KCM13x

- **Comprises a wide variety of instrumentation for protection, control and regulation of DC electrical parameters or physical parameters**
- **DC Voltage or Current Guards and Controllers**
- **DC Signal Slave Controllers**
- **Analogue Signal Controllers**
- **Triple relay for more flexibility**
- **Up to two individual very fast analogue output signals (<50mS), (optional)**
- **DIN96 Slave Indicator with status LEDs (optional)**

Specifications

Monitored Voltage:	100-120V, 200-240V, 380-415V, 440-460V, 480VAC 40-70Hz (Fuse 0,5A)
Optional Separate Auxiliary Voltage AC:	100-120V, 200-240V, 380-415V, 440-460V, 480VAC 40-70Hz (Fuse 0,5A)
Optional Separate Auxiliary Voltage DC:	24-60VDC (Fuse 0,5A) 110-220VDC (Fuse 1A)
Supply tolerance:	+10%, -20%
Power rating:	5VA
Current Input:	1A CT or 5A CT, <0,1VA
Contact rating:	AC: 100VA -250V/2A max. DC: 50W -100V/1A max.
Adjustments:	Depending on the selected model (see page 2 & 3)
Output range:	Any % of the scale
Analogue output 1: (see page 5 for available outputs)	mA: Up to 20mA, max 500R V: Up to 10V, min 100kohm (other on request)
Analogue output 2: (see page 5 for available outputs)	mA: Up to 20mA, max 500R V: Up to 10V, min 500ohm (other on request)
Accuracy:	Class 0,5
Temperature:	-20 to +70ºC
Humidity, relative:	0-95%
Weight:	0.6kgs
Front protection:	IP21
Flammability:	UL94-V0

The unit meets EN 60255-27 Cat. III, Pollution degree 2 and the relevant environmental and EMC tests specified in EN 60255-26 to comply with the requirements of the major Classification Societies.

Related information:
The KCM13x series are also available for panel mounting as KPM13x series.

Description

The KCM13x is a digitally controlled guard/controller for use in a large range of applications such as power guards, load controller, DC current guards, DC voltage guards, etc. As an analogue controller it can be used to monitor a large range of physical parameters as flow, pressure, temperature, length, weight and more.

The standard models takes the auxiliary supply voltage from the monitored voltage (terminal 1 & 2).

It can also be delivered with optional separate DC auxiliary voltage (terminal 26 & 27), but that must be specified when ordering (see page 4 for ordering code for separate Aux. Supply).

User settable trip levels and delays. Colour of LEDs indicate alarm status. Alarm LEDs flash during count-down.

LED status		
Power	Low	High
Normal	Alarm	Alarm

Start of monitoring function is delayed when power is switched on (default 2 secs delay). In this way false tripping during power up is avoided.

The DIN-rail mounted instrument reads the monitored parameter. The optional slave watt-meter and the triple-zone status LEDs at a glance gives the clear safety message, typically (depending on the selected model, see page 2, 3, & 4):

- HIGH
- LOW
- NORMAL

OUTPUTS
Up to two individual very fast analogue output signals (optional) proportional to monitored parameters (see page 2, 3 & 4 for models with outputs). This may be used as an input to a control system, to detect abnormal power conditions (loss of excitation etc). If output is used for remote meter reading, we recommend 0-1mA for the slave indicator.

RELAY OUTPUTS
Relay operation depends on the selected model (see page 2, 3 & 4). Other combinations are available on

KCM13x

Description

Relay Operation

The relay operation is delayed in the arrow direction, the reset is instantaneous. Both trip levels can, independently, individually set over the full range

Analogue Level Controllers / Guards

KCM13M13x

Relay Configuration: Differential

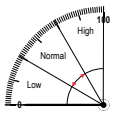
A Low / High Universal Level Controller

It is operating from mA or volt output of any transmitter or converter for monitoring of most physical parameters like Flow, Volume, RPM, Vibration, Time, Pressure, Temperature, Level, Length, Weight, Angle, RH, Dewpoint, pH, Lux, UV exposure etc. Scaled to customer requirement. The unit has one low and one high alarm relay with adjustable hysteresis.

Relay trip lamps flash instantly (approx. 1 flash per second) when the trip level is passed, the relay trips after elapsed delay. The lamp changes state and the trip relay operates after the pre-set delay. If a trip condition ends during the delay interval, the timer will automatically reset (only on Non-Latching models).

Relay	Low	High	N/A	Fail Safe	Latch	Fixed Hysteresis	Adjustable Hysteresis	N/A	N/A
R1		X		X	X		X		
R2	X				X		X		
R3	X			X	X				

Models	Latch	Output 1	Output 2
KCM13M13E	-	-	-
KCM13M13FA	-	X	-
KCM13M13FB	-	X	X
KCM13M13G	X	-	-
KCM13M13GFA	X	X	-
KCM13M13GFB	X	X	X



Adjustments	Trip level	Delay
Low:	0-100% of Range	0-30secs
High:	0-100% of Range	0-30secs
Hysteresis Low:	2-50% of Range	
Hysteresis High:	2-50% of Range	

Relays shown de-energised. R1 & R3 are fail-safe and energises when unit is powered.
Hysteresis adjustments does not apply to latch versions.

KCM13M23x

Relay Configuration: Cascade

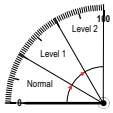
A two level Universal Level Controller

It is operating from mA or volt output of any transmitter or converter for monitoring of most physical parameters like Flow, Volume, RPM, Vibration, Time, Pressure, Temperature, Level, Length, Weight, Angle, RH, Dewpoint, pH, Lux, UV exposure etc. Scaled to customer requirement. The unit has one low and one high alarm relay with adjustable hysteresis.

Relay trip lamps flash instantly (approx. 1 flash per second) when the trip level is passed, the relay trips after elapsed delay. The lamp changes state and the trip relay operates after the pre-set delay. If a trip condition ends during the delay interval, the timer will automatically reset (only on Non-Latching models).

Relay	Level 1	Level 2	N/A	Fail Safe	Latch	Fixed Hysteresis	Adjustable Hysteresis	N/A	N/A
R1		X		X	X		X		
R2	X				X		X		
R3	X			X	X				

Models	Latch	Output 1	Output 2
KCM13M23E	-	-	-
KCM13M23FA	-	X	-
KCM13M23FB	-	X	X
KCM13M23G	X	-	-
KCM13M23GFA	X	X	-
KCM13M23GFB	X	X	X



Adjustments	Trip level	Delay
Level 1:	0-100% of Range	0-30secs
Level 2:	0-100% of Range	0-30secs
Hysteresis L.1:	2-50% of Range	
Hysteresis L.2:	2-50% of Range	

Relays shown de-energised. R1 & R3 are fail-safe and energises when unit is powered.
Hysteresis adjustments does not apply to latch versions.

DC Voltage Guards

KCM13V15x

Relay Configuration: Differential

DC Over and Under Voltage Guard

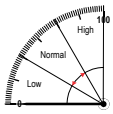
A DC voltage guard with direct input up to 400VDC. Input from voltage divider with grounded negative for any voltage range.

The unit is used for protection of any DC motor or mains.

Relay trip lamps flash instantly (approx. 1 flash per second) when the trip level is passed, the relay trips after elapsed delay. The lamp changes state and the trip relay operates after the pre-set delay. If a trip condition ends during the delay interval, the timer will automatically reset (only on Non-Latching models).

Relay	Low	High	N/A	Fail Safe	Latch	Fixed Hysteresis	Adjustable Hysteresis	N/A	N/A
R1		X		X	X		X		
R2	X			X	X		X		
R3	X	X		X	X				

Models	Latch	Output 1	Output 2
KCM13V15E	-	-	-
KCM13V15FA	-	X	-
KCM13V15FB	-	X	X
KCM13V15G	X	-	-
KCM13V15GFA	X	X	-
KCM13V15GFB	X	X	X



Adjustments	Trip level	Delay
Low:	0-100% of Range	0-30secs
High:	0-100% of Range	0-30secs
Hysteresis Low:	2-50% of Range	
Hysteresis High:	2-50% of Range	

Relays shown de-energised. R1, R2 & R3 are fail-safe and energises when unit is powered.
Hysteresis adjustments does not apply to latch versions.

KCM13V16x

Relay Configuration: Bi-Polar 2

DC Bi-Polar Voltage Guard

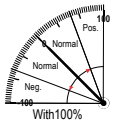
A DC voltage guard with direct input up to +/- 400VDC. Input from voltage divider with grounded negative for any voltage range.

The unit is used for protection of any DC motor or mains.

Relay trip lamps flash instantly (approx. 1 flash per second) when the trip level is passed, the relay trips after elapsed delay. The lamp changes state and the trip relay operates after the pre-set delay. If a trip condition ends during the delay interval, the timer will automatically reset (only on Non-Latching models).

Relay	Low (Neg.)	High (Pos.)	N/A	Fail Safe	Latch	Fixed Hysteresis	Adjustable Hysteresis	N/A	N/A
R1		X		X	X		X		
R2	X			X	X		X		
R3	X	X		X	X				

Models	Latch	Output 1	Output 2
KCM13V16E	-	-	-
KCM13V16FA	-	X	-
KCM13V16FB	-	X	X
KCM13V16G	X	-	-
KCM13V16GFA	X	X	-
KCM13V16GFB	X	X	X



With100% negative range

Adjustments	Trip level	Delay
Low:	0-100% of Range	0-30secs
High:	0-100% of Range	0-30secs
Hysteresis Low:	2-50% of Range	
Hysteresis High:	2-50% of Range	

Relays shown de-energised. R1, R2 & R3 are fail-safe and energises when unit is powered.
Hysteresis adjustments does not apply to latch versions.

The MEGACON policy is one of continuous improvement, consequently equipment supplied may vary in detail from this publication.

Depending on application, select the model that matches the electrical installation.
If none of the listed models fit your purpose please contact Megacon for customer adaptation.

IS range

Description

Relay Operation

The relay operation is delayed in the arrow direction, the reset is instantaneous. Both trip levels can, independently, individually set over the full range

Power Guards

KCM13M173x

Relay Configuration: Bi-Polar 1

Bi-Directional Active (kW) Power Guard

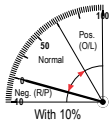
It is operating from mA output of a matching kW power transducer, it monitors forward and reverse active load of generators. The unit has one overload and two reverse power relay. The overload relay have adjustable hysteresis and can be used to release and re-entry non essential load.

Relay trip lamps flash instantly (approx. 1 flash per second) when the trip level is passed, the relay trips after elapsed delay. The lamp changes state and the trip relay operates after the pre-set delay. If a trip condition ends during the delay interval, the timer will automatically reset (only on Non-Latching models).

Relay	R/P (Neg.)	O/L (Pos.)	N/A	Fail Safe	Latch	Fixed Hysteresis	Adjustable Hysteresis	N/A	N/A
R1		X			*X		X		
R2	X			X	X				
R3	X			X	X				

Models	Latch	Output 1	Output 2
KCM13M173E	X	-	-
KCM13M173FA	X	X	-
KCM13M173FB	X	X	X
KCM13M173G*	X	-	-
KCM13M173GFA*	X	X	-
KCM13M173GFB*	X	X	X

(*R1 is only latch on G models)



With 10% negative range

Adjustments	Trip level	Delay
Reverse Power:	0-20% of Range	0-30secs
Overload:	0-100% of Range	0-30secs
Hysteresis O/L:	2-50% of Range	

Relays shown de-energised. R2 & R3 are fail-safe and energises when unit is powered.
Hysteresis adjustments does not apply to latch versions.

KCM13M193x

Relay Configuration: Bi-Polar 1

Bi-Directional Reactive (kVAr) Power Guard

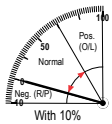
It is operating from mA output of a matching kVAr power transducer, it monitors forward and reverse active load of generators. The unit has one overload and two reverse power relay. The overload relay have adjustable hysteresis and can be used to release and re-entry non essential load.

Relay trip lamps flash instantly (approx. 1 flash per second) when the trip level is passed, the relay trips after elapsed delay. The lamp changes state and the trip relay operates after the pre-set delay. If a trip condition ends during the delay interval, the timer will automatically reset (only on Non-Latching models).

Relay	R/P (Neg.)	O/L (Pos.)	N/A	Fail Safe	Latch	Fixed Hysteresis	Adjustable Hysteresis	N/A	N/A
R1		X			*X		X		
R2	X			X	X				
R3	X			X	X				

Models	Latch	Output 1	Output 2
KCM13M193E	X	-	-
KCM13M193FA	X	X	-
KCM13M193FB	X	X	X
KCM13M193G*	X	-	-
KCM13M193GFA*	X	X	-
KCM13M193GFB*	X	X	X

(*R1 is only latch on G models)



With 10% negative range

Adjustments	Trip level	Delay
Reverse Power:	0-20% of Range	0-30secs
Overload:	0-100% of Range	0-30secs
Hysteresis O/L:	2-50% of Range	

Relays shown de-energised. R2 & R3 are fail-safe and energises when unit is powered.
Hysteresis adjustments does not apply to latch versions.

Power Controllers / Guards

KCM13M151x

Relay Configuration: Differential

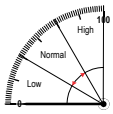
AC Power Controller

It is operating on a output from the MCE105 generator controller or from any low level DC signal i.e. 0-5V, 4-20mA etc. When used as a "Total power" instrument it monitors the combined output of a generator system. The relays can be used to automatically start and stop generators in a simple system or for preferential tripping. As a "Surplus power" instrument, it monitors the remaining available power and therefore the relays can be used for load blocking of heavy loads.

Relay trip lamps flash instantly (approx. 1 flash per second) when the trip level is passed, the relay trips after elapsed delay. The lamp changes state and the trip relay operates after the pre-set delay. If a trip condition ends during the delay interval, the timer will automatically reset (only on Non-Latching models).

Relay	Low	High	N/A	Fail Safe	Latch	Fixed Hysteresis	Adjustable Hysteresis	N/A	N/A
R1	X			X	X		X		
R2		X			X		X		
R3	X	X		X	X				

Models	Latch	Output 1	Output 2
KCM13M151E	-	-	-
KCM13M151FA	-	X	-
KCM13M151FB	-	X	X
KCM13M151G	X	-	-
KCM13M151GFA	X	X	-
KCM13M151GFB	X	X	X



Adjustments	Trip level	Delay
Low:	0-100% of Range	0-30secs
High:	0-100% of Range	0-30secs
Hysteresis Low:	2-50% of Range	
Hysteresis High:	2-50% of Range	

Relays shown de-energised. R1 & R3 are fail-safe and energises when unit is powered.
Hysteresis adjustments does not apply to latch versions.

KCM13M154x

Relay Configuration: Differential

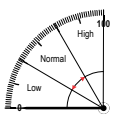
AC Power Controller

It is operating on a output from balance lines from the MCE105 generator controller or from any low level DC voltage signal i.e. 0-5V, 0-8V etc. By monitoring the load balance lines of the MCE105, the instrument will indicate the total percentage of power from the generators in use regardless of the number of generators running. The trip relays can be used to automatically start and stop generators based purely on percentage of generated power. Scaled with 0-100%kW.

Relay trip lamps flash instantly (approx. 1 flash per second) when the trip level is passed, the relay trips after elapsed delay. The lamp changes state and the trip relay operates after the pre-set delay. If a trip condition ends during the delay interval, the timer will automatically reset (only on Non-Latching models).

Relay	Low	High	N/A	Fail Safe	Latch	Fixed Hysteresis	Adjustable Hysteresis	N/A	N/A
R1	X			X	X		X		
R2		X			X		X		
R3	X	X		X	X				

Models	Latch	Output 1	Output 2
KCM13M154E	-	-	-
KCM13M154FA	-	X	-
KCM13M154FB	-	X	X
KCM13M154G	X	-	-
KCM13M154GFA	X	X	-
KCM13M154GFB	X	X	X



Adjustments	Trip level	Delay
Low:	0-100% of Range	0-30secs
High:	0-100% of Range	0-30secs
Hysteresis Low:	2-50% of Range	
Hysteresis High:	2-50% of Range	

Relays shown de-energised. R1 & R3 are fail-safe and energises when unit is powered.
Hysteresis adjustments does not apply to latch versions.

The MEGACON policy is one of continuous improvement, consequently equipment supplied may vary in detail from this publication.

Depending on application, select the model that matches the electrical installation.
If none of the listed models fit your purpose please contact Megacon for customer adaptation.

IS range

KCM13x

Description

Relay Operation

The relay operation is delayed in the arrow direction, the reset is instantaneous. Both trip levels can, independently, individually set over the full range

Current Guards

KCM13C121x

Relay Configuration: Differential

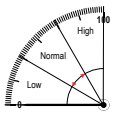
DC Over and Under Current Guard

Direct input up to 1ADC, input from standard 60-150mV measuring shunt from 1ADC to 30.000ADC. The unit is used for selective current protection of DC loads such as motors, generators etc. Relays are differential configured.

Relay trip lamps flash instantly (approx. 1 flash per second) when the trip level is passed, the relay trips after elapsed delay. The lamp changes state and the trip relay operates after the pre-set delay. If a trip condition ends during the delay interval, the timer will automatically reset (only on Non-Latching models).

Relay	Low	High	N/A	Fail Safe	Latch	Fixed Hysteresis	Adjustable Hysteresis	N/A	N/A
R1		X		X	X		X		
R2	X				X		X		
R3	X	X		X	X				

Models	Latch	Output 1	Output 2
KCM13C121E	-	-	-
KCM13C121FA	-	X	-
KCM13C121FB	-	X	X
KCM13C121G	X	-	-
KCM13C121GFA	X	X	-
KCM13C121GFB	X	X	X



Adjustments	Trip level	Delay
Low:	0-100% of Range	0-30secs
High:	0-100% of Range	0-30secs
Hysteresis Low:	2-50% of Range	
Hysteresis High:	2-50% of Range	

Relays shown de-energised. R1 & R3 are fail-safe and energises when unit is powered.
Hysteresis adjustments does not apply to latch versions.

KCM13C123x

Relay Configuration: Cascade

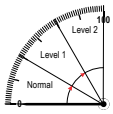
DC Two Level Over Current Guard

Direct input up to 1ADC, input from standard 60-150mV measuring shunt from 1ADC to 30.000ADC. The unit is used for selective current protection of DC loads such as motors, generators etc. Relays are cascade configured.

Relay trip lamps flash instantly (approx. 1 flash per second) when the trip level is passed, the relay trips after elapsed delay. The lamp changes state and the trip relay operates after the pre-set delay. If a trip condition ends during the delay interval, the timer will automatically reset (only on Non-Latching models).

Relay	Level 1	Level 2	N/A	Fail Safe	Latch	Fixed Hysteresis	Adjustable Hysteresis	N/A	N/A
R1	X				X		X		
R2		X		X	X		X		
R3	X	X		X	X				

Models	Latch	Output 1	Output 2
KCM13C123E	-	-	-
KCM13C123FA	-	X	-
KCM13C123FB	-	X	X
KCM13C123G	X	-	-
KCM13C123GFA	X	X	-
KCM13C123GFB	X	X	X



Adjustments	Trip level	Delay
Level 1:	0-100% of Range	0-30secs
Level 2:	0-100% of Range	0-30secs
Hysteresis L.1:	2-50% of Range	
Hysteresis L.2:	2-50% of Range	

Relays shown de-energised. R2 & R3 are fail-safe and energises when unit is powered.
Hysteresis adjustments does not apply to latch versions.

KCM13C126x

Relay Configuration: Bi-Polar 2

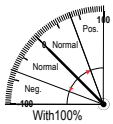
DC Bi-Polar Current Guard

Direct input up to 1ADC, input from standard 60-150mV measuring shunt from 1ADC to 30.000ADC. The unit is designed for both level and polarity of DC current to provide dual polarity excess current protection like a charge/ discharge guard. Relays are differential configured.

Relay trip lamps flash instantly (approx. 1 flash per second) when the trip level is passed, the relay trips after elapsed delay. The lamp changes state and the trip relay operates after the pre-set delay. If a trip condition ends during the delay interval, the timer will automatically reset (only on Non-Latching models).

Relay	Low (Neg.)	High (Pos.)	N/A	Fail Safe	Latch	Fixed Hysteresis	Adjustable Hysteresis	N/A	N/A
R1		X			X		X		
R2	X				X		X		
R3	X	X		X	X				

Models	Latch	Output 1	Output 2
KCM13C126E	-	-	-
KCM13C126FA	-	X	-
KCM13C126FB	-	X	X
KCM13C126G	X	-	-
KCM13C126GFA	X	X	-
KCM13C126GFB	X	X	X



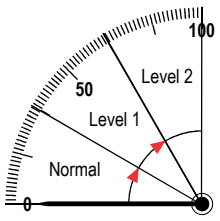
With100% negative range

Adjustments	Trip level	Delay
Low (Neg.):	0-100% of Range	0-30secs
High (Pos.):	0-100% of Range	0-30secs
Hysteresis Low:	2-50% of Range	
Hysteresis High:	2-50% of Range	

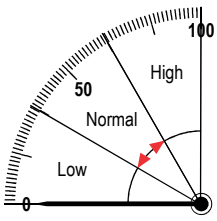
Relays shown de-energised. R3 is fail-safe and energises when unit is powered.
Hysteresis adjustments does not apply to latch versions.

Relay Configurations

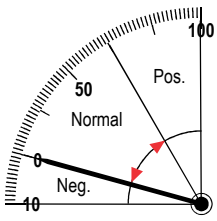
The difference between the configurations is the **direction** the relay time delay. The relay operation is delayed in the arrow direction, the reset is instantaneous. Both trip levels can, independently, individually set over the scale range (0-100% Range). The Bi-Polar versions are available with 10% or 100% negative scale.



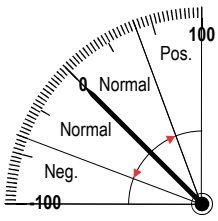
Cascade



Differential



Bi-Polar 1



Bi-Polar 2

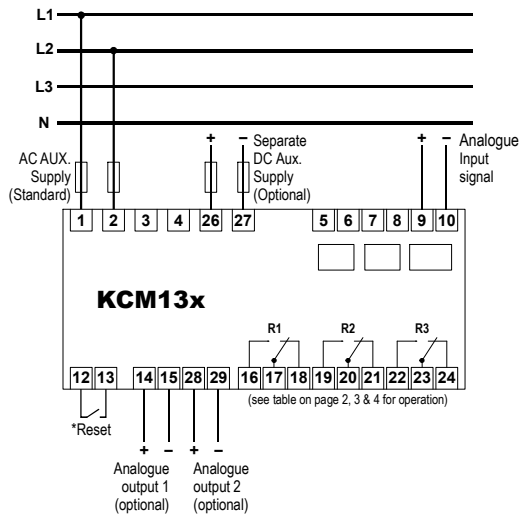
The MEGACON policy is one of continuous improvement, consequently equipment supplied may vary in detail from this publication.

Depending on application, select the model that matches the electrical installation.
If none of the listed models fit your purpose please contact Megacon for customer adaptation.

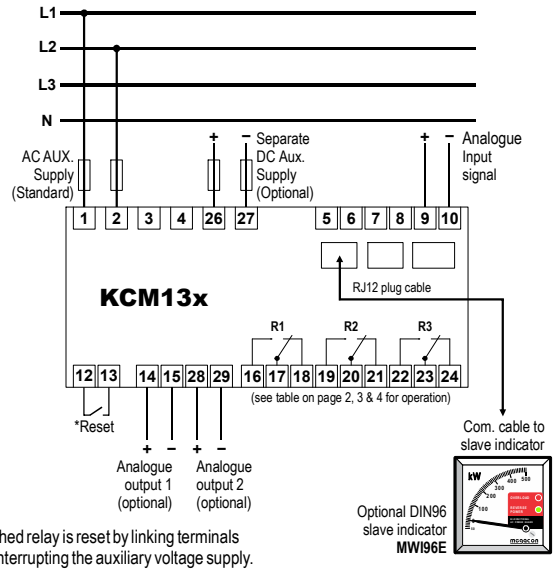
IS range

Connection Diagram

Connection Diagram without optional slave instrument



Connection Diagram with optional slave instrument



***Reset:** Any latched relay is reset by linking terminals 12 and 13 or by interrupting the auxiliary voltage supply.

Relays shown de-energised, a fail-safe relay energises When the unit is powered.

Analogue Output

The output signals are proportional to the meter reading (see page 2, 3 & 4 for an overview of models and functions).

The signal is specifically intended as an input to a control system for monitoring or control.

Add suffix from table below to type designation to specify output required:

Outputs 1		Outputs 2	
O/P1	**0 - 10mA**	O/P11	**0 - 10mA**
O/P2	**0 - 20mA**	O/P12	**0 - 20mA**
O/P3	**4 - 20mA**	O/P13	**4 - 20mA**
O/P4	**4 - 12 - 20mA**	O/P14	**4 - 12 - 20mA**
O/P5	**4 - 5,45 - 20mA**	O/P15	**4 - 5,45 - 20mA**
O/P6	**-10 - 0 - +10mA**	O/P16	**-10 - 0 - +10mA**
O/P7	**-20 - 0 - +20mA**	O/P17	**-20 - 0 - +20mA**
O/P8	**0 - 10V**	O/P18	**0 - 10V**
O/P9	**0,2 - 10V**	O/P19	**0,2 - 10V**
O/P10	**4,3 - 20mA**	O/P20	**4,3 - 20mA**

Relay Contacts

Burden on supply	: 170mW per relay
Switching voltage (Max)	: 400V AC, 300V DC
Switching voltage (Rated)	: 250V AC, 30V DC
Max I continuous	: 6A RMS, 6A DC
Max breaking capacity	: 1500VA AC, 18-120W DC
Dielectric strength across Open contacts	: 1000V RMS

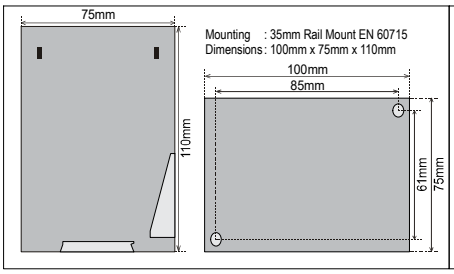
Connection

Terminal type	: Terminal Clamp and Screw
Wire max.	: T1-T4, T26-T27: AWG 24-14, T5-T10: AWG 12, other terminals: AWG 24-12
Screw Torque	: 0.5Nm

Overload

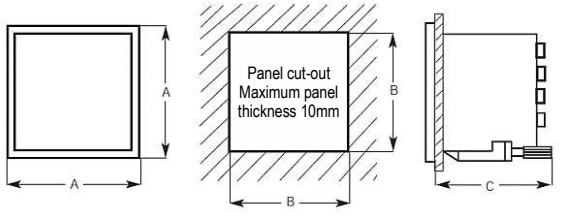
Voltage	: 1.2 x Un continuous 2 x Un for 10secs
Current	: 2.5 x In continuous 5 x In for 1secs (max 25A)

Dimensions



Slave Indicator

	A	B	C
DIN96	96 x 96mm	92 x 92mm	64mm



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ORDERING INFORMATION (Example)

Type	: KCM13M173FB
Aux. Supply	: 200-240VAC
Input	: -1/0/10mA
Range	: -50/0/500kW
Analogue output 1	: O/P3: 4-20mA
Analogue output 2	: O/P18: 0-10VDC

Optional Separate Aux. Supply: Add **-SD** for models with Separate **DC** Aux. Supply. (Example: KCM13M173FB-**SD**)

IS range