Specifications

KEYENCE

Visual KV Series

Input specifications of basic unit

Model	KV-16□□	KV-24□□	KV-40□□
No. of inputs	10	16	24
Input common	COM is connected internally.		
Maximum input rating	26.4 VDC		
Input voltage *1	24 VDC, 5.3 mA/5 VDC, 1.0 mA		
Input time constant	10 ms (Typical) 10 µs when HSP instruction is used Variable in 7 steps from 10 µs to 10 ms while special utility relay 2813 is ON (Set by DM1940)		
Interrupt input response	10 µs (Typical)		
High-speed counter input response	30 kHz (24V±10%)		

*1. Inputs 000 to 007 can be changed to 5 V input.

Output specifications of basic unit

Model	KV-16□T	KV-24□T	KV-40□T	KV-16□R	KV-24□R	KV-40□R
No. of outputs	6	8	16	6	8	16
Output common	1 common			Each common terminal is independent.		
Output type	Transistor output (NPN)			Relay output		
Rated load	30 VDC 0.3 A (503 and other) 0.1 A (500 to 502)			250 VAC/30 VDC 2 A (Inductive load) 4 A (Resistive load)		
Peak load current	0.2 A (500 to 502) 1 A (Other)			5 A		
Relay service life	—			Electrical service life: 100,000 times or more (20 times/min) Mechanical service life: 20-million times or more		
Relay replacement	—			Not allowed		
Output frequency	50 kHz (500 to 502)			—		
Built-in serial resistance	1.6 kΩ 1/2W (R500 to R502)			—		

Input/output specifications of expansion unit

Input/output	Input		Output				Input/output
External connection method	Terminal block						
Model	KV-E8X	KV-E16X	KV-E8T	KV-E16T	KV-E8R	KV-E16R	KV-E4XT/R
Number of inputs	8	16	—				4
Input common	4 points/common		—				4 points/common
Maximum input rating	26.4 VDC		—				26.4 VDC
Input voltage	24 VDC, 5.3 mA		—				24 VDC, 5.3 mA
Minimum ON voltage	19 V		—				19 V
Maximum OFF current	2 mA		—				2 mA
Input impedance	4.3 kΩ		—				4.3 kΩ
Input time constant (Changed in two steps by special utility relays 2609 to 2612)	For both rising (OFF → ON) and falling (ON → OFF) operations, 10 ms: 10 ms±20%, 10 µs: 10 µs±20%		—				For both rising (OFF → ON) and falling (ON → OFF) operations, 10 ms: 10 ms±20%, 10 µs: 10 µs±20%
Number of outputs	—		8	16	8	16	4
Output type	—		NPN Transistor		Relay		NPN Transistor/Relay
Output common	—		COM is connected internally.		4 points/common		4 points/common
Rated load voltage	—		30 VDC		250 VAC/30 VDC, 2 A (Inductive load), 4 A (Resistive load)		30 VDC/, 250 VAC/30 VDC, 2 A (Inductive load), 4 A (Resistive load)
Rated output current	—		0.5 A/point		2 A/point (Inductive load), 4 A/point (Resistive load), 4 A/common		0.5 A/point/, 2 A/point (Inductive load), 4 A (Resistive load), 4 A/common
ON resistance	—		—		50 mΩ or less		— / 50 mΩ or less
Leakage current at OFF	—		100 µA max.		—		100 µa max./ —
Residual voltage at ON	—		0.8 V max.		—		0.8 V max./ —
Rising operation time (OFF → ON)	—		50 µs max.		10 ms max.		50 µs max./10 ms max.
Falling operation time (ON → OFF)	—		250 µs max.		10 ms max.		250 µs max./10 ms max.
Relay service life	—		—		Electrical: 100,000 times or more (20 times/min), Mechanical: 20-million times or more		— / Electrical: 100,000 times or more (20 times/min), Mechanical: 20-million times or more
Relay replacement	—		—		Not allowed		— /Not allowed
Weight	Approx. 100 g	Approx. 130 g	Approx. 100 g	Approx. 130 g	Approx. 130 g	Approx. 190 g	Approx. 100 g/Approx. 120 g

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General specifications

Power supply	Basic unit	AC type KV-16AT/AR KV-24AT/AR KV-40AT/AR	DC type KV-16DT/DR KV-24DT/DR KV-40DT/DR
AC power input voltage	Basic unit	100 to 240 VAC (±10%)	24 VDC (±10%)
AC power current consumption	Basic unit	KV-16AT/AR: 0.5 A KV-24AT/AR: 0.6 A KV-40AT/AR: 0.7 A	—
AC power factor	Basic unit	60%	—
Output voltage	Basic unit	24 VDC (±10%)	—
Output capacity (Including the internal current consumption and current consumption of expansion units.)	Basic unit	KV-16AT/AR: 0.6 A KV-24AT/AR: 0.6 A KV-40AT/AR: 0.7 A	—
Allowable instantaneous interruption time	Basic unit	40 ms max.	2 ms max.
Internal current consumption (converted into 24 VDC value)	Basic unit	KV-16AR/DR: 120 mA max. KV-16AT/DT: 90(100) mA max. KV-24AR/DR: 140 mA max. KV-24AT/DT: 100(105) mA max. KV-40AR/DR: 180 mA max. KV-40AT/DT: 120(130) mA max.	
	Expansion units	KV-E8X: 25 mA max. KV-E16X: 35 mA max. KV-E8T: 40 mA max. KV-E16T: 60(70) mA max. KV-E8R: 70 mA max. KV-E16R: 110 mA max. KV-E4XR: 45 mA max. KV-E4XT: 30 mA max.	
	Others	KV-D20 Operator panel: 60 mA max. KV-P3E Handheld programmer: 65 mA max.	
Ambient temperature		0 to +50°C, 0 to +45°C (KV-P3E)	
Relative humidity		35 to 85%	
Ambient storage temperature		-20 to +70°C	
Withstand voltage		1,500 VAC for 1 minute0 (Between power terminal and I/O terminals, and between external terminals and housing)	
Noise immunity		1,500 Vp-p min., pulse width: 1 µs, 50 ns (by noise simulator) Conforming to EN standard (EN55011-2/-3/-4/-6)	
Shock		150 m/s² (15 G), working time: 11 ms, in X, Y and Z directions, 2 times respectively	
Vibration		10 to 55 Hz, 1.5 mm max. double amplitude in X, Y and Z directions, 2 hours respectively (1 G max. when attached to DIN rail)	
Insulation resistance		50 MΩ min. (Between power terminal and I/O terminals, and between external terminals and housing, measured with 500 VDC megohmmeter)	
Environmental restrictions		No excessive dust or corrosive gases	
Weight		KV-16AR: Approx. 300 g, KV-16AT: Approx. 290 g KV-24AR: Approx. 350 g, KV-24AT: Approx. 330 g KV-40AR: Approx. 450 g, KV-40AT: Approx. 420 g KV-16DR: Approx. 190 g, KV-16DT: Approx. 180 g KV-24DR: Approx. 240 g, KV-24DT: Approx. 220 g KV-40DR: Approx. 330 g, KV-40DT: Approx. 290 g	

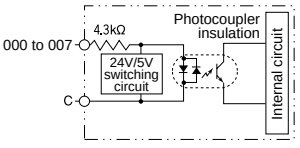
Performance specifications

Arithmetic operation control method		Stored program method
I/O control method		Refresh method
Programming language		Ladder diagram and expanded ladder diagram
Instruction types		Basic instruction: 28, Application instruction: 22, Arithmetic instruction: 26, Interrupt instruction: 4
Minimum scan time		140 µs min.
Instruction processing time		Basic instruction: 0.7 µs min., Application instruction: 6.4 µs. min.
Program capacity		2,000 steps (KV-16□□) 4,000 steps (KV-24□□, KV-40□□)
Maximum number of expansion units		8 (7 for KV-40□□)
Number of I/O points (including 16 to 40 I/O points of basic unit)		16 to 152 points (when expansion units are connected)
Internal utility relay		2,560 points: 1000 to 1915 and 3000 to 17915
Special utility relay		160 points: 2000 to 2915
Data memory (16 bits)		2,000 words: DM 0000 to DM1999
Temporary data memory (16 bits)		32 words: TM00 to TM31
Timer/counter		0.1-s timer: TMR (0 to 6553.5 s), 0.01-s timer: TMH (0 to 655.35 s), 0.001-s timer: TMS (0 to 65.535 s), UP counter: C, Up/down counter: UDC
Digital trimmer		2 trimmers (set in access window)
High-speed counter		2 counters of 30 kHz, 2-phase high-speed counter (0 to 65535 count) *1
High-speed counter comparator		4 comparators (2 for each high-speed counter) Direct output allowed
Positioning control function		Independent 1 axis, 50 kHz max.
Memory switch		16
Memory backup	**Program memory**	Flash ROM, rewritable 100,000 times or more
	Data memory, counter, internal utility relay (Retention devices are set by MEMSW instruction.)	Data retained for 2 months min. with electrical double-layer capacitor (at 25°C), Data can be backed up with EEP ROM in all models.
Self-diagnosis		CPU and RAM errors
Number of contact comments		1,000 max. contact comments can be saved.

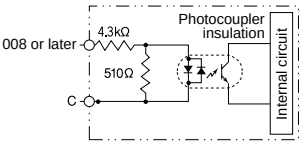
*1. 24-bit setting is available.

Input/output circuit of base unit

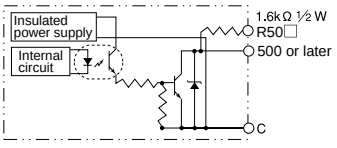
Input 000 to 007



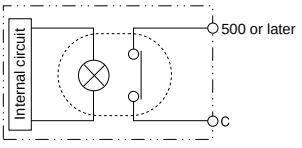
Input 008 or later



KV-□□ DT/AT

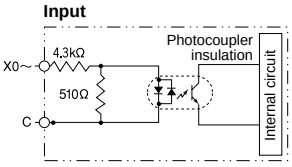


KV-□□ DR/AR

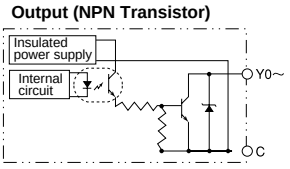


Input/output circuit of expansion unit

Input



Output (NPN Transistor)



Output (Relay)