

RCM

Modbus

GridVis® Analysis software

Harmonics via analysis channel

Alarm management

20 current channels



UMG 20CM – 20 Channel Branch Circuit Monitoring Device with RCM

Interfaces / communication

- RS485
- Modbus RTU

Accuracy of measurement

- Active energy Class 1
- Current: 0.5 %
- Voltage: 0.5 %

Power quality

- Harmonics up to 63rd harmonic (analysis channel)
- Crest factor / total harmonic distortion
- Minimum and maximum values for currents with time stamp
- Threshold value for each current channel / limit value bit

• 20 Current measurement channels

- True RMS measurement
- High sampling rate at 20 kHz
- Operating current and residual current monitoring (RCM)

2 digital outputs (open collector)

- Pulse output kWh / kvarh
- Relay / PLC inputs

Network visualisation software

- GridVis®-Basic (in the scope of supply)



Areas of application



- Continuous acquisition of the operating currents
- Permanent residual current monitoring
- Messages in the event of the nominal current being exceeded
- Energy acquisition for complete current distribution
- Cost centre accounting
- Transparency of energy costs
- More effective use of IT infrastructure
- PDUs in data centres
- Increase of high availability power supply

Main features



RCM and energy measurement device in a single unit

- 20 current measurement channels +/- 0.5 %
- 4 voltage measurement channels +/- 0.5 %
- Internal RS485 interface (Modbus as Slave)
- 20 LEDs – One LED for each current channel (Green = o.k., Yellow = Warning; Red = Nominal current exceed)
- Measurement range of operation current with burden up to 63 A with closed or split core current transformers (standard measured values: V, A, kW, kVA, kVar, kWh)

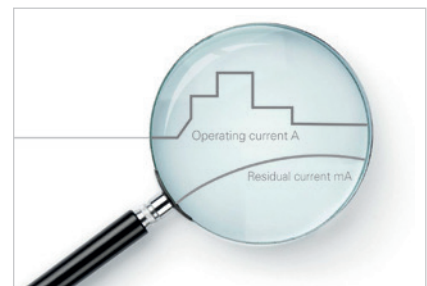


Fig.: Operating current and RCM fault current monitoring

The system for smart people

- Compact nature of the system
- Can be retrofitted to existing systems
- Modbus RTU directly on board
- State indication per channel (LEDs)
- Name stored per channel in the measurement device
- Wide range power adapter (90 – 276 V ... AC / DC)
- Integration in the GridVis® software
- Diverse current transformer variants for the individual application
- Measurement variants:
 - Three-phase and single-phase energy measurement
 - RCM measurement three-phase and single-phase
- High sampling rate 20,000 Hz
- Current transformer connection monitoring (i.e. wire break will be detected)
- Harmonics analysis up to 63rd harmonic via analysis channel
- Saving of minimum and maximum values with time stamp
- Standard measured values: V, A, kW, kVA, kVar, kWh (variable list)
- Scalability of the system

The system

Power supply without drop-outs

- Permanent monitoring and logging of processes in TN-S or TN-C-S systems
- Simple parameterisation and operation of the RCM measurement
- Automatic reporting in the event of problems enables a rapid initiation of countermeasures
- Comprehensive diagnostics increase safety and efficiency of a company



Alarms before failures (preventative residual current analysis)

- Faults arising will be detected in good time
- Monitoring, evaluation and reporting of creeping increases in residual currents (e.g. triggered by insulation faults and operating currents for system parts or loads being too high)
- Reduction of downtimes

Sensors for energy management

- Energy data of a large number of loads can be acquired and passed to a database with ease
- Automatic reading out and saving of the measured values and data saved in the measurement devices as well as the exceedance of parameterised threshold values
- Channel-specific measured values of the current monitoring devices can be displayed via the GridVis® software
 - The progression of measured values is visualised graphically
 - Display of warnings or fault messages possible, e.g. via the topology views.
 - Associated message texts can be freely configured for this
 - Automatic sending of an email in the event of operational or fault messages
 - Remote monitoring of the entire system is possible via internet
 - Residual current and operational current monitoring devices can be parameterised via GridVis® (Modbus)
- The evaluation and saving of data in central databases is implemented via the GridVis® software
- The greater the scope of information, the more accurate the determination of savings potentials
- Energy optimisation offers a higher, more economical savings potential (ISO 50001)

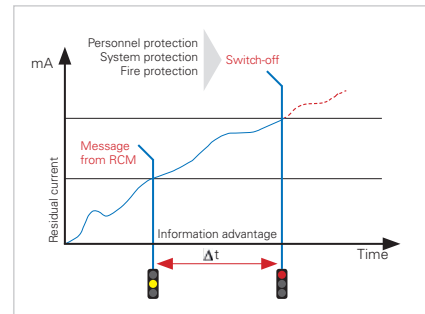


Fig.: Message before shut-down - an objective of residual current monitoring

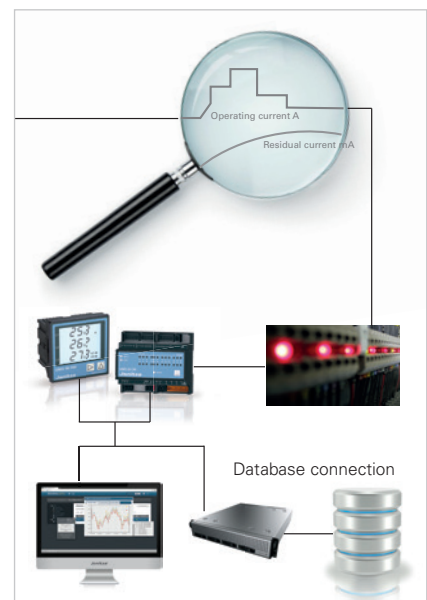


Fig.: Read-out, analysis and saving of energy data

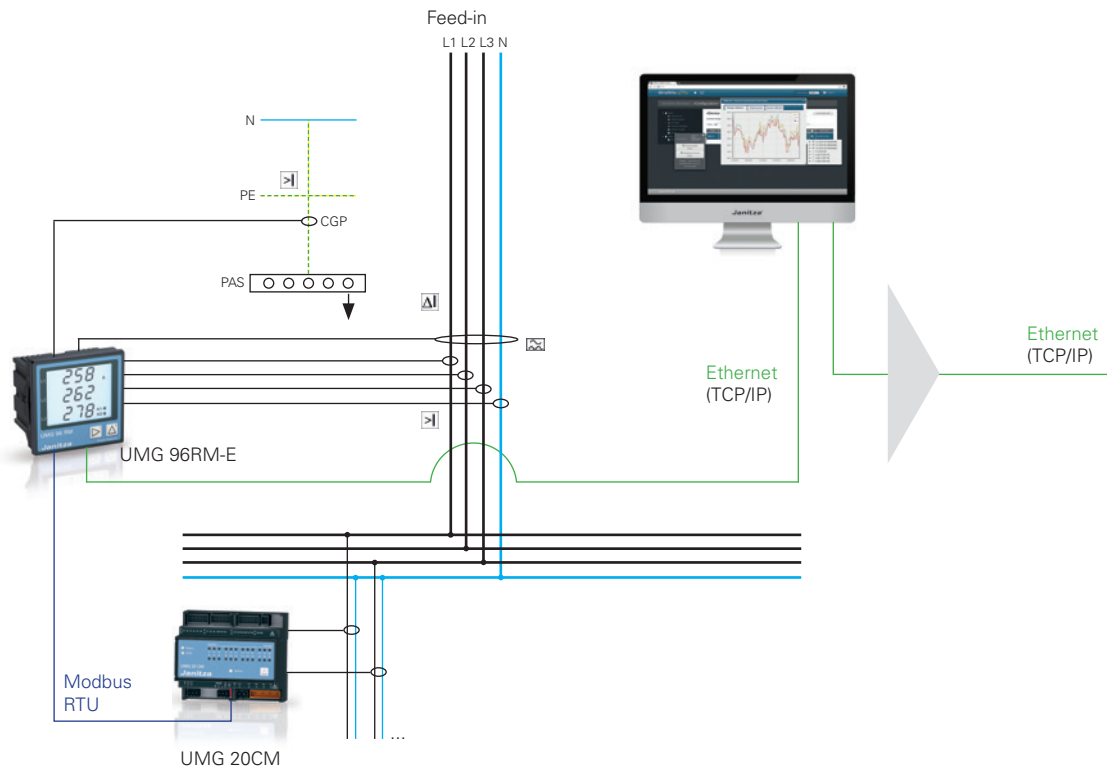


Fig.: The 20 channels of the UMG 20CM can be optionally used for residual current or operational current monitoring by utilising the corresponding current measurement transformer. In the case of residual current monitoring, the residual currents flowing to ground or any other path are acquired.

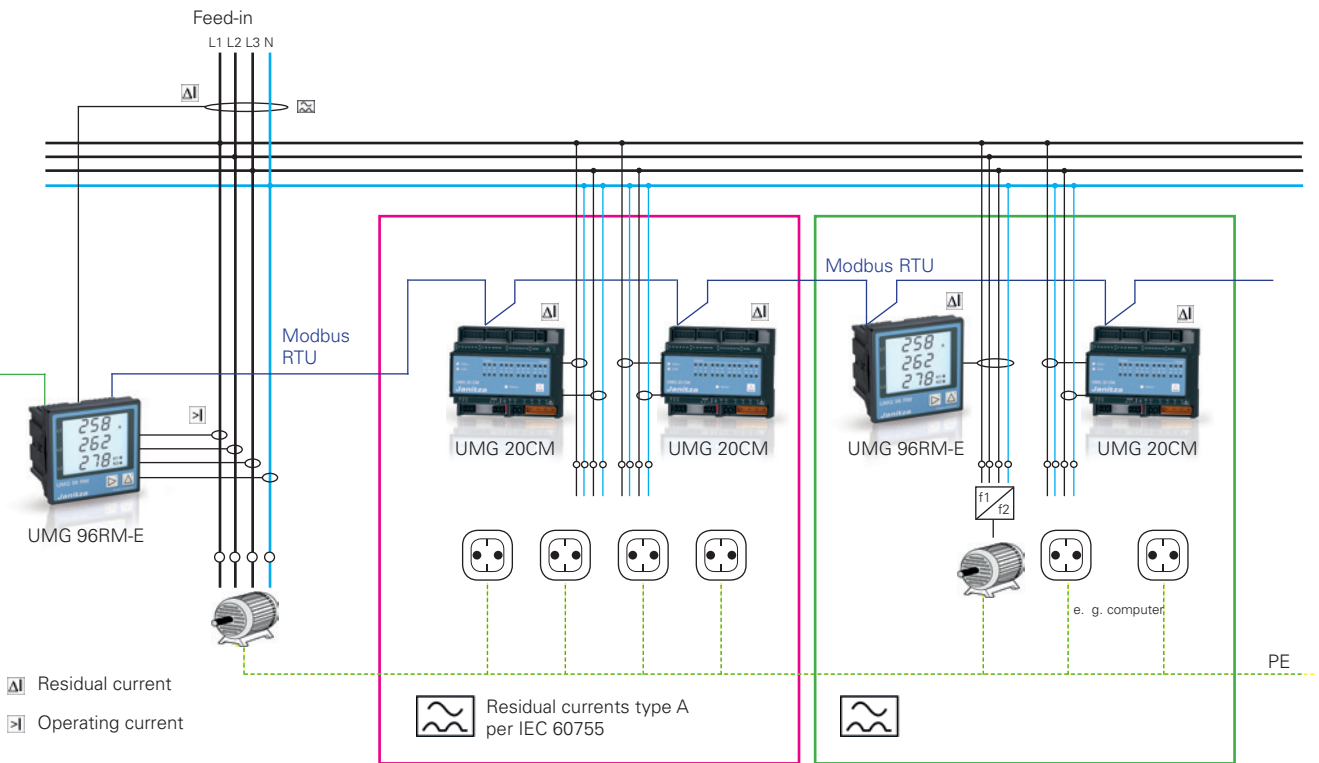
Your benefits

The intelligent system solution

- Early warning with system failures
- Avoidance of costly and hazardous system downtimes; the availability of systems is increased
- Localisation of individual faulty feeders, reduced work when troubleshooting
- Early detection of an overloading of the N conductor and critical residual currents, resulting in increased fire safety
- Through parameterisation of the system in new condition and constant monitoring, all changes to the system state after the point of commissioning can be detected
- Fulfilment of the safety criteria "RCM residual current monitoring" in data centres
- Convenient monitoring and parameterisation solution with GridVis® software
- Operating current acquisition of all relevant consumers as a basis for an energy management system (EnMS)

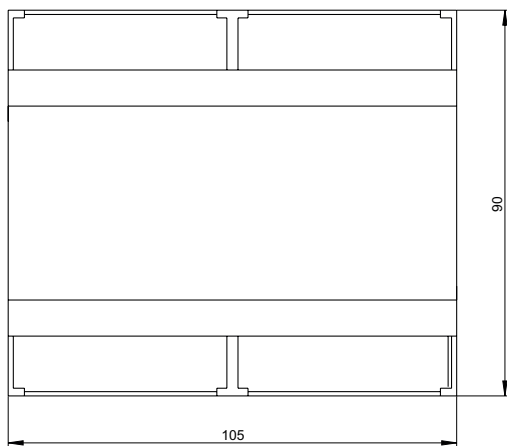


Fig.: Constant processes and highly sensitive applications such as data centres, are based on RCM monitoring.

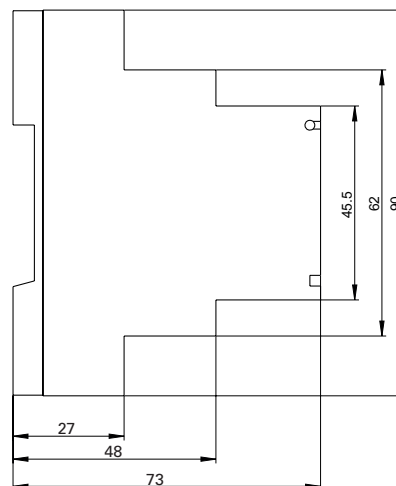


Dimension diagrams

All dimensions in mm



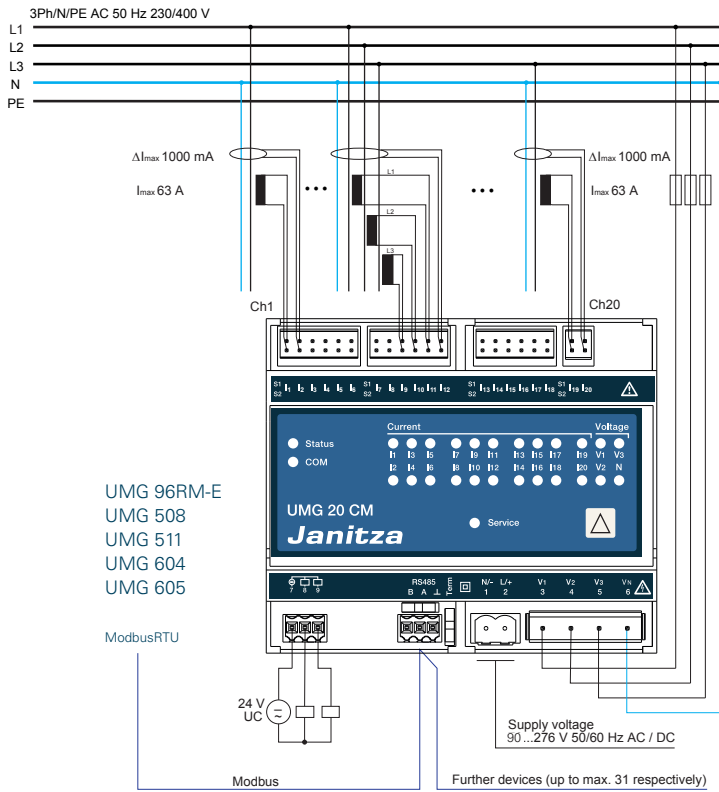
Front view



Side view



Typical connection



Device overview and technical data

UMG 20CM	
Item number	14.01.625
Operating voltage	90 ... 276 V AC / DC
General	
Use in low and medium voltage networks	•
Accuracy voltage measurement	0.5 %
Accuracy current measurement	0.5 %
Accuracy active energy (kWh)	Class 1
Number of measurement points per period	400
Uninterrupted measurement	•
RMS - momentary value	
Current, voltage, frequency	•
Active, reactive and apparent power for each of the 20 current inputs	•
Power factor for each of the 20 current inputs	•
Energy measurement	
Active energy (for each of the 20 current inputs, + 7 aggregating channels)	•
Recording of the mean values	
Current / present, minimum and maximum	•
Active power / present, minimum and maximum	•
Frequency / present	•
Aggregating channels	7

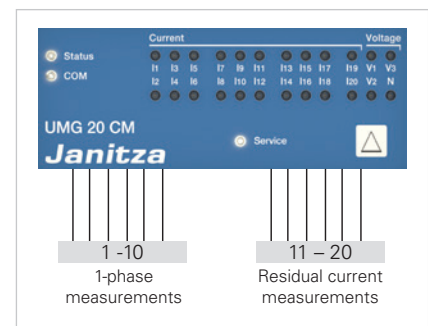


Fig.: 10 single-phase operational current measurements, 10 single-phase residual current measurements,

Comment: For detailed technical information please refer to the operation manual and the Modbus address list.

• = included - = not included

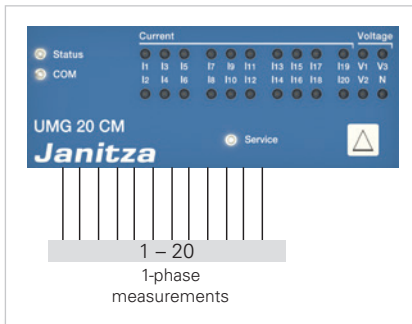


Fig.: 20 single-phase operating current or RCM measurements

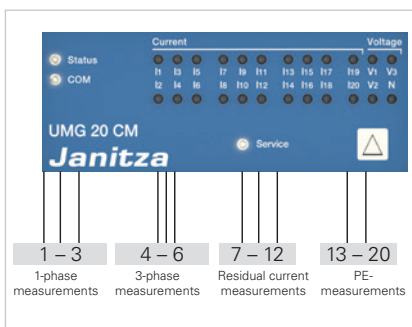


Fig.: 3 single-phase operational current measurements,
1 three-phase operational current measurement,
6 single-phase residual current measurements,
8 single-phase PE measurements

RCM measurement	
Residual current monitoring for all 20 channels (selectable)	•
Current transformer connection monitoring (i.e. wire break will be detected)	•
Power quality measurements	
Harmonics per order / current and voltage (absolute and in %)	1st – 63rd
Distortion factor THD-I in %	•
Under and overcurrent recording	•
Crest factor	•
Measured data recording	
Minimum, maximum values	•
Measured data channels	24
Alarm messages	•
Time stamp	•
Displays and inputs / outputs	
LCD display	-
LEDs (3 states each)	27
Digital outputs (as switch or pulse output)	2
Voltage measurement inputs	L1, L2, L3 + N
Current measurement inputs	20
Communication	
Interfaces	
RS485: 9.6 – 115.2 kbps (Screw-type terminal)	•
Protocols	
Modbus RTU (Slave)	•
Software GridVis®-Basic*1	
Online and historic graphs	•
Databases (Janitza DB, Derby DB); MySQL, MS SQL with higher GridVis® versions)	•
Manual reports (energy, power quality)	•
Graphical programming	•
Topology views	•
Manual read-out of the measuring devices	•
Graph sets	•
Technical data	
Type of measurement	Constant true RMS up to the 63rd harmonic
Nominal voltage, three-phase, 4-conductor (L-N, L-L)	230 / 400 V AC
Measurement in quadrants	4
Networks	TN, TT, IT
Measurement in single-phase / multi-phase networks	1 ph, 2 ph, 3 ph, 4 ph and up to 20 times 1 ph
Measured voltage input	
Overvoltage category	300 V CAT III
Measured range, voltage L-N, AC (without potential transformer)	10 ... 300 Vrms
Measured range, voltage L-L, AC (without potential transformer)	18 ... 480 Vrms
Resolution	0.1 V
Impedance	1.3 MOhm / phase
Frequency measuring range	45 ... 65 Hz
Sampling frequency	20 kHz / phase
Measured current input	
Evaluation range of the operating current	0 ... 600 A
Evaluation range of the residual current	10 ... 1,000 mA
Resolution	1 mA
Digital inputs and outputs	
Number of digital outputs	2
Switching voltage	max. 60 V DC, 30 V AC
Maximum current	350 mA
Switch-on resistance	2 Ohm
Maximum cable length	up to 30 m unshielded, from 30 m shielded

Comment: For detailed technical information please refer to the operation manual and the Modbus address list.

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*1 Optional additional functions with the packages GridVis®-Professional, GridVis®-Enterprise and GridVis®-Service.

Mechanical properties	
Weight	270 g
Device dimensions in mm (H x W x D)	90 x 105 x approx. 73
Protection class per EN 60529	IP20
Assembly per IEC EN 60999-1 / DIN EN 50022	35-mm DIN rail
Environmental conditions	
Temperature range	Operation: K55 (-10 ... +55 °C)
Relative humidity	Operation: 5 to 95 % (at 25 °C)
Operating height	0 ... 2,000 m above sea level
Degree of pollution	3
Installation position	user-defined
Electromagnetic compatibility	
Electromagnetic compatibility of electrical equipment	Directive 2004/108/EC
Electrical appliances for application within particular voltage limits	Directive 2006/95/EC
Equipment safety	
Safety requirements for electrical equipment for measurement, regulation, control and laboratory use – Part 1: General requirements	IEC/EN 61010-1
Part 2-030: Particular requirements for testing and measuring circuits	IEC/EN 61010-2-030
Noise immunity	
Class A: Industrial environment	IEC/EN 61326-1
Electrostatic discharge	IEC/EN 61000-4-2
Voltage dips	IEC/EN 61000-4-11
Emissions	
Class B: Residential environment	IEC/EN 61326-1
RFI Field Strength 30 – 1,000 MHz	IEC/CISPR11/EN 55011
Radiated interference voltage 0.15 – 30 MHz	IEC/CISPR11/EN 55011
Safety	
Europe	CE labelling
Firmware	
Firmware update	Update via GridVis® software. Firmware download (free of charge) from the website: http://www.janitza.com/downloads/



Fig.: Residual current transformer for the acquisition of residual currents. Different configurations and sizes allow use in almost all applications (see chapter 06, current / voltage transformers and sensors).

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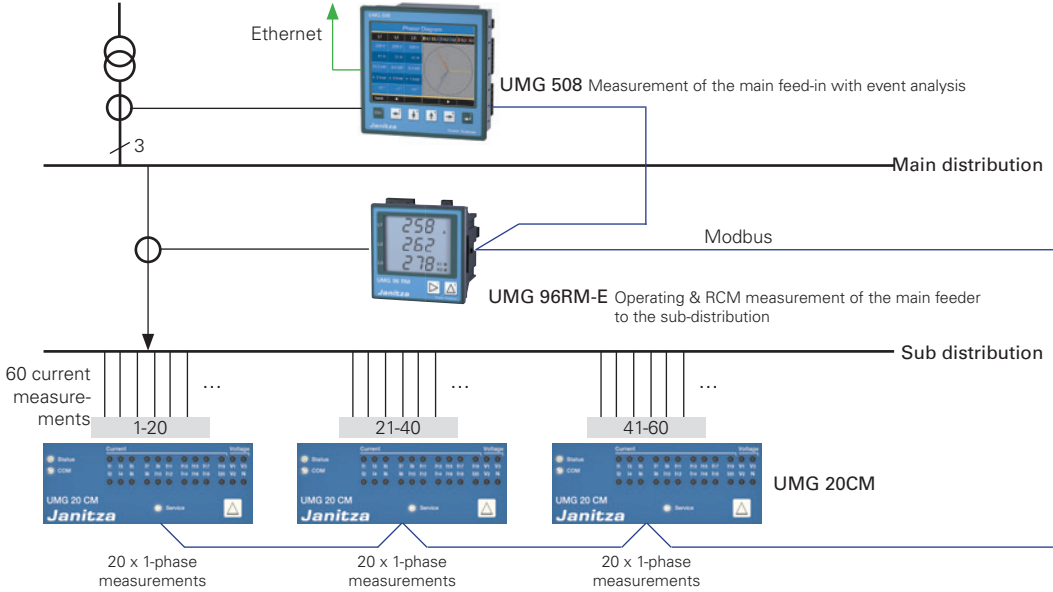


Fig.: Extremely compact solution for complete monitoring via three levels with leading-edge master-slave communication architecture

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