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# Directional Control Solenoid Valve

# KT Series (EtherCAT and Profinet)

# KT3/ KT5 Manifold Bus Interface Module (Profinet, EtherCAT)


## SPECIFICATION

| | |
|---|---|
| Project Specification | Profinet , EtherCAT |
| Control Power Supply | 24VDC +-10% |
| Output Power Supply | 24VDC +-10% |
| Internal Friction Current | Less than100 mA |
| Output Points | 24 Points |
| Output Load | Single Valve 24V 1W Output, 24 Valves Maximum Output Current 1.5A; |
| Output Polarity | PNP,-COM |
| Version | Version 2.4, Conformance Class CC-C |
| Addressing mode | DCP |
| Voltage Detection | Support Voltage Detection |
| Reverse Connection Protection and Over-voltage Protection | Support |
| IRT | YES |
| MRP | YES |
| Diagnose | YES |
| Communication Rate | 100M bps |
| Communication Port | Use M12( Meet Profinet Specification) |
| Communication Connection Type | Daisy Chain |
| Set File | GCD File |
| Authentication | EN 61000-6-4:2007+A1:2011, EN IEC 61000-6-2:2019 |
| EMI | CLASS A |
| Power Interruptions | More than 10ms |
| Withstand Voltage | GB/T24344, 500 VAC for one minute |
| Insulation Resistance | GBT24343, 500VDC Voltage, Insulation at least 10 MΩ |
| Vibration Measurement | 5G, 10~150Hz, Continuous Vibration test for 2 hours |
| Working Temperature | -10~50℃ |
| Working Humidity | 35-85%RH |

# How To Order

KT5 ① PN ② – 08 ③ □ ④ T6 ⑤ – S ⑥ 4 ⑦ D ⑥ 4 ⑦ – □ ⑧

**1.** Model Series
KT3
KT5

**2.** Protocol types
PN : Profinet
EC : EtherCAT

**3.** Combination
02-24

**4.** Inlet Port
Blank-1/4

**5.** Outlet Port
T4 : Φ4 Quick connector
T6 : Φ6 Quick connector

**6.** Valve Type
S: 5/2 Single Coil
D: 5/2 Double Coil
C: 5/3 Double coil center close type
E: 5/3 Double coil center exhaust type
P: 5/3 Double coil center pressure type

**7.** Valve Quantity
2-24 As Per Valve Type

**8.** Blank : With indicator light, surge and voltage protection
R : With indicator light, no surge and voltage protection

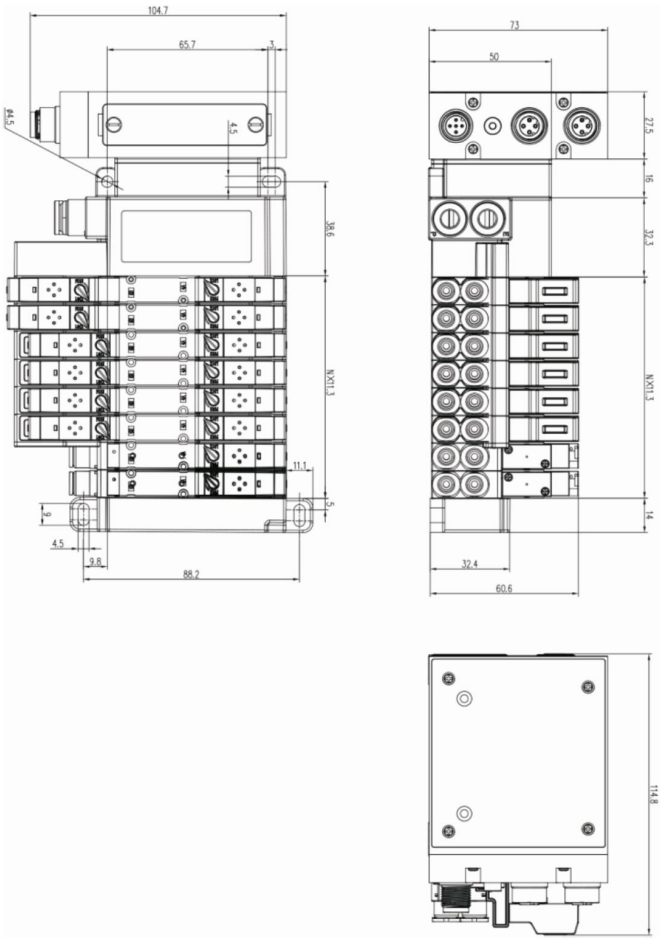
## Separate Valve Ordering Code

KT5 – □
① ②

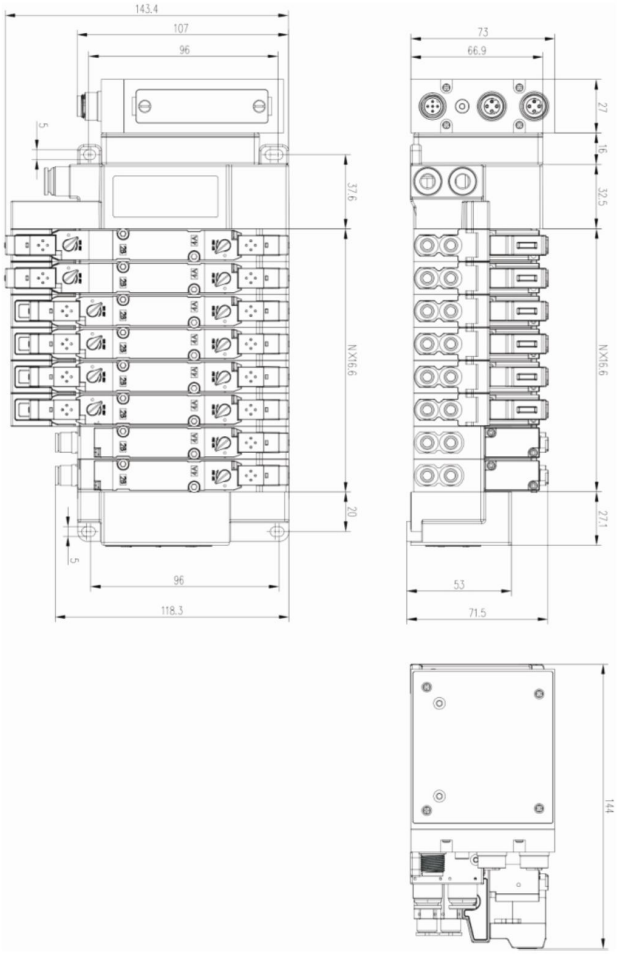
**1.** Model Series
KT3
KT5

**2.** Valve Type
S: 5/2 Single Coil
D: 5/2 Double Coil
C: 5/3 Double coil center close type
E: 5/3 Double coil center exhaust type
P: 5/3 Double coil center pressure type

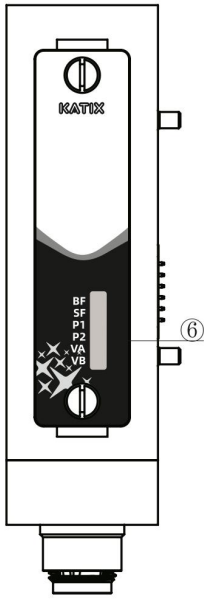
## KT3PN/EC Dimensions

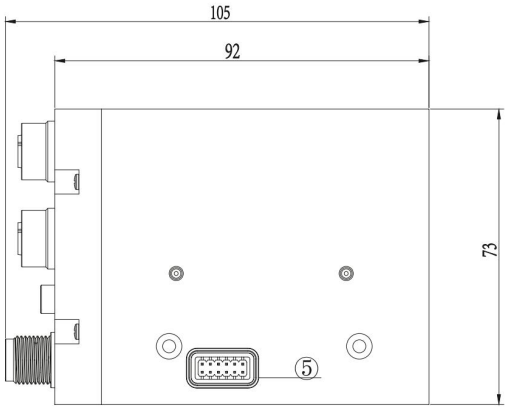


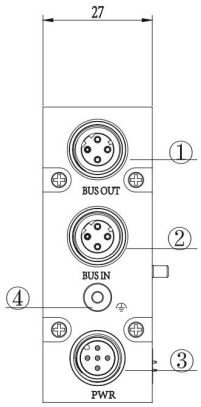

## KT5PN/EC Dimensions



### Appearance and Interface



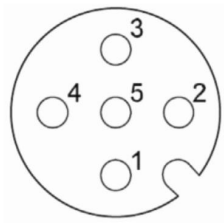




| No. | Definition | Description |
|---|---|---|
| 1 | P1 | Interface 1 PORT OUT, M12 Female, 4-pin, D-coded |
| 2 | P2 | Interface 2 PORT IN, M12 Female, 4-pin, D-coded |
| 3 | Current | Input Power, M12 Male, 5-pin, A-coded |
| 4 | Ground Connection | Ground Terminal |
| 5 | Output | 12PIN |
| 6 | Indicator Light | Status Display |

### P1\P2: M12 4PIN socket, D-coded


| No. | Definition | Description |
|---|---|---|
| 1 | TD+ | Transmit Data + |
| 2 | RD+ | Receive Data + |
| 3 | TD- | Transmit Data - |
| 4 | RD- | Receive Data - |

### PWR: M12 5PIN plug, A-coded




| No. | Definition | Description |
|---|---|---|
| 1 | V1 24V | +24V for solenoid valve |
| 2 | V1 0V | 0V for solenoid valve |
| 3 | V2 24V | +24V for V2 unit operation |
| 4 | V2 0V | 0V for V2 unit operation |
| 5 | FE | Function Ground Connection |

## Indicator Light

| No. | Definition | Indicator | Description |
|---|---|---|---|
| 1 | BF | Light Off | PROFINET software is not initialized |
| | | Red Light Normally On | Equipment Offline |
| | | Red Light Single Flash | Hardware Configuration and Parameterization are not reasonable |
| | | Red Light Flash Three Times | IOPS = BAD (PLC Stop) |
| | | Green Light Normally On | Communication is Normal |
| 2 | SF | Light Off | The device was not initialized |
| | | Red Light Normally On | Hardware Failure |
| | | Red Light Flash Slowly | Open circuit Fault |
| | | Red Light Flash Swiftly | Short Circuit Fault |
| | | Red Light Double Flash | Error , Internal Communication |
| | | Red Light Flash Three Times | A Fatal Error |
| | | Green Light Normally On | Module is Normal |
| 3 | P1 | Light Off | Link Lost Connection |
| | | Yellow Light On Green Light Flashes | Link Communication Activation |
| | | Yellow Light On / Green Light ON | Link Communication Establishment |
| 4 | P2 | Light Off | Link Lost Connection |
| | | Yellow Light On / Green Light Flashes | Link Communication Activation |
| | | Yellow Light On / Green Light ON | Link Communication Establishment |
| 5 | VA | Green Light Normally On | Manifold Power Supply , Normal |
| | | Red Light Flashes | Manifold Power Supply , Under voltage |
| | | Red Light Normally On | Manifold Power Supply, Over voltage |
| 6 | VB | Green Light Normally On | System Power Supply , Normal |
| | | Red Light Flashes | System Power Supply , Under voltage |
| | | Red Light Normally On | System Power Supply, Over voltage |

## Input and Output Data List

### 4.1 Input list

| | bit7 | bit6 | bit5 | bit4 | bit3 | bit2 | bit1 | bit0 |
|---|---|---|---|---|---|---|---|---|
| **BYTE0** | | OC | SC | COR | UV_V2 | OV_V2 | UV_V1 | OV_V1 |
| **BYTE1** | SC_7 | SC_6 | SC_5 | SC_4 | SC_3 | SC_2 | SC_1 | SC_0 |
| **BYTE2** | SC_15 | SC_14 | SC_13 | SC_12 | SC_11 | SC_10 | SC_9 | SC_8 |
| **BYTE3** | SC_23 | SC_22 | SC_21 | SC_20 | SC_19 | SC_18 | SC_17 | SC_16 |
| **BYTE4** | OC_7 | OC_6 | OC_5 | OC_4 | OC_3 | OC_2 | OC_1 | OC_0 |
| **BYTE5** | OC_15 | OC_14 | OC_13 | OC_12 | OC_11 | OC_10 | OC_9 | OC_8 |
| **BYTE6** | OC_23 | OC_22 | OC_21 | OC_20 | OC_19 | OC_18 | OC_17 | OC_16 |
| **BYTE7** | COUNT_7 | COUNT_6 | COUNT_5 | COUNT_4 | COUNT_3 | COUNT_2 | COUNT_1 | COUNT_0 |
| **BYTE8** | COUNT_15 | COUNT_14 | COUNT_13 | COUNT_12 | COUNT_11 | COUNT_10 | COUNT_9 | COUNT_8 |
| **BYTE9** | COUNT_23 | COUNT_22 | COUNT_21 | COUNT_20 | COUNT_19 | COUNT_18 | COUNT_17 | COUNT_16 |

BYTE0:

| Indicator | Description | |
|---|---|---|
| bit7 | Reserve | |
| bit6 | 1 Open Circuit Detected 0 No Open Circuit Detected | |
| bit5 | 1 Short Circuit Detected 0 No Short Circuit Detected | |
| bit5 | 1 The switch count has reached the upper threshold 0 The switch count donot reach the upper threshold | |
| bit3:bit2 | 0:0 | Electronics power supply Normal |
| | 0:1 | Electronics power supply Over Voltage |
| | 1:0 | Electronics power supply Under Voltage |
| bit1:bit0 | 0:0 | Valves power supply Normal |
| | 0:1 | Valves power supply Over Voltage |
| | 1:0 | Valves power supply Under Voltage |

**BYTE1: BYTE3**
Sc-0 corresponds to the short circuit of channel 0, SC-23 corresponds to the short circuit of channel 23, and so on to know the short circuit of each channel.
Bit value: 1 Short circuit, 0 indicates no short circuit.

**BYTE4: BYTE6**
0C-0 corresponds to the open status of channel 0, OC-23 corresponds to the open status of channel 23, and so on to know the open status of each channel.
The Bit value is 1 Open circuit, and 0 indicates no open circuit.

**BYTE7: BYTE9**
Count-0 indicates the open status of channel 0, count-23 indicates the open status of channel 23, and so on to know the open status of each channel.
The Bit value is 1 Open circuit, and 0 indicates no open circuit.

## 4.2 Output List

| | bit7 | bit6 | bit5 | bit4 | bit3 | bit2 | bit1 | bit0 |
|---|---|---|---|---|---|---|---|---|
| **BYTE0** | SC_7 | SC_6 | SC_5 | SC_4 | SC_3 | SC_2 | SC_1 | SC_0 |
| **BYTE1** | SC_15 | SC_14 | SC_13 | SC_12 | SC_11 | SC_10 | SC_9 | SC_8 |
| **BYTE2** | SC_23 | SC_22 | SC_21 | SC_20 | SC_19 | SC_18 | SC_17 | SC_16 |

O_0~O_23: O_0 indicates Channel 0, O_23 indicates Channel 23, and so on to know the location of other channels.

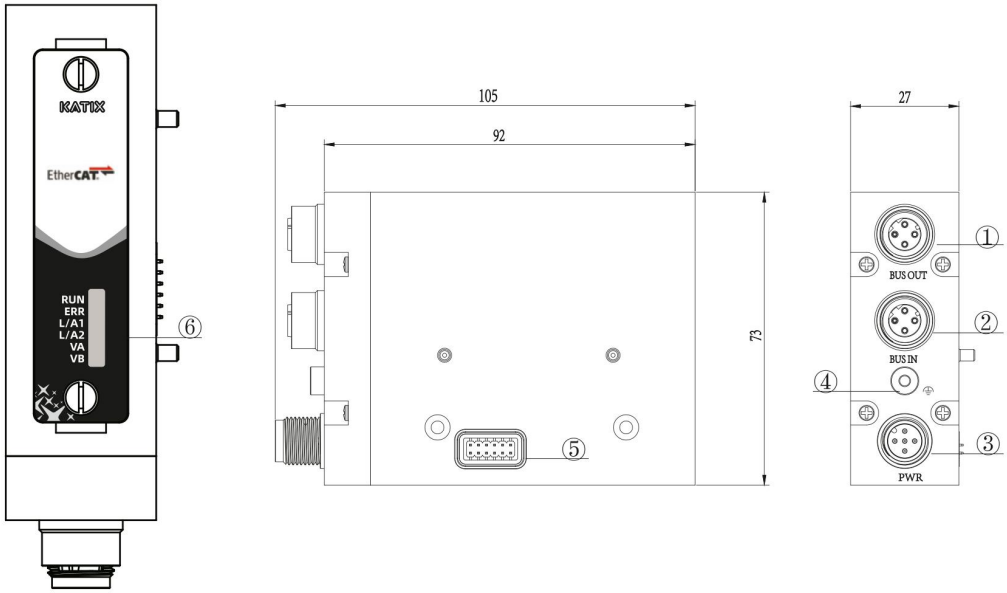
## 4.3 Error Code

| Error Code (Hexadecimal) | Error Description | LED State |
|---|---|---|
| 0x00 | 0x00, Normal | "SF" LED, Green Light Normally On |
| 0x01 | Manifold , Coil Short circuit | "SF" LED, Red Light Flashes |
| 0x06 | Manifold, Coil Open Circuit | "SF" LED, Red Light Flashes |
| 0x07 | N/A | |
| 0x100 | The power supply to the module is under voltage | "V2" LED, Red Light Flashes |
| 0x101 | The power supply to the module is over voltage | "V2" LED, Red Light Normally On |
| 0x102 | The power supply to the manifold is under voltage | "V1" LED, Red Light Flashes |
| 0x103 | The power supply to the manifold is over voltage | "V1" LED, Red Light Normally On |

## SPECIFICATION

| | |
|---|---|
| Project Specification | Ethercat |
| Control Power Supply | 24VDC +-10% |
| Output Power Supply | 24VDC +-10% |
| Internal Friction Current | Less than 100 mA |
| Output Points | 24 Points |
| Output Load | Single Valve 24V 1W Output, 24 Valves Maximum Output Current 1.5A; |
| Output Polarity | PNP,-COM |
| Version | Test Record V.1.2.8 |
| EtherCAT mode | Direct Mode |
| Address Set | Automatic Setting |
| DC Mode | Support，Distributed clocks |
| Voltage Detection | Support Voltage Detection |
| Reverse Connection Protection and Over-voltage Protection | Support |
| Diagnose | Open Circuit , Short Circuit, Switch Counting Diagnostic Function |
| Communication Rate | 100M bps |
| Communication Port | Use M12( Meet EthernetCAT Specification) |
| Communication Connection Type | Daisy Chain |
| Set File | XML File |
| Authentication | EN 61000-6-4:2007+A1:2011，EN IEC 61000-6-2:2019 |
| EMI | CLASS A |
| Power Interruptions | More than 10ms |
| Withstand Voltage | GB/T24344, 500 VAC for one minute |
| Insulation Resistance | GBT24343, 500VDCVoltage, Insulation at least 10 MΩ |
| Vibration Measurement | 5G, 10~150Hz, Continuous Vibration test for 2 hours |
| Working Temperature | -10~50℃ |
| Working Humidity | 35-85%RH |

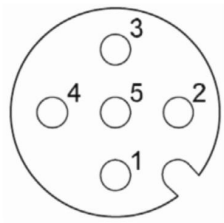
## Appearance and Interface




| No. | Definition | Description |
|---|---|---|
| 1 | P1 | Interface 1 PORT OUT, M12 Female, 4-pin, D-coded |
| 2 | P2 | Interface 2 PORT IN, M12 Female, 4-pin, D-coded |
| 3 | Current | Input Power, M12 Male, 5-pin, A-coded |
| 4 | Ground Connection | Ground Terminal |
| 5 | Output | 12PIN |
| 6 | Indicator Light | Status Display |


### P1\P2: M12 4PIN socket, D-coded

| No. | Definition | Description |
|---|---|---|
| 1 | TD+ | Transmit Data + |
| 2 | RD+ | Receive Data + |
| 3 | TD- | Transmit Data - |
| 4 | RD- | Receive Data - |




### PWR: M12 5PIN plug, A-coded

| No. | Definition | Description |
|---|---|---|
| 1 | V1 24V | +24V for solenoid valve |
| 2 | V1 0V | 0V for solenoid valve |
| 3 | V2 24V | +24V for V2 unit operation |
| 4 | V2 0V | 0V for V2 unit operation |
| 5 | FE | Function Ground Connection |

## Indicator Light

| No. | Definition | Indicator | Description |
|---|---|---|---|
| 1 | RUN | Green Light Out | The device is in INIT state |
| | | Green Light Flashes | The device is in SAFEOP state |
| | | Green Light Single Flash | The device is in PREOP state |
| | | Green Light Normally On | The device is in OP state |
| 2 | ERR | Red Light Out | Configuration Error |
| | | Red Light Flashes | No Error |
| | | Red Light Single Flash | Local Equipment Error |
| | | Red Light Double Flash | The watchdog is out of time |
| 3 | L/A1 | Light Out | Connection not established |
| | | Green Light On | Connection Established , No Communication |
| | | Green Light Flashes | Connection Established , Has Communication |
| 4 | L/A2 | Light Out | Connection Established , No Communication |
| | | Green Light On | Connection not established |
| | | Green Light Flashes | Connection Established , Has Communication |
| 5 | VA | Green Light On | Manifold Power Supply , Normal |
| | | Red Light Flashes | Manifold Power Supply , Under voltage |
| | | Red Light On | Manifold Power Supply, Over voltage |
| 6 | VB | Green Light On | System Power Supply , Normal |
| | | Red Light Flashes | System Power Supply , Under voltage |
| | | Red Light On | System Power Supply, Over voltage |

## Input and Output Data List

### 4.1 Input list

| | bit7 | bit6 | bit5 | bit4 | bit3 | bit2 | bit1 | bit0 |
|---|---|---|---|---|---|---|---|---|
| **BYTE0** | | OC | SC | COR | UV_V2 | OV_V2 | UV_V1 | OV_V1 |
| **BYTE1** | SC_7 | SC_6 | SC_5 | SC_4 | SC_3 | SC_2 | SC_1 | SC_0 |
| **BYTE2** | SC_15 | SC_14 | SC_13 | SC_12 | SC_11 | SC_10 | SC_9 | SC_8 |
| **BYTE3** | SC_23 | SC_22 | SC_21 | SC_20 | SC_19 | SC_18 | SC_17 | SC_16 |
| **BYTE4** | OC_7 | OC_6 | OC_5 | OC_4 | OC_3 | OC_2 | OC_1 | OC_0 |
| **BYTE5** | OC_15 | OC_14 | OC_13 | OC_12 | OC_11 | OC_10 | OC_9 | OC_8 |
| **BYTE6** | OC_23 | OC_22 | OC_21 | OC_20 | OC_19 | OC_18 | OC_17 | OC_16 |
| **BYTE7** | COUNT_7 | COUNT_6 | COUNT_5 | COUNT_4 | COUNT_3 | COUNT_2 | COUNT_1 | COUNT_0 |
| **BYTE8** | COUNT_15 | COUNT_14 | COUNT_13 | COUNT_12 | COUNT_11 | COUNT_10 | COUNT_9 | COUNT_8 |
| **BYTE9** | COUNT_23 | COUNT_22 | COUNT_21 | COUNT_20 | COUNT_19 | COUNT_18 | COUNT_17 | COUNT_16 |

BYTE0:

| Indicator | Description | |
|---|---|---|
| bit7 | Reserve | |
| bit6 | 1 Open Circuit Detected 0 No Open Circuit Detected | |
| bit5 | 1 Short Circuit Detected 0 No Short Circuit Detected | |
| bit4 | 1 The switch count has reached the upper threshold 0 The switch count donot reach the upper threshold | |
| bit3:bit2 | 0:0 | Electronics power supply Normal |
| | 0:1 | Electronics power supply Over Voltage |
| | 1:0 | Electronics power supply Under Voltage |
| bit1:bit0 | 0:0 | Valves power supply Normal |
| | 0:1 | Valves power supply Over Voltage |
| | 1:0 | Valves power supply Under Voltage |

**BYTE1: BYTE3**
Sc-0 corresponds to the short circuit of channel 0, SC-23 corresponds to the short circuit of channel 23, and so on to know the short circuit of each channel.
Bit value: 1 Short circuit, 0 indicates no short circuit.

**BYTE4: BYTE6**
0C-0 corresponds to the open status of channel 0, OC-23 corresponds to the open status of channel 23, and so on to know the open status of each channel.
The Bit value is 1 Open circuit, and 0 indicates no open circuit.

**BYTE7: BYTE9**
Count-0 indicates the open status of channel 0, count-23 indicates the open status of channel 23, and so on to know the open status of each channel.
The Bit value is 1 Open circuit, and 0 indicates no open circuit.

## 4.2 Output List

| | bit7 | bit6 | bit5 | bit4 | bit3 | bit2 | bit1 | bit0 |
|---|---|---|---|---|---|---|---|---|
| **BYTE0** | SC_7 | SC_6 | SC_5 | SC_4 | SC_3 | SC_2 | SC_1 | SC_0 |
| **BYTE1** | SC_15 | SC_14 | SC_13 | SC_12 | SC_11 | SC_10 | SC_9 | SC_8 |
| **BYTE2** | SC_23 | SC_22 | SC_21 | SC_20 | SC_19 | SC_18 | SC_17 | SC_16 |

O_0~O_23: O_0 indicates Channel 0, O_23 indicates Channel 23, and so on to know the location of other channels.

# Manifold Adapters

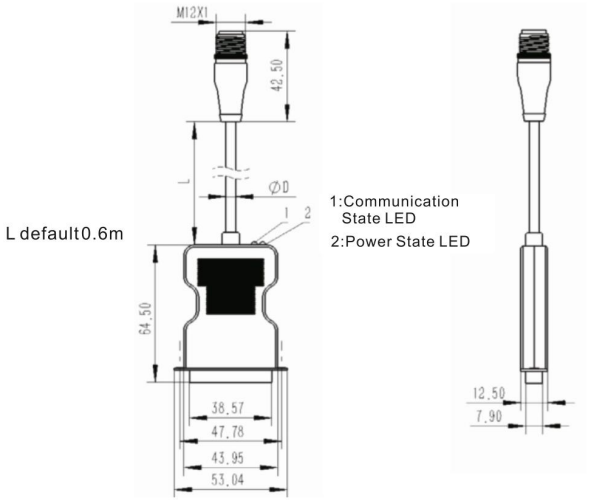
## FEATURES

The Valve Manifold Adapter KTA-H24-COM13 is an IO-Link device for installed on DB25-connected valve manifold. It is a signal conversion module that converts the DB25 connection into an IO-Link connection. It adopts a 3-wire connection with an IO-Link Type- A port, and supports the drive of 24 solenoid valves, with a total drive current of no more than 1.6A, and a maximum of 500mA for a single circuit. The adapter is powered from the IO-Link master. Applicable to valve terminals with 13-pin DB25 connector as the common end.

## SPECIFICATION

| | |
|---|---|
| **Model No.** | KTA-H24-COM13 |
| **IO-Link version** | V1.1.3 |
| **Rate** | COM2(38.4k) |
| **Min. cycle time** | 3.5ms |
| **Process data** | 4 bytes |
| **Display/Running** | Green LED |
| **Configurable Inputs & Outputs** | NO |
| **Working Voltage** | 18~30VDC |
| **Total current (actuator)** | 1.6A |
| **Quiescent current** | 30mA |
| **Typical Working Voltage** | 24VDC |
| **Actuator connection port** | DB25 |
| **Sensor connection port** | M12x1 |
| **Wire** | 0.6m*0.34mm2 |
| **Shell material** | PA |
| **Sheath material** | PUR |
| **Protection class** | IP40 |
| **Operating temperature** | 10~55℃ |
| **Storage temperature** | 25~70℃ |
| **Mechanical dimensions** | 62mm*52mm*12mm |

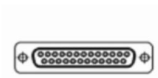
### Dimension Graphy



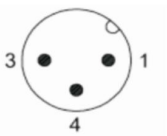

L default0.6m

1:Communication State LED
2:Power State LED

### Connection method



PIN1~12,14~25:output
PIN13:0V




IO-Link Connector
PIN1:+24V,Controller+valve
PIN3:0V
PIN4:IO-Link

Contact us for more details

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KATIX

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