

### Data sheet

CPU 313SC DPM (313-6CF23)

### Technical data

Order no.	313-6CF23
Туре	CPU 313SC DPM
General information	
Note	
Features	Powered by SPEED7 Work memory [KB]: 2561.024 Onboard: 16x DI / 16x DO / 3x Counter / 3x PWM Interface [RJ45]: Ethernet PG/OP communication Interface [2x RS485]: MPI, PROFIBUS master/slave, PtP: ASCII, STX/ETX, 3964 (R), USS master, Modbus master/slave Including front connector SD/MMC card slot with locking, up to 32 modules stackable, programmable with WinPLC7, SIMATIC Manager and TIA Portal
SPEED-Bus	-
Technical data power supply	
Power supply (rated value)	DC 24 V
Power supply (permitted range)	DC 20.428.8 V
Reverse polarity protection	yes
Current consumption (no-load operation)	200 mA
Current consumption (rated value)	900 mA
Inrush current	11 A
2 <sub>t</sub>	0.7 A²s
Max. current drain at backplane bus	3 A
Max. current drain load supply	-
Power loss	14 W
Technical data digital inputs	
Number of inputs	16
Cable length, shielded	1000 m
Cable length, unshielded	600 m
Rated load voltage	DC 24 V
Reverse polarity protection of rated load voltage	yes
Current consumption from load voltage L+ (without load)	70 mA
Rated value	DC 24 V
Input voltage for signal "0"	DC 05 V
Input voltage for signal "1"	DC 1528.8 V
Input voltage hysteresis	-
Signal logic input	Sinking input
Frequency range	-
Input resistance	-
Input current for signal "1"	6 mA
Connection of Two-Wire-BEROs possible	yes
Max. permissible BERO quiescent current	1.5 mA
Input delay of "0" to "1"	0.1 / 0.35 ms
Input delay of "1" to "0"	0.1 / 0.35 ms



Number of simultaneously utilizable inputs horizontal configuration	16
Number of simultaneously utilizable inputs vertical configuration	16
Input characteristic curve	IEC 61131-2, type 1
Initial data size	2 Byte
Technical data digital outputs	
Number of outputs	16
Cable length, shielded	1000 m
Cable length, unshielded	600 m
Rated load voltage	DC 24 V
Reverse polarity protection of rated load voltage	-
Current consumption from load voltage L+ (without load)	100 mA
Total current per group, horizontal configuration, 40°C	3 A
Total current per group, horizontal configuration, 60°C	2 A
Total current per group, vertical configuration	2 A
Output voltage signal "1" at min. current	L+ (-0.8 V)
Output voltage signal "1" at max. current	L+ (-0.8 V)
Output current at signal "1", rated value	0.5 A
Signal logic output	Sourcing output
Output current, permitted range to 40°C	5 mA to 0.6 A
Output current, permitted range to 60°C	5 mA to 0.6 A
Output current at signal "0" max. (residual current)	0.5 mA
Output delay of "0" to "1"	100 µs
Output delay of "1" to "0"	100 µs
Minimum load current	-
Lamp load	5 W
Parallel switching of outputs for redundant control of a load	possible
Parallel switching of outputs for increased power	not possible
Actuation of digital input	yes
Switching frequency with resistive load	max. 2.5 kHz
Switching frequency with inductive load	max. 0.5 Hz
Switching frequency on lamp load	max. 2.5 kHz
Internal limitation of inductive shut-off voltage	L+ (-52 V)
Short-circuit protection of output	yes, electronic
Trigger level	1 A
Number of operating cycle of relay outputs	-
Switching capacity of contacts	-
Output data size	2 Byte
Technical data analog inputs	
Number of inputs	-
Cable length, shielded	-
Rated load voltage	-
Reverse polarity protection of rated load voltage	-
Current consumption from load voltage L+ (without load)	-
Voltage inputs	-
Min. input resistance (voltage range)	-
Input voltage ranges	-
Operational limit of voltage ranges	-

Basic error limit voltage ranges with SFU - Destruction limit voltage ranges with SFU - Current inputs - Max. Input resistance (current range) - Input current ranges - Operational limit of current ranges - Operational limit of current ranges with SFU - Basic error limit current ranges with SFU - Destruction limit or selstor ranges - Operational limit of resistor ranges - Operational limit of resistor ranges with SFU - Basic error limit with SFU - Destruction limit resistance inputs - Resistance thermometer ranges - Operational limit of resistor ranges - Operational limit of resistance thermometer ranges - Destruction limit thermoresistor ranges with SFU - Basic error limit thermoresistor ranges with SFU - Destruction limit resistance thermometer ranges - Operational limit of thermocouple ranges with SFU - Bestic error limit thermocouple ranges with SFU - Destruction limit thermocouple ranges with SFU - Dest		
Basic error limit voltage ranges with SFU  Current inputs  Max. input resistance (current range)  Input current ranges  Operational limit of current ranges  Operational limit of current ranges with SFU  Basic error limit current ranges with SFU  Destruction limit current ranges with SFU  Destruction limit current inputs (voltage)  Resistance inputs  Resistance ranges  Operational limit of resistor ranges with SFU  Destruction limit current ranges with SFU  Destruction limit current inputs (voltage)  Resistance inputs  Resistance ranges  Operational limit of resistor ranges  Operational limit of resistor ranges with SFU  Basic error limit with SFU  Destruction limit of resistor ranges with SFU  Operational limit of resistor ranges  Operational limit of resistance inputs  Resistance thermometer inputs  Resistance thermometer ranges  Operational limit of resistance whermometer ranges  Operational limit of remocouple ranges  Basic error limit themorosistor ganges with SFU  Destruction limit resistance whermometer inputs  Thermocouple inputs  Programmable temperature compensation  Furthermocouple ranges  Operational limit of thermocouple ranges  Operational limit of thermocouple ranges  Operational limit of thermocouple ranges with SFU  Destruction limit termoresistor ganges	Operational limit of voltage ranges with SFU	-
Destruction limit voltage		-
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Max. input resistance (current ranges   -	Destruction limit voltage	-
Input current ranges - Operational limit of current ranges - Operational limit of current ranges with SFU - Basic error limit current ranges with SFU - Destruction limit current ranges with SFU - Destruction limit current inputs (voltage) - Resistance inputs - Resistance inputs - Resistance inputs - Resistance inputs - Resistance limit of resistor ranges - Operational limit of resistor ranges - Operational limit of resistor ranges with SFU - Basic error limit with SFU - Destruction limit current inputs (voltage) - Resistance thermometer inputs - Resistance thermometer inputs - Resistance thermometer ranges - Operational limit of resistor ranges with SFU - Basic error limit with SFU - Destruction limit resistance thermometer ranges - Operational limit of resistance thermometer ranges - Operational limit of resistance thermometer ranges - Operational limit of resistance thermometer ranges with SFU - Basic error limit thermoresistor ranges with SFU - Destruction limit resistance thermometer inputs - Thermocouple inputs - Thermocouple inputs - Thermocouple inputs - Thermocouple ranges with SFU - Destruction limit of thermocouple ranges with SFU - Destruction limit of thermocouple ranges with SFU - Destruction limit thermocouple ranges with SFU - Destruction limit thermocouple ranges with SFU - Destruction limit of thermocouple ranges with SFU - Destruction limit thermocouple ranges with SFU	Current inputs	-
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Operational limit of resistor ranges - Operational limit of resistor ranges with SFU - Basic error limit error limit with SFU	Resistance inputs	-
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Basic error limit with SFU - Destruction limit resistance inputs - Resistance thermometer inputs - Resistance thermometer ranges - Operational limit of resistance thermometer ranges - Operational limit of resistance thermometer ranges with SFU - Destruction limit thermoresistor ranges with SFU - Destruction limit resistance thermometer inputs - Thermocouple inputs - Thermocouple ranges - Operational limit of thermocouple ranges with SFU - Destruction limit of thermocouple ranges with SFU - Destruction limit of thermocouple ranges - Operational limit of thermocouple ranges with SFU - Basic error limit thermocouple ranges with SFU - Destruction limi	Operational limit of resistor ranges	-
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Operational limit of resistance thermometer ranges - Operational limit of resistance thermometer ranges with SFU - Basic error limit thermoresistor ranges - Basic error limit thermoresistor ranges with SFU - Destruction limit resistance thermometer inputs - Thermocouple inputs - Thermocouple inputs - Thermocouple ranges - Operational limit of thermocouple ranges - Operational limit of thermocouple ranges - Operational limit of thermocouple ranges with SFU - Basic error limit thermocouple ranges with SFU - Basic error limit thermocouple ranges with SFU - Destruction limit thermocouple inputs - Programmable temperature compensation - External temperature compensation - Internal temperature compensation - Technical unit of temperature measurement - Resolution in bit - Measurement principle - Basic conversion time - Noise suppression for frequency - Initial data size - Technical data analog outputs Number of outputs - Cable length, shielded - Rated load voltage -	Resistance thermometer inputs	-
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Basic error limit thermoresistor ranges with SFU  Destruction limit resistance thermometer inputs  Thermocouple inputs  Thermocouple ranges  Operational limit of thermocouple ranges  Basic error limit thermocouple ranges with SFU  Destruction limit thermocouple ranges with SFU  Destruction limit thermocouple inputs  Frogrammable temperature compensation  External temperature compensation  External temperature compensation  Technical unit of temperature measurement  Resolution in bit  Measurement principle  Basic conversion time  Noise suppression for frequency  Initial data size  Technical data analog outputs  Number of outputs  Cable length, shielded  Rated load voltage  -	Operational limit of resistance thermometer ranges with SFU	-
Destruction limit resistance thermometer inputs	Basic error limit thermoresistor ranges	-
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Basic error limit thermocouple ranges	Operational limit of thermocouple ranges	-
Basic error limit thermocouple ranges with SFU  Destruction limit thermocouple inputs  Programmable temperature compensation  External temperature compensation  Internal temperature compensation  Technical unit of temperature measurement  Resolution in bit  Measurement principle  Basic conversion time  Noise suppression for frequency  Initial data size  Technical data analog outputs  Number of outputs  Cable length, shielded  Retain an analog outputs  Retain an analog outputs  Cable length, shielded  Retain an analog outputs  Retain analog outputs  Cable length, shielded	Operational limit of thermocouple ranges with SFU	
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Resolution in bit  Measurement principle  Basic conversion time  Noise suppression for frequency  Initial data size  Technical data analog outputs  Number of outputs  Cable length, shielded  Rated load voltage  -  -  -  -  -  -  -  -  -  -  -  -  -	Internal temperature compensation	-
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Initial data size -  Technical data analog outputs  Number of outputs -  Cable length, shielded -  Rated load voltage -	Basic conversion time	-
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Number of outputs - Cable length, shielded - Rated load voltage -	Initial data size	-
Number of outputs - Cable length, shielded - Rated load voltage -	Technical data analog outputs	
Cable length, shielded - Rated load voltage -		•
Rated load voltage -	·	-
		-
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	Terrorso policing protocitors of rated load voltage	

Current consumption from load voltage L+ (without load)	-
Voltage output short-circuit protection	-
Voltage outputs	-
Min. load resistance (voltage range)	-
Max. capacitive load (current range)	-
Max. inductive load (current range)	-
Output voltage ranges	-
Operational limit of voltage ranges	-
Basic error limit voltage ranges with SFU	-
Destruction limit against external applied voltage	-
Current outputs	-
Max. in load resistance (current range)	-
Max. inductive load (current range)	-
Typ. open circuit voltage current output	-
Output current ranges	-
Operational limit of current ranges	-
Radical error limit current ranges with SFU	-
Destruction limit against external applied voltage	-
Settling time for ohmic load	-
Settling time for capacitive load	-
Settling time for inductive load	-
Resolution in bit	-
Conversion time	-
Substitute value can be applied	-
Output data size	-
Technical data counters	
Number of counters	3
Counter width	32 Bit
Maximum input frequency	30 kHz
Maximum count frequency	30 kHz
Mode incremental encoder	yes
Mode pulse / direction	yes
Mode pulse	yes
Mode frequency counter	yes
Mode period measurement	yes
Gate input available	yes
Latch input available	yes
Reset input available	-
Counter output available	yes
Load and working memory	,
Load memory, integrated	1024 KB
Load memory, maximum	1024 KB
Work memory, integrated	256 KB
Work memory, maximal	1024 KB
Memory divided in 50% program / 50% data	yes SD/MMC.Card with may 2 GR
Memory card slot	SD/MMC-Card with max. 2 GB
Hardware configuration	
Racks, max.	4

Modules per rack, max.	8
Number of integrated DP master	1
Number of DP master via CP	4
Operable function modules	8
Operable communication modules PtP	8
Operable communication modules LAN	8
Status information, alarms, diagnostics	
Status display	yes
Interrupts	yes
Process alarm	yes
Diagnostic interrupt	yes
Diagnostic functions	no
Diagnostics information read-out	possible
Supply voltage display	green LED
Group error display	red SF LED
Channel error display	red LED per group
Isolation	
Between channels	yes
Between channels of groups to	16
Between channels and backplane bus	yes
Between channels and power supply	
Max. potential difference between circuits	DC 75 V/ AC 50 V
Max. potential difference between inputs (Ucm)	
Max. potential difference between Mana and Mintern (Uiso)	-
Max. potential difference between inputs and Mana (Ucm)	-
Max. potential difference between inputs and Mintern (Uiso)	-
Max. potential difference between Mintern and outputs	-
Insulation tested with	DC 500 V
Command processing times	
Bit instructions, min.	0.02 µs
Word instruction, min.	0.02 µs
Double integer arithmetic, min.	0.02 µs
Floating-point arithmetic, min.	0.12 µs
Timers/Counters and their retentive characteristi	cs
Number of S7 counters	512
S7 counter remanence	adjustable 0 up to 256
S7 counter remanence adjustable	C0 C7
Number of S7 times	512
S7 times remanence	adjustable 0 up to 256
S7 times remanence adjustable	not retentive
Data range and retentive characteristic	
Number of flags	8192 Byte
Bit memories retentive characteristic adjustable	adjustable 0 up to 256
Bit memories retentive characteristic preset	MB0 MB15
Number of data blocks	4095
Max. data blocks size	64 KB
Max. local data size per execution level	510 Byte

	IASIMA
Blocks	
Number of OBs	15
Number of FBs	2048
Number of FCs	2048
Maximum nesting depth per priority class	8
Maximum nesting depth additional within an error OB	4
Time	
Real-time clock buffered	yes
Clock buffered period (min.)	6 W
Accuracy (max. deviation per day)	10 s
Number of operating hours counter	8
Clock synchronization	yes
Synchronization via MPI	Master/Slave
Synchronization via Ethernet (NTP)	no
Address areas (I/O)	
Input I/O address area	1024 Byte
Output I/O address area	1024 Byte
Input process image maximal	128 Byte
Output process image maximal	128 Byte
Digital inputs	8064
Digital outputs	8064
Digital inputs central	1008
Digital outputs central	1008
Integrated digital inputs	16
Integrated digital outputs	16
Analog inputs	503
Analog outputs	503
Analog inputs, central	248
Analog outputs, central	248
Integrated analog inputs	0
Integrated analog outputs	0
Communication functions	
PG/OP channel	100
Global data communication	yes
	yes
Number of GD circuits, max.  Size of GD packets, max.	4 22 Puto
	22 Byte
S7 basic communication	yes 70 Puto
S7 basic communication, user data per job	76 Byte
S7 communication	yes
S7 communication as server	yes
S7 communication as client	- 400 Puto
S7 communication, user data per job	160 Byte
Number of connections, max.	32
PWM data	
PWM channels	3
PWM time basis	0.1 ms / 1 ms
Period length	465535 / 165535 * time base
Minimum pulse width	00.5 * Period duration



Type of output Highside with 1.1kOhm pulldown

Type of output	Highside with 1.1kOhm pulldown
Functionality Sub-D interfaces	
Туре	X2
Type of interface	RS485
Connector	Sub-D, 9-pin, female
Electrically isolated	-
MPI	yes
MP <sup>2</sup> I (MPI/RS232)	-
DP master	-
DP slave	-
Point-to-point interface	
5V DC Power supply	max. 90mA, non-isolated
24V DC Power supply	max. 100mA, non-isolated
— — — — — — — — — — — — — — — — — — —	
Tuno	V2
Type of interface	X3 RS485
Type of interface	
Connector	Sub-D, 9-pin, female
Electrically isolated	yes
MPI	•
MP²I (MPI/RS232)	•
DP master	yes
DP slave	yes
Point-to-point interface	yes
5V DC Power supply	max. 90mA, isolated
24V DC Power supply	max. 100mA, non-isolated
Functionality MPI	
Number of connections, max.	32
PG/OP channel	yes
Routing	yes
Global data communication	yes
S7 basic communication	yes
S7 communication	yes
S7 communication as server	yes
S7 communication as client	-
Transmission speed, min.	19.2 kbit/s
Transmission speed, max.	187.5 kbit/s
Functionality PROFIBUS master	
Number of connections, max.	32
PG/OP channel	yes
Routing	yes
S7 basic communication	yes
S7 communication	yes
S7 communication as server	yes
S7 communication as client	-
Activation/deactivation of DP slaves	yes
Direct data exchange (slave-to-slave communication)	+
DPV1	yes
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Transmission speed, min.	9.6 kbit/s

Transmission speed, max.	12 Mbit/s
Number of DP slaves, max.	32
Address range inputs, max.	1 KB
Address range outputs, max.	1 KB
User data inputs per slave, max.	244 Byte
User data outputs per slave, max.	244 Byte
	244 Dyle
Functionality PROFIBUS slave	
Number of connections, max.	32
PG/OP channel	yes
Routing	yes
S7 communication	yes
S7 communication as server	yes
S7 communication as client	-
Direct data exchange (slave-to-slave communication)	-
DPV1	yes
Transmission speed, min.	9.6 kbit/s
Transmission speed, max.	12 Mbit/s
Automatic detection of transmission speed	•
Transfer memory inputs, max.	244 Byte
Transfer memory outputs, max.	244 Byte
Address areas, max.	32
User data per address area, max.	32 Byte
Functionality RJ45 interfaces	
Туре	X5
Type of interface	Ethernet 10/100 MBit
Connector	RJ45
Electrically isolated	yes
Electrically isolated PG/OP channel	yes yes
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PG/OP channel	yes
PG/OP channel  Number of connections, max.	yes
PG/OP channel  Number of connections, max.  Productive connections	yes
PG/OP channel  Number of connections, max.  Productive connections  Point-to-point communication	yes 4 -
PG/OP channel  Number of connections, max.  Productive connections  Point-to-point communication  PtP communication	yes 4 - yes
PG/OP channel  Number of connections, max.  Productive connections  Point-to-point communication  PtP communication  Interface isolated	yes 4 - yes yes yes
PG/OP channel  Number of connections, max.  Productive connections  Point-to-point communication  PtP communication  Interface isolated  RS232 interface	yes 4 - yes yes yes -
PG/OP channel  Number of connections, max.  Productive connections  Point-to-point communication  PtP communication  Interface isolated  RS232 interface  RS422 interface	yes 4 - yes yes yes
PG/OP channel  Number of connections, max.  Productive connections  Point-to-point communication  PtP communication  Interface isolated  RS232 interface  RS422 interface  RS485 interface	yes 4 - yes yes yes yes yes yes
PG/OP channel  Number of connections, max.  Productive connections  Point-to-point communication  PtP communication  Interface isolated  RS232 interface  RS422 interface  RS485 interface  Connector	yes 4 - yes yes yes yes yes Sub-D, 9-pin, female
PG/OP channel  Number of connections, max.  Productive connections  Point-to-point communication  PtP communication  Interface isolated  RS232 interface  RS422 interface  RS485 interface  Connector  Transmission speed, min.  Transmission speed, max.	yes 4 - yes yes yes yes Sub-D, 9-pin, female 150 bit/s
PG/OP channel  Number of connections, max.  Productive connections  Point-to-point communication  PtP communication  Interface isolated  RS232 interface  RS422 interface  RS485 interface  Connector  Transmission speed, min.  Transmission speed, max.  Cable length, max.	yes 4 - yes yes yes yes yes Sub-D, 9-pin, female 150 bit/s 115.5 kbit/s
PG/OP channel  Number of connections, max.  Productive connections  Point-to-point communication  PtP communication  Interface isolated  RS232 interface  RS422 interface  RS485 interface  Connector  Transmission speed, min.  Transmission speed, max.  Cable length, max.  Point-to-point protocol	yes  4  -  yes  yes  yes  -  yes  Sub-D, 9-pin, female  150 bit/s  115.5 kbit/s  500 m
PG/OP channel  Number of connections, max.  Productive connections  Point-to-point communication  PtP communication  Interface isolated  RS232 interface  RS422 interface  RS485 interface  Connector  Transmission speed, min.  Transmission speed, max.  Cable length, max.  Point-to-point protocol  ASCII protocol	yes  4  -  yes  yes  yes  yes  -  yes  Sub-D, 9-pin, female  150 bit/s  115.5 kbit/s  500 m
PG/OP channel Number of connections, max.  Productive connections  Point-to-point communication  PtP communication  Interface isolated  RS232 interface  RS422 interface  RS485 interface  Connector  Transmission speed, min.  Transmission speed, max.  Cable length, max.  Point-to-point protocol  ASCII protocol	yes  4  -  yes  yes  yes  -  yes  Sub-D, 9-pin, female  150 bit/s  115.5 kbit/s  500 m  yes  yes
PG/OP channel  Number of connections, max.  Productive connections  Point-to-point communication  PtP communication  Interface isolated  RS232 interface  RS422 interface  RS485 interface  Connector  Transmission speed, min.  Transmission speed, max.  Cable length, max.  Point-to-point protocol  ASCII protocol  STX/ETX protocol  3964(R) protocol	yes  4  -  yes  yes  yes  yes  -  yes  Sub-D, 9-pin, female  150 bit/s  115.5 kbit/s  500 m  yes  yes
PG/OP channel Number of connections, max.  Productive connections  Point-to-point communication  PtP communication  Interface isolated  RS232 interface  RS422 interface  RS485 interface  Connector  Transmission speed, min.  Transmission speed, max.  Cable length, max.  Point-to-point protocol  ASCII protocol  STX/ETX protocol  RK512 protocol	yes  4  -  yes  yes  yes  -  yes  Sub-D, 9-pin, female  150 bit/s  115.5 kbit/s  500 m  yes  yes  yes
PG/OP channel Number of connections, max.  Productive connections  Point-to-point communication  PtP communication  Interface isolated  RS232 interface  RS422 interface  RS485 interface  Connector  Transmission speed, min.  Transmission speed, max.  Cable length, max.  Point-to-point protocol  ASCII protocol  STX/ETX protocol  RK512 protocol  USS master protocol	yes  4  -  yes  yes  yes  yes  -  yes  Sub-D, 9-pin, female  150 bit/s  115.5 kbit/s  500 m  yes  yes  yes  yes
PG/OP channel Number of connections, max.  Productive connections  Point-to-point communication  PtP communication  Interface isolated  RS232 interface  RS422 interface  RS485 interface  Connector  Transmission speed, min.  Transmission speed, max.  Cable length, max.  Point-to-point protocol  ASCII protocol  STX/ETX protocol  RK512 protocol	yes  4  -  yes  yes  yes  -  yes  Sub-D, 9-pin, female  150 bit/s  115.5 kbit/s  500 m  yes  yes  yes



Special protocols

Openial proteocie	
Housing	
Material	PPE
Mounting	Rail System 300
Mechanical data	
Dimensions (WxHxD)	80 mm x 125 mm x 120 mm
Net weight	420 g
Weight including accessories	-
Gross weight	-
Environmental conditions	
Operating temperature	0 °C to 60 °C
Storage temperature	-25 °C to 70 °C
Certifications	
UL certification	yes
KC certification	yes