SIEMENS

Data sheet

6ES7212-1AE31-0XB0

SIMATIC S7-1200, CPU 1212C, COMPACT CPU, DC/DC/DC, ONBOARD I/O: 8 DI 24V DC; 6 DO 24 V DC; 2 AI 0 - 10V DC, POWER SUPPLY: DC 20.4 - 28.8 V DC, PROGRAM/DATA MEMORY: 50 KB



General information	
Product type designation	CPU 1212C DC/DC/DC
Engineering with	
 Programming package 	STEP 7 V11 SP2 or higher
Supply voltage	
Rated value (DC)	
• 24 V DC	Yes
permissible range, lower limit (DC)	20.4 V
permissible range, upper limit (DC)	28.8 V
Load voltage L+	
 Rated value (DC) 	24 V
 permissible range, lower limit (DC) 	20.4 V
 permissible range, upper limit (DC) 	28.8 V
Input current	
Current consumption, max.	1.2 A; 24 V DC
Inrush current, max.	12 A; at 28.8 V DC
Output current	

for backplane bus (5 V DC), max.	1 000 mA; Max. 5 V DC for SM and CM
Encoder supply	
24 V encoder supply	
• 24 V	Permissible range: 20.4V to 28.8V
Dewerless	
Power loss Power loss, typ.	9 W
	- W
Memory	
Work memory	
• integrated	50 kbyte
• expandable	No
Load memory	
• integrated	1 Mbyte
Backup	
• present	Yes; maintenance-free
• without battery	Yes
CPU processing times for bit operations, typ.	0.085 μs; / instruction
for word operations, typ.	1.7 μ s; / instruction
for floating point arithmetic, typ.	$2.5 \ \mu s; / instruction$
for hoating point antimetic, typ.	2.5 µ3, / 1131 uction
CPU-blocks	
CPU-blocks Number of blocks (total)	DBs, FCs, FBs, counters and timers. The maximum number of
	addressable blocks ranges from 1 to 65535. There is no
Number of blocks (total)	
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Number of blocks (total) OB • Number, max. Data areas and their retentivity Retentive data area (incl. timers, counters, flags), max. Flag • Number, max. Address area I/O address area	addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used Limited only by RAM for code 10 kbyte 4 kbyte; Size of bit memory address area
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Number of blocks (total) OB • Number, max. Data areas and their retentivity Retentive data area (incl. timers, counters, flags), max. Flag • Number, max. Address area I/O address area • Inputs • Outputs Process image	addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used Limited only by RAM for code 10 kbyte 4 kbyte; Size of bit memory address area 1 024 byte
Number of blocks (total) OB • Number, max. Data areas and their retentivity Retentive data area (incl. timers, counters, flags), max. Flag • Number, max. Address area I/O address area • Inputs • Outputs Process image • Inputs, adjustable	addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used Limited only by RAM for code 10 kbyte 10 kbyte 4 kbyte; Size of bit memory address area 1 024 byte 1 024 byte 1 024 byte 1 024 byte 1 1 024 byte
Number of blocks (total) OB • Number, max. Data areas and their retentivity Retentive data area (incl. timers, counters, flags), max. Flag • Number, max. Address area I/O address area • Inputs • Outputs Process image • Inputs, adjustable • Outputs, adjustable	addressable blocks ranges from 1 to 65535. There is no restriction, the entire working memory can be used Limited only by RAM for code 10 kbyte 10 kbyte 4 kbyte; Size of bit memory address area 1 024 byte 1 024 byte 1 024 byte
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Time of day	
Clock	
 Hardware clock (real-time) 	Yes
Backup time	480 h; Typical
 Deviation per day, max. 	60 s/month at 25 °C
Digital inputs	
Number of digital inputs	8; Integrated
 of which inputs usable for technological functions 	4; HSC (High Speed Counting)
Source/sink input	Yes
Number of simultaneously controllable inputs	
all mounting positions	
— up to 40 °C, max.	8
Input voltage	
 Rated value (DC) 	24 V
● for signal "0"	5 V DC at 1 mA
● for signal "1"	15 V DC at 2.5 mA
Input current	
● for signal "1", typ.	1 mA
Input delay (for rated value of input voltage)	
for standard inputs	
— parameterizable	0.2 ms, 0.4 ms, 0.8 ms, 1.6 ms, 3.2 ms, 6.4 ms and 12.8 ms, selectable in groups of four
— at "0" to "1", min.	0.2 ms
— at "0" to "1", max.	12.8 ms
for interrupt inputs	
— parameterizable	Yes
for counter/technological functions	
— parameterizable	Single phase: 3 @ 100 kHz & 1 @ 30 kHz, differential: 3 @ 80 kHz & 1 @ 30 kHz
Cable length	
• shielded, max.	500 m; 50 m for technological functions
• unshielded, max.	300 m; For technological functions: No
Digital outputs	
Number of digital outputs	6
 of which high-speed outputs 	4; 100 kHz Pulse Train Output
Short-circuit protection	No; to be provided externally
Limitation of inductive shutdown voltage to	L+ (-48 V)
Switching capacity of the outputs	
 with resistive load, max. 	0.5 A
 on lamp load, max. 	5 W
Output voltage	

	0.1 V; with 10 kOhm load
• for signal "0", max.	
• for signal "1", min.	20 V
Output current	0.5.4
 for signal "1" rated value 	0.5 A
 for signal "0" residual current, max. 	0.1 mA
Output delay with resistive load	
• "0" to "1", max.	1 µs
● "1" to "0", max.	5 µs
Switching frequency	
 of the pulse outputs, with resistive load, max. 	100 kHz
Cable length	
• shielded, max.	500 m
• unshielded, max.	150 m
Analog inputs Number of analog inputs	2
	2
Input ranges	Yes
Voltage	
Input ranges (rated values), voltages	Vec
• 0 to +10 V	Yes
 Input resistance (0 to 10 V) 	≥100k ohms
Cable length	
 shielded, max. 	100 m; twisted and shielded
Analog outputs	
Number of analog outputs	0
Cable length	
• shielded, max.	100 m; shielded, twisted pair
Analog value generation for the inputs	
Integration and conversion time/resolution per channel	
 Resolution with overrange (bit including sign), 	10 bit
max.	
 Integration time, parameterizable 	Yes
 Conversion time (per channel) 	625 µs
Encoder	
Connectable encoders	
• 2-wire sensor	Yes
1. Interface	
Interface type	PROFINET
Physics	Ethernet
Isolated	Yes
automatic detection of transmission rate	Yes

Autonegotiation	Yes
Autocrossing	Yes
Functionality	
PROFINET IO Controller	Yes
Protocols	
Supports protocol for PROFINET IO	Yes
PROFIBUS	Yes
AS-Interface	Yes
Protocols (Ethernet)	
• TCP/IP	Yes
Further protocols	
• MODBUS	Yes
Communication functions	
S7 communication	
• supported	Yes
• as server	Yes
• as client	Yes
Open IE communication	
• TCP/IP	Yes
● ISO-on-TCP (RFC1006)	Yes
• UDP	Yes
Web server	
supported	Yes
User-defined websites	Yes
Test commissioning functions	
Status/control	
 Status/control variable 	Yes
• Variables	Inputs/outputs, memory bits, DBs, distributed I/Os, timers, counters
Forcing	
Forcing	Yes
Diagnostic buffer	
• present	Yes
Integrated Functions	
Number of counters	4
Counting frequency (counter) max.	100 kHz
Frequency meter	Yes
controlled positioning	Yes
PID controller	Yes
Number of alarm inputs	4
Number of pulse outputs	2

Limit frequency (pulse)	100 kHz
Potential separation	
Potential separation digital inputs	
 Potential separation digital inputs 	500V AC for 1 minute
 between the channels, in groups of 	1
Potential separation digital outputs	
 Potential separation digital outputs 	Yes
between the channels	No
 between the channels, in groups of 	1
Permissible potential difference between different circuits	500 V DC between 24 V DC and 5 V DC
	Sou v De between 24 v De and 3 v De
EMC	
Interference immunity against discharge of static electric	
 Interference immunity against discharge of static electricity acc. to IEC 61000-4-2 	Yes
— Test voltage at air discharge	8 kV
— Test voltage at contact discharge	6 kV
Interference immunity to cable-borne interference	
 Interference immunity on supply lines acc. to IEC 61000-4-4 	Yes
 Interference immunity on signal cables acc. to IEC 61000-4-4 	Yes
Interference immunity against voltage surge	
 on the supply lines acc. to IEC 61000-4-5 	Yes
Interference immunity against conducted variable distur	bance induced by high-frequency fields
 Interference immunity against high-frequency radiation acc. to IEC 61000-4-6 	Yes
Emission of radio interference acc. to EN 55 011	
 Limit class A, for use in industrial areas 	Yes; Group 1
• Limit class B, for use in residential areas	Yes; When appropriate measures are used to ensure compliance with the limits for Class B according to EN 55011
Degree and class of protection	
Degree of protection acc. to EN 60529	
• IP20	Yes
Standards, approvals, certificates	
CE mark	Yes
CSA approval	Yes
UL approval	Yes
cULus	Yes
FM approval	Yes
RCM (formerly C-TICK)	Yes

Marine approval Yes Arabient conditions Free fall Fall height, max. 0.3 m; five times, in product package Ambient temperature during operation imin. 20 °C max. 60 °C horizontal installation, min. 20 °C ib orizontal installation, max. 60 °C ib orizontal installation, max. 20 °C is efficial installation, max. 50 °C Ambient temperature during storage/transport. ib origonal installation, max. 100 °C in max. 70 °C Ambient temperature during storage/transport, min. 40 °C in max. 1080 hPa Storage/transport, min. 1080 hPa Storage/transport, max. Storage/transport, ma	Marine approval	
Free fall Fall height, max. 0.3 m; five times, in product package Ambient temperature during operation min. 20 °C max. 60 °C horizontal installation, min. 20 °C horizontal installation, max. 60 °C vertical installation, max. 60 °C vertical installation, max. 50 °C Ambient temperature during storage/transportation min. -20 °C Ambient temperature during storage/transportation min. -20 °C Ambient temperature during storage/transportation min. max. 70 °C Ambient temperature during storage/transport and the stock to the stock to the stock and the sto	Marine approval	Yes
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• horizontal installation, min. -20 °C • horizontal installation, max. 60 °C • vertical installation, min. -20 °C • vertical installation, max. 50 °C Ambient temperature during storage/transportation -40 °C • min. -40 °C • max. 70 °C Ambient temperature during storage/transportation -40 °C • max. 70 °C Ambient temperature during storage/transport. 70 °C Ambient temperature during storage/transport. 70 °C • Operation, min. 795 hPa • Operation, max. 1080 hPa • Storage/transport, max. 1080 hPa • Storage/transport, max. 1080 hPa • permissible operating height -1000 to 2000 m Relative humidity - • permissible range (without condensation) at 25 °C 95 %; no condensation Vibrations 2 g (m/s ⁺) wall mounting, 1 g (m/s ⁺) DIN rail • Operation, tested according to IEC 60068-2-6 Yes Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms Extended ambient conditions So2: < 0.5 ppm; H2S; < 0.1 ppm; RH < 60% condensation-free		-20 °C
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• horizontal installation, max. 60 °C • vertical installation, min. -20 °C • vertical installation, max. 50 °C Ambient temperature during storage/transportation -40 °C • max. 70 °C Air pressure acc. to IEC 60068-2-13 -40 °C • Operation, min. 795 hPa • Operation, max. 1080 hPa • Storage/transport, min. 660 hPa • Storage/transport, max. 1080 hPa • permissible operating height -1000 to 2000 m Relative humidity - • permissible range (without condensation) at 25 °C 95 % • Operation, tested according to IEC 60068-2-61 Yes Shock test - • Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail • Operation, tested according to IEC 60068-2-67 Yes Shock test - • tested according to IEC 60068-2-27 Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms Extended ambient conditions So2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	 horizontal installation. min. 	-20 °C
• vertical installation, min. -20 °C • vertical installation, max. 50 °C Ambient temperature during storage/transportation -40 °C • max. 70 °C Air pressure acc. to IEC 60068-2-13 - • Operation, min. 795 hPa • Operation, max. 1 080 hPa • Operation, max. 1 080 hPa • Storage/transport, min. 660 hPa • Storage/transport, max. 1 080 hPa • permissible operating height -1000 to 2000 m Relative humidity - • operation, max. 95 % • C - • Operation, max. 95 %; no condensation Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail • Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail • Operation, tested according to IEC 60068-2-6 Yes Shock test - • tested according to IEC 60068-2-27 Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms Extended ambient conditions - SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free		60 °C
• vertical installation, max. 50 °C Ambient temperature during storage/transportation -40 °C • max. 70 °C Air pressure acc. to IEC 60068-2-13 - • Operation, min. 795 hPa • Operation, max. 1080 hPa • Storage/transport, min. 660 hPa • Storage/transport, max. 1080 hPa • permissible operating height -1000 to 2000 m Relative humidity - • permissible range (without condensation) at 25 °C 95 %. • C 95 %; no condensation • Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail • Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail • tested according to IEC 60068-2-27 Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms Extended ambient conditions So2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free		-20 °C
Ambient temperature during storage/transportation • min. -40 °C • max. 70 °C Air pressure acc. to IEC 60068-2-13 • Operation, min. 795 hPa • Operation, max. 1 080 hPa • Storage/transport, min. 660 hPa • Storage/transport, max. 1 080 hPa • permissible operating height -1000 to 2000 m Relative humidity 95 % • C 95 %; no condensation • Operation, max. 95 %; no condensation • Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail • Operation, tested according to IEC 60068-2-6 Yes Shock test Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms Extended ambient conditions So2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free		50 °C
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• max.70 °CAir pressure acc. to IEC 60068-2-13795 hPa• Operation, min.795 hPa• Operation, max.1080 hPa• Storage/transport, min.660 hPa• Storage/transport, max.1080 hPa• permissible operating height-1000 to 2000 mRelative humidity-1000 to 2000 m• permissible range (without condensation) at 25 °C95 %• Operation, max.95 %; no condensation• Vibrations2 g (m/s²) wall mounting. 1 g (m/s²) DIN rail• Vibrations2 g (m/s²) wall mounting. 1 g (m/s²) DIN rail• Vibrations2 g (m/s²) wall mounting. 1 g (m/s²) DIN rail• ConfigurationYesPollutant concentrationsS02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free		-40 °C
Air pressure acc. to IEC 60068-2-13 • Operation, min. 795 hPa • Operation, max. 1 080 hPa • Storage/transport, min. 660 hPa • Storage/transport, max. 1 080 hPa • permissible operating height -1000 to 2000 m • Relative humidity -1000 to 2000 m • permissible range (without condensation) at 25 °C 95 % • Operation, max. 95 %; no condensation • Vibrations 2 g (m/s²) wall mounting. 1 g (m/s²) DIN rail • Vibrations 2 g (m/s²) wall mounting. 1 g (m/s²) DIN rail • Operation, tested according to IEC 60068-2-6 Yes Shock test - • tested according to IEC 60068-2-7 Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms Extended ambient conditions So2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free		70 °C
• Operation, min. 795 hPa • Operation, max. 1 080 hPa • Storage/transport, min. 660 hPa • Storage/transport, max. 1 080 hPa • permissible operating height -1000 to 2000 m Relative humidity - • permissible range (without condensation) at 25 95 % °C 95 %; no condensation • Operation, max. 95 %; no condensation Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail • Operation, tested according to IEC 60068-2-6 Yes Shock test - • tested according to IEC 60068-2-27 Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms Extended ambient conditions - Pollutant concentrations - - SO2 at RH < 60% without condensation	Air pressure acc. to IEC 60068-2-13	
• Operation, max.1 080 hPa• Storage/transport, min.660 hPa• Storage/transport, max.1 080 hPa• permissible operating height-1000 to 2000 mRelative humidity95 %• permissible range (without condensation) at 25 °C95 %• Operation, max.95 %; no condensation• Vibrations2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail• Vibrations2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail• Coperation, tested according to IEC 60068-2-6Yes;Shock testyaue), duration 11 ms• tested according to IEC 60068-2-27Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 msExtended ambient conditionsS02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free		795 hPa
 Storage/transport, max. Storage/transport, max. 1080 hPa permissible operating height -1000 to 2000 m Relative humidity permissible range (without condensation) at 25 °C Operation, max. 95 %; no condensation Vibrations Q g (m/s²) wall mounting, 1 g (m/s²) DIN rail Operation, tested according to IEC 60068-2-6 Shock test tested according to IEC 60068-2-6 Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms Extended ambient conditions Pollutant concentrations SO2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free Configuration Programming Programming language LAD Yes 		1 080 hPa
• Storage/transport, max.1 080 hPa• permissible operating height-1000 to 2000 mRelative humidity-1000 to 2000 m• permissible range (without condensation) at 25 °C95 %• Operation, max.95 %; no condensation• Operations2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail• Vibrations2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail• Operation, tested according to IEC 60068-2-6YesShock test	 Storage/transport, min. 	660 hPa
• permissible operating height -1000 to 2000 m Relative humidity 95 % • permissible range (without condensation) at 25 °C 95 % • Operation, max. 95 %; no condensation Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail • Operation, tested according to IEC 60068-2-6 Yes Shock test Yes • tested according to IEC 60068-2-27 Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms Extended ambient conditions S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free		1 080 hPa
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°C 95 %; no condensation • Operation, max. 95 %; no condensation Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail • Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail • Operation, tested according to IEC 60068-2-6 Yes Shock test Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms Extended ambient conditions So2: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free	Relative humidity	
• Operation, max.95 %; no condensationVibrations2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail• Vibrations (Operation, tested according to IEC 60068-2-6)YesShock testYes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms• tested according to IEC 60068-2-27Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 msExtended ambient conditions- SO2 at RH < 60% without condensation	 permissible range (without condensation) at 25 	95 %
Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail • Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail • Operation, tested according to IEC 60068-2-6 Yes Shock test Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms Extended ambient conditions Pollutant concentrations — SO2 at RH < 60% without condensation	°C	
 Vibrations 2 g (m/s²) wall mounting, 1 g (m/s²) DIN rail Operation, tested according to IEC 60068-2-6 Yes Shock test tested according to IEC 60068-2-27 Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms Extended ambient conditions Pollutant concentrations — SO2 at RH < 60% without condensation S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free Configuration Programming Programming language — LAD Yes 	 Operation, max. 	95 %; no condensation
 Operation, tested according to IEC 60068-2-6 Shock test tested according to IEC 60068-2-27 Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms Extended ambient conditions Pollutant concentrations — SO2 at RH < 60% without condensation S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free Configuration Programming Programming language — LAD Yes 	Vibrations	
Shock test • tested according to IEC 60068-2-27 Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms Extended ambient conditions • Ollutant concentrations - SO2 at RH < 60% without condensation	Vibrations	2 g (m/s ²) wall mounting, 1 g (m/s ²) DIN rail
 tested according to IEC 60068-2-27 Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms Extended ambient conditions Pollutant concentrations — SO2 at RH < 60% without condensation S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free Configuration Programming Programming language — LAD Yes 	 Operation, tested according to IEC 60068-2-6 	Yes
value), duration 11 ms Extended ambient conditions Pollutant concentrations - SO2 at RH < 60% without condensation	Shock test	
Pollutant concentrations — SO2 at RH < 60% without condensation	• tested according to IEC 60068-2-27	Yes; IEC 68, Part 2-27 half-sine: strength of the shock 15 g (peak value), duration 11 ms
	Extended ambient conditions	
Configuration Programming Programming language - LAD Yes	Pollutant concentrations	
Programming Programming language - LAD Yes	— SO2 at RH < 60% without condensation	S02: < 0.5 ppm; H2S: < 0.1 ppm; RH < 60% condensation-free
Programming language — LAD Yes		
— LAD Yes		
	Programming language	
— FBD Yes	— LAD	
— SCL Yes		Yes
Cycle time monitoring	Cycle time monitoring	

• adjustable	Yes
Dimensions	
Width	90 mm
Height	100 mm
Depth	75 mm
Weights	
Weight, approx.	370 g

last modified:

03/16/2017