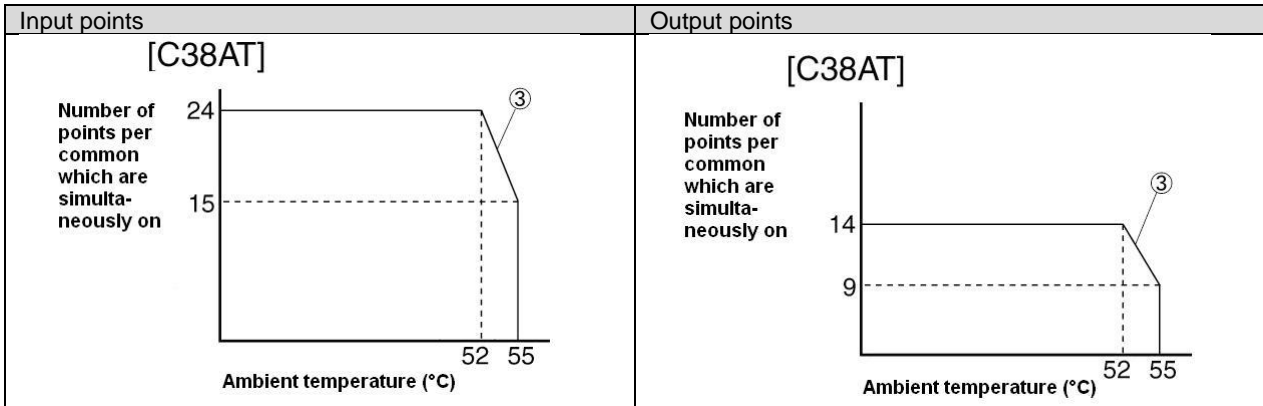


4.7 Number of Output Points Simultaneously TRUE

NPN Transistor Type, Stand-Alone and with AFPX-COM5

Input points	Output points
Not restriction	Not restriction

NPN Transistor Type, with AFPX-DA2 and -A21, Current Output



NPN Transistor Type, with AFPX-DA2 and -A21, Voltage Output

Input points	Output points
Not restriction	Not restriction

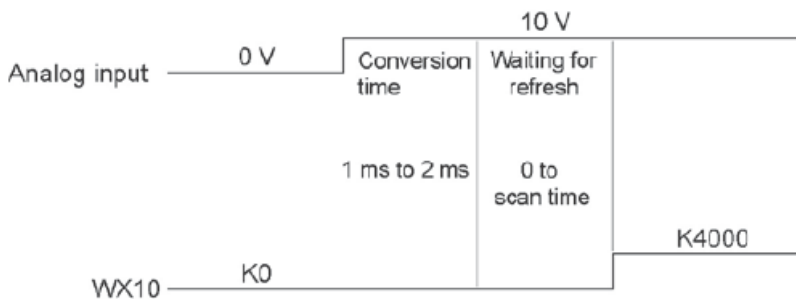
4.8 Analog input

Analog input specification

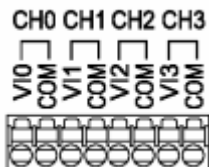
Item	Specifications	
Number of input points	4 channels	
Input range	Voltage	0 – 10V, 0 – 5V
	Current	0 – 20mA
Digital output range	0 to 4000	
Resolution	1/4000 (12 bits)	
Conversion time	1ms/channel	
Accuracy Max	±1% F.S. or less (0–55°C)	
Input impedance	Voltage	40Ω
	Current	250 Ω
Absolute maximum input	Voltage	-0.5V, +15V (for voltage input)
	Current	+30mA (for current input)
Insulation method	Analog input terminal – internal digital circuit : non insulation Analog input terminal – analog output terminal : non insulation Channel-to-channel : non insulation	

Note1) When the analog input values exceed the upper and lower limits, the digital values maintain the upper and lower limit values. As the resolution is 12 bits, the higher 4 bits of the input contact are always 0.

Note2) Following time is required to reflect the analog data in the input of the control unit.



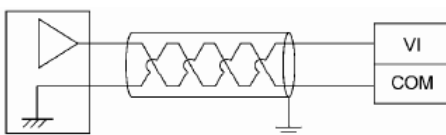
Terminal layout



Connection method

Voltage and current input

Analog device



Analog input setting

The configuration for the analog input channel is done in the user program (write a specified value to **WY1** set analog input range).

Analog input range (**WY1**)

The channels CH0, CH1, CH2 and CH3 are assigned to following 4 hexadecimal digits of WY1.

bit no.	15			12	11			8	7			4	3			1
channel no.	CH3				CH2				CH1				CH0			

Write hexadecimal numbers to set configuration for each channel:

0: not used 1: 0-10V 2: 0-5V 3: 0-20mA

Example) To set range 0-10V to CH0 and CH1 and 0-5V to CH2 and CH3 → write 16#2211 to WY1.

Attention: Only the first write access to WY1 (during the PLC program) to is effective. For setting a new configuration or range for the analog input, switch-off PLC and restart again.

Confirmation of the analog input range setting

Confirmation area (**WX7**) is set by system to confirm the setting for the analog input channel which is done in the user program.

Analog input confirmation (**WX7**)

The channels CH0, CH1, CH2, CH3 are assigned to following 4 hexadecimal digits of WX7.

bit no.	15			12	11			8	7			4	3			1
channel no.	CH3				CH2				CH1				CH0			

Confirmation of channel setting range:

H0: not used H1: 0-10V H2: 0-5V H3: 0-20mA

Confirmation of the analog conversion

Confirmation area (**WX6**) is set for each analog input value, when the analog input channel is active.

Analog value conversion monitor (**WX6**)

The channels CH0, CH1, CH2 and CH3 are assigned to following digits of WX6.

bit no.	15			12	11			8	7			4	3			1
channel no.													CH3	CH2	CH1	CH0

Channel status:

0: not active 1: active

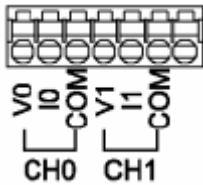
Analog Input Values

Channel number	Input area	Range
CH0	WX2(X20~X2F)	0~4000
CH1	WX3(X30~X3F)	
CH2	WX4(X40~X4F)	
CH3	WX5(X50~X5F)	

4.9 Analog output

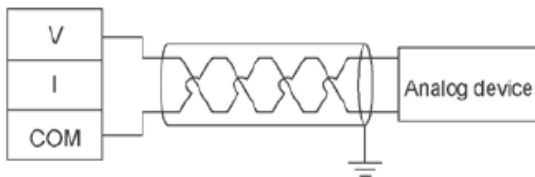
Item	Specifications	
Number of output points	2 channels	
Output range	Voltage	0 – 10V
	Current	0 – 20mA
Digital input range	0–4000 (see note 1)	
Resolution	1/4000 (12 bits)	
Conversion time	1ms/channel	
Accuracy Max	±1% F.S. (0–55°C)	
Input impedance	0.5Ω (Voltage output)	
Max. output current	10mA (Voltage output)	
Allowable load resistance	≤500Ω (current output)	
Insulation method	Analog input terminal – internal digital circuit : non insulation Analog input terminal – analog output terminal : non insulation Channel-to-channel : non insulation	

Terminal layout

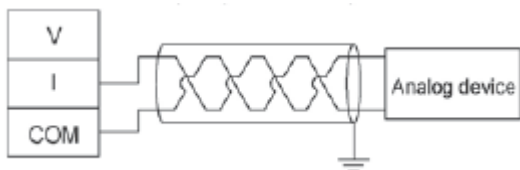


Connection method

With voltage output (0-10V/0-5V)



With current output (0-20mA)

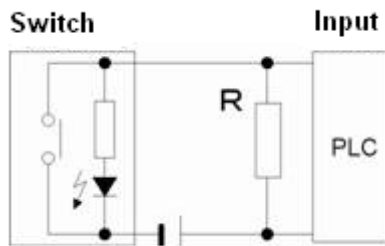


Analog Output Values

Channel number	Output area	Range
CH0	WY2(X20~X2F)	0~4000
CH1	WY3(X30~X3F)	

5 Clue for Input and Output Wiring

- In the case of use the switch with leakage current for the input, it may cause glimmering LED lighting on the switch. To solve this, it is recommended to add bleeder resistor(R) in parallel shown in below.



- In case of the inductive load, add the surge absorbing device as parallel to the load shown in below.
- In the case of relay output for DC inductive load, generally surge absorbing devices give longer life, therefore add the 'diode' to load in parallel.

