

## Data sheet

SM 231 (231-1BF00)

Technical data

Selected information       Note     -       Features     16 Br (2-Lein) 16 Br (2-Lein) 17 Br (2-Lein) 16 Br (2-Lein) 17 Br (2-Lein) 17 Br (2-Lein) 18 Br	Order no.	231-1BF00
Selected information       Note     -       Features     16 Br (2-Lein) 16 Br (2-Lein) 17 Br (2-Lein) 16 Br (2-Lein) 17 Br (2-Lein) 17 Br (2-Lein) 18 Br	Туре	SM 231
Peatures     Bx AI 16 Br (2-Laitar) 16 Br (2-Laitar) Netrige 060 mV Persistance thermoneter, thermocouple persistance thermoneter, thermocouple Parameterizable       Current consumption from backplane bus     280 mA       Power loss     1.4 W       Tochnical data analog inputs     8       Cathol data analog inputs     8       Cable length, shielded     200 m       Cathol cathol gata analog inputs     8       Cathol cathol gata analog inputs     8       Cathol cathol gata analog inputs     9       Vamber of inputs     8       Cathol cathol gata analog inputs     9       Values of inputs     8       Cathol cathol gata analog with SFU     -       Deparational limit d voltage ranges with SFU     -       Dataset error limit voltage ranges with SFU     -       Dataset error limit voltage ranges with SFU     -       Dataset error limit voltage     -	General information	
16 Bit (2-Leiter) Voltage 060 mV Resistance thermometer, thermocouple Parameterizable     Current consumption/power loss   280 mA     Power loss   1.4 W     Technical data analog inputs   8     Cable length, shielded   200 m     Rated load voltage   -     Current consumption from backplane bus   8     Cable length, shielded   200 m     Rated load voltage   -     Current consumption from load voltage L+ (without load)   -     Porentional limit do voltage ranges   0 mV +60 mV     Operational limit do voltage ranges   0 mV +60 mV     Operational limit do voltage ranges with SFU   -     Sasic error limit voltage ranges with SFU   -     Destruction limit voltage ranges with SFU   -     Sasic error limit voltage ranges with SFU   -     Destruction limit voltage ranges with SFU   -     Oparational limit do current ranges   -     Syndhelergenze Strombereiche   -     Oparational limit do current ranges with SFU   -     Datarticol limit corrent ranges with SFU   -     Datarticol limit corrent ranges with SFU   -     Datarticol limit corrent ranges with	Note	-
Current consumption from backplane bus280 mAPower loss1.4 WTechnical data analog inputs8Cable length, shielded200 mRated load voltage-Cable length, shielded200 mRated load voltage-Current cossumption from load voltage L+ (without load)-/ foltage inputsyesWin. input resistance (voltage range)2 MOhmOperational limit of voltage ranges0 mV +60 mVOperational limit of voltage ranges-Operational limit of voltage ranges+/0.1%Basic error limit voltage ranges with SFU-Basic error limit voltage ranges with SFU-Operational limit of current ranges-Operational limit of current ranges with SFU-Operational limit of resistor ranges-Operational limit of resistor ranges-Operational limit dirent ranges with SFU <td>Features</td> <td>16 Bit (2-Leiter) 4x 16 Bit (4-Leiter) Voltage 060 mV Resistance thermometer, thermocouple</td>	Features	16 Bit (2-Leiter) 4x 16 Bit (4-Leiter) Voltage 060 mV Resistance thermometer, thermocouple
Power loss     1.4 W       Fechnical data analog inputs     8       Cable length, shielded     200 m       Rated load voltage     -       Current consumption from load voltage L+ (without load)     -       Voltage inputs     yes       Min. input resistance (voltage range)     2 MOhm       nput voltage ranges     0 mV +60 mV       Operational limit of voltage ranges     -       Discont limit voltage ranges     -       Sasic error limit voltage ranges with SFU     -       Sasic error limit voltage ranges     +/-0.1%       Varrent limit voltage ranges with SFU     -       Destruction limit voltage ranges     -       Max. input resistance (current range)     -       nuct current ranges     -       Surrent limit voltage ranges with SFU     -       Secturent initi current ranges with SFU     -       Secturent limit druerent ranges with SFU	Current consumption/power loss	
Technical data analog inputs       Number of inputs     8       Cable length, shielded     200 m       Rated load voltage     -       Current consumption from load voltage L+ (without load)     -       //oltage inputs     yes       Win. input resistance (voltage ranges)     2 MOhm       Deperational limit of voltage ranges     0 mV +60 mV       Operational limit of voltage ranges     -       Deperational limit of voltage ranges with SFU     -       Sasic error limit voltage ranges with SFU     -       Deperational limit of voltage ranges with SFU     -       Sasic error limit voltage ranges with SFU     -       Destruction limit voltage ranges with SFU     -       Max. input resistance (current range)     -       Awa, input resistance (current range)     -       Awa, input esistance (current ranges     -       Operational limit of current ranges     -       Deperational limit of current ranges with SFU     -       Saudical error limit current ranges with SFU     -       Deperational limit of current ranges with SFU     -       Secure rol limit current ranges with SFU     -	Current consumption from backplane bus	280 mA
Number of inputs     8       Cable length, shielded     200 m       Rated load voltage     -       Current consumption from load voltage L+ (without load)     -       Voltage inputs     Yes       Win. input resistance (voltage range)     2 MOhm       opprational limit of voltage ranges     0 mV +60 mV       Opperational limit of voltage ranges     -       Opprational limit of voltage ranges with SFU     -       Basic error limit voltage ranges with SFU     -       Opprational limit of voltage ranges     +/0.1%       Basic error limit voltage ranges     +/0.1%       Current inputs     -       Deprational limit of voltage ranges     +/0.1%       Struction limit voltage     -       Deprational limit of voltage ranges     +/0.1%       Struction limit voltage     -       Struction limit voltage     -       Diperational limit of current ranges     -       Struction limit of current ranges     -       Opprational limit of current ranges with SFU     -       Diperational limit of current ranges with SFU     -       Struction limit current ranges with SFU	Power loss	1.4 W
Cable length, shielded200 mRated load voltage-Current consumption from load voltage L+ (without load)-Voltage inputsyesWin. input resistance (voltage range)2 MOhmnput voltage ranges0 mV +60 mVOperational limit of voltage ranges-Operational limit of voltage ranges+/-0.1%Basic error limit voltage ranges with SFU-Sasic error limit voltage ranges+/-0.1%Basic error limit voltage ranges-Max. input resistance (current range)-Portational limit of current ranges-Operational limit of current ranges with SFU-Operational limit of current ranges with SFU-Operational limit of current ranges-Contrent ranges-Radical error limit current ranges with SFU-Operational limit of resistor ranges-Operational limit of resistor ranges-Operat	Technical data analog inputs	
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Durrent consumption from load voltage L+ (without load)     -       Voltage inputs     yes       Win. input resistance (voltage range)     2 MOhm       nput voltage ranges     0 mV +60 mV       Operational limit of voltage ranges     -       Operational limit of voltage ranges with SFU     -       Basic error limit voltage ranges with SFU     -       Basic error limit voltage ranges with SFU     -       Destruction limit voltage ranges with SFU     -       Max. input resistance (current range)     -       Max. input resistance (current ranges)     -       Awar, input resistance (current ranges)     -       Operational limit of current ranges     -       Operational limit of current ranges with SFU     -       Operational limit of current ranges     -       Operational limit of current ranges with SFU     -       Struction limit current ranges with SFU     -       Destruction limit current ranges with SFU     -       Struction limit current ranges with SFU     -       Struction limit current ranges with SFU     -       Destruction limit current ranges with SFU     -       Struction limit current rang	Cable length, shielded	200 m
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DescriptionCompositionOperational limit of voltage ranges-Deperational limit of voltage ranges with SFU-Basic error limit voltage ranges with SFU-Destruction limit voltagemax. 15VCurrent ranges-Nax. input resistance (current range)-nput current ranges-Operational limit of current ranges-Operational limit of current ranges with SFU-Structfon limit current ranges with SFU-Structfon limit current ranges with SFU-Destruction limit current ranges with SFU-Destruction limit current inputs (electrical current)-Destruction limit current inputs (voltage)-Destruction limit current inputs (voltage)-Resistance inputs-Operational limit of resistor ranges-Operational limit of resistor ranges-<	Min. input resistance (voltage range)	2 MOhm
Deperational limit of voltage ranges with SFU-Basic error limit voltage ranges with SFU-Basic error limit voltage ranges with SFU-Destruction limit voltagemax. 15VCurrent inputs-Ax. input resistance (current range)-nput current ranges-Operational limit of current ranges-Deparational limit of current ranges-Operational limit of current ranges with SFU-Schudelergrenze Strombereiche-Basica error limit current ranges with SFU-Deparational limit current ranges with SFU-Schudelergrenze Strombereiche-Basica error limit current inputs (electrical current)-Destruction limit current inputs (voltage)-Destruction limit for ranges-Deparational limit of resistor rang	Input voltage ranges	0 mV +60 mV
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Basic error limit voltage ranges with SFU-Destruction limit voltagemax. 15VCurrent inputs-Max. input resistance (current range)-nput current ranges-Operational limit of current ranges with SFU-Operational limit of current ranges with SFU-Structfon limit current ranges with SFU-Grundfehlergrenze Strombereiche-Radical error limit current inputs (electrical current)-Destruction limit current inputs (voltage)-Resistance ranges-Operational limit of resistor ranges with SFU-Destructional limit of resistor ranges with SFU-Destruction limit current inputs (voltage)-Resistance ranges-Operational limit of resistor ranges with SFU-Destruction limit resistor ranges with SFU-Destruction limit for resistor ranges-Operational limit of resistor ranges-Operational limit of resistor ranges-Destruction limit resistance inputs-Basic error limit with SFU-Destruction limit resistance inputs-Resistance thermometer inputsyesResistance thermometer rangesPt100	Operational limit of voltage ranges with SFU	-
Destruction limit voltagemax. 15VCurrent inputs-Max. input resistance (current range)-nput current ranges-Operational limit of current ranges-Operational limit of current ranges with SFU-Operational limit of current ranges with SFU-Stundfehlergrenze Strombereiche-Radical error limit current ranges with SFU-Destruction limit current inputs (electrical current)-Destruction limit current inputs (voltage)-Resistance ranges-Operational limit of resistor ranges with SFU-Destruction limit for resistor ranges-Resistance ranges-Operational limit of resistor ranges-Operational limit of resistor ranges with SFU-Basic error limit-Operational limit of resistor ranges-Operational limit of resistance inputs-Operational limit of	Basic error limit voltage ranges	+/-0.1%
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nput current ranges-Operational limit of current ranges-Operational limit of current ranges with SFU-Grundfehlergrenze Strombereiche-Radical error limit current ranges with SFU-Operational limit of current ranges with SFU-Destruction limit current inputs (electrical current)-Operational limit of resistor ranges-Resistance ranges-Operational limit of resistor ranges with SFU-Operational limit of resistor ranges-Operational limit of resistor ranges with SFU-Basic error limit-Basic error limit with SFU-Operational limit of resistor ranges-Operational limit of resistor ranges- <tr< td=""><td>Current inputs</td><td>-</td></tr<>	Current inputs	-
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Deperational limit of current ranges with SFU-Grundfehlergrenze Strombereiche-Radical error limit current ranges with SFU-Destruction limit current inputs (electrical current)-Destruction limit current inputs (voltage)-Resistance inputs-Resistance ranges-Operational limit of resistor ranges with SFU-Destruction limit of resistor ranges with SFU-Operational limit of resistor ranges with SFU-Basic error limit-Basic error limit with SFU-Destruction limit resistance inputs-Resistance thermometer inputs-Resistance thermometer rangesPt100	Input current ranges	-
Grundfehlergrenze Strombereiche-Radical error limit current ranges with SFU-Destruction limit current inputs (electrical current)-Destruction limit current inputs (voltage)-Resistance inputs-Resistance ranges-Operational limit of resistor ranges with SFU-Destruction limit of resistor ranges-Operational limit of resistor ranges with SFU-Basic error limit-Basic error limit tof SFU-Destruction limit resistance inputs-Basic error limit with SFU-Destruction limit resistance inputs-Resistance thermometer inputs-Resistance thermometer rangesPt100	Operational limit of current ranges	-
Radical error limit current ranges with SFU-Destruction limit current inputs (electrical current)-Destruction limit current inputs (voltage)-Resistance inputs-Resistance ranges-Operational limit of resistor ranges-Operational limit of resistor ranges with SFU-Basic error limit-Basic error limit-Destruction limit resistance inputs-Basic error limit-Basic error limit with SFU-Destruction limit resistance inputs-Pestruction limit resistance inputs-Pestru	Operational limit of current ranges with SFU	-
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Resistance ranges-Operational limit of resistor ranges-Operational limit of resistor ranges with SFU-Basic error limit-Basic error limit with SFU-Operational limit resistance inputs-Resistance thermometer rangesPt100	Destruction limit current inputs (voltage)	-
Operational limit of resistor ranges   -     Operational limit of resistor ranges with SFU   -     Basic error limit   -     Basic error limit with SFU   -     Destruction limit resistance inputs   -     Resistance thermometer ranges   Pt100	Resistance inputs	-
Operational limit of resistor ranges with SFU   -     Basic error limit   -     Basic error limit with SFU   -     Destruction limit resistance inputs   -     Resistance thermometer ranges   Pt100	Resistance ranges	-
Basic error limit -   Basic error limit with SFU -   Destruction limit resistance inputs -   Resistance thermometer inputs yes   Resistance thermometer ranges Pt100	Operational limit of resistor ranges	-
Basic error limit with SFU -   Destruction limit resistance inputs -   Resistance thermometer inputs yes   Resistance thermometer ranges Pt100	Operational limit of resistor ranges with SFU	-
Destruction limit resistance inputs -   Resistance thermometer inputs yes   Resistance thermometer ranges Pt100	Basic error limit	-
Resistance thermometer inputs yes   Resistance thermometer ranges Pt100	Basic error limit with SFU	-
Resistance thermometer ranges Pt100	Destruction limit resistance inputs	-
	Resistance thermometer inputs	yes
Derational limit of resistance thermometer ranges -	Resistance thermometer ranges	Pt100
· · · · · · · · · · · · · · · · · · ·	Operational limit of resistance thermometer ranges	-

## YASKAWA

Operational limit of resistance thermometer ranges with SFU

Operational limit of resistance thermometer ranges with SFU	-
Basic error limit thermoresistor ranges	±0.15% (2-wire) ±0.15% (4-wire)
Basic error limit thermoresistor ranges with SFU	-
Destruction limit resistance thermometer inputs	max. 15V
Thermocouple inputs	yes
Thermocouple ranges	type J type K type T
Operational limit of thermocouple ranges	
Operational limit of thermocouple ranges with SFU	-
Basic error limit thermocouple ranges	±0.1% (Compensation external) ±1.0% (internal)
Basic error limit thermocouple ranges with SFU	-
Destruction limit thermocouple inputs	max. 15V
Programmable temperature compensation	yes
External temperature compensation	yes
Internal temperature compensation	yes
Temperature error internal compensation	4 K
Technical unit of temperature measurement	°C, °F
Resolution in bit	16
Measurement principle	Sigma-Delta
Basic conversion time	6.75 ms 268 ms
Noise suppression for frequency	50 Hz and 60 Hz
Initial data size	16 Byte
Status information, alarms, diagnostics	
Status display	none
Interrupts	yes
Process alarm	no
Diagnostic interrupt	yes, parameterizable
Diagnostic functions	yes
Diagnostics information read-out	possible
Supply voltage display	none
Group error display	red SF LED
Channel error display	red LED per channel
Isolation	
Between channels	-
Between channels of groups to	-
Between channels and backplane bus	yes
Between channels and power supply	-
Max. potential difference between circuits	-
Max. potential difference between inputs (Ucm)	DC 15 V
Max. potential difference between Mana and Mintern (Uiso)	-
Max. potential difference between inputs and Mana (Ucm)	-
Max. potential difference between inputs and Mintern (Uiso)	DC 75 V/ AC 15 V
Max. potential difference between Mintern and outputs	-
Insulation tested with	DC 500 V
Datasizes	
Input bytes	16
Output bytes	0
Parameter bytes	12

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## **YASKAWA**

Diagnostic bytes	12
Housing	
Material	PPE / PA 6.6
Mounting	Profile rail 35 mm
Mechanical data	
Dimensions (WxHxD)	25.4 mm x 76 mm x 88 mm
Net weight	90 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	-