MMC
The New Generation
External
Electronic Load Monitoring

MARCH MASTER CONTROL

MMC

External electronic load monitoring for electric motors and electric motor driven devices. Safe protection for:

- **Process pumps**
- **Machine-tools**
- **Lifting devices**
- **Belt conveyers**
- **Agitators**

Simple, economical, dependable.

Original size

MARCH MASTER CONTROL

MMC uses the drive motor itself as a sensor, preventing damage caused by over/under-loading or machine stoppage in the case of blockage or component failure.
The analoque output tranfers the power data to a control system that enables immediate correction.

MARCH MASTER CONTROL MMC
ensures:

- Protection and security for machines.
- Reduction of operating expenses through damage prevention and maintenance "Just in time".
- Raises productivity by minimising down-times.

MARCH MASTER CONTROL
External electronic load monitoring

MMC detects the current drawn (I), the supply Voltage (U) and the phase angle (cos φ) of the drive motor under operating conditions. Through compensation adjustments of the internal resistance of the motor windings (R_i) the actual power output of the control motor to the machine/unit is selected. Operating parameters of min. and max. power output can be exactly adjusted and pre-selected. If the pre-set values are over or under attained, the machine is switched off immediately. Analog signals are transferred to the analog output and can be utilised as control signals.

- Compact construction design according to DIN and EN
- Galvanic separation of line- and supply voltages
- 20 load current ranges up to 10 A for optimal adjustment to the load current
- Available selections:
  Start-up and reaction time delays (set points);
  Minimum- and Maximum monitoring (digital settings),
  2 independent maximum set points can be selected.
- Functions and operating modes of relays can be adjusted and set with Dip-switches.
- Time range delays can be set with Dip-switches.
- 2 potential relay outputs, failure LED's
- Adjustment of operating delay, start-up bridging, compensation - motor.
- Analog output 0 - 10 V DC.
- Supply voltages:
  12. 24, 42, 48, 110, 127, 230, 400, 440, 500V AC, 24V DC.

MMC protects...

Against damages resulting from operational failures or errors by precise monitoring of both overload and underload conditions:

- Dry running, cavitation and blockage monitoring of displacement- and centrifugal pumps
- External power monitoring in hazardous and explosive environments.
- Blockage and dry running protection for worm conveyers.
- Monitoring of belt conveyers and filling machines.
- Overload monitoring of cranes, lifts and lifting equipment.

MARCH PUMPEN
Simply safe

Type: **MMC**

Accessories: **Transformer modules TR3 ...V~**
12, 24, 42, 48, 110, 127, 230, 400, 440, 500V AC
NT3 –24V DC

Technical Data

Supply voltages: 12 / 24 / 42 / 48 / 110 / 127 / 230 / 400 / 440 / 500V AC

Nominal variation of aux. volt.:	+10% .. -15% U_N
Nominal power consumtion:	4 VA
Frequency range:	48 - 63Hz
Duty cycle:	100% IEC class1c

Enviremental conditions:

Ambient temperature range:	- 25°C to + 55°C
Class of application HVF according to	DIN 40040

Accuracy:

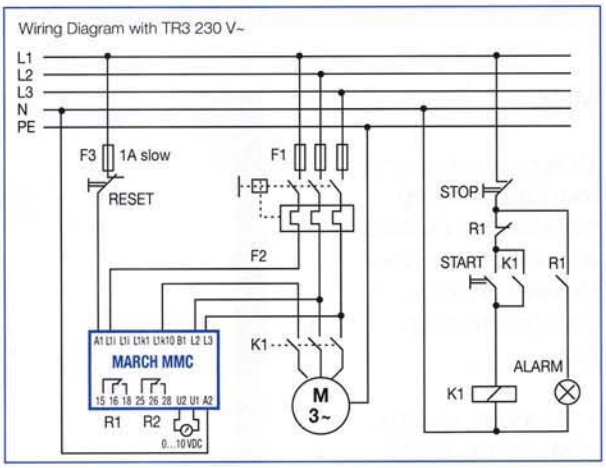
Repetition:	± 1%, ± 2%
(under constant conditions)	
Setpoints	± 2%,± 5%
(in % of nominal load)	
Influence of temperature:	± 0.3‰ / °C
Frequency range.:	± 1,5%
(30 - 400 Hz sin)	
Time delays:	± 20%
Reset after failure of supply voltage:	>20ms
Ready after failure of supply voltage:	< 1 sec
Efficiency ompensation - motor :	(0...180 Ω) ±15%
Analog output:	± 3%

Dimensions and standards:
75 x 55 x 117 mm (H x W x D)
Rail mounting according to DIN 46277/3
(European standard EN 50 022)
Protection class IP 40, VDE 0106 und VBG4
Screw terminals up to 4 mm^2, protection class of connection terminals shrouded against human contact IP 20
Terminal design and arrangement. acc. to DIN 46199

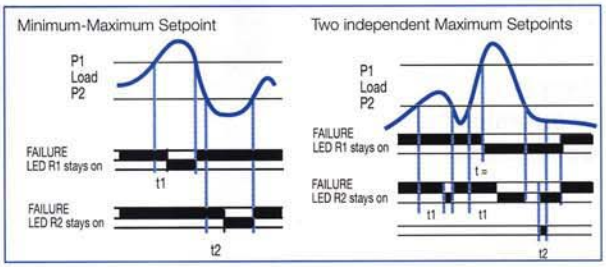
Output:
2 separated changes over (1 for each limit)

Nominal voltage:	250V~
Max. switching voltage:	440V~ 250V-
Max. continous current:	5A
Switching capacity:	1000VA
Mechanical life:	> 3 x10^7 operations
Electrical life:	> 3 x10^5 operations
	(230V AC, 5 A, cos φ =1)
Contact material:	silver- nickel
	thin film gold plated

Example of a wiring diagram



Examples of functions



Monitoring range

nominal rating	teminals	overload permanent	≤ 1 sek
	3-phase wiring		
3 ~ 100...400V	voltage: L1i - L2 - L3	450V	480V
I max **1 A**	current: L 1i - K1	1,2A	4A
3 ~ 100...400V	voltage: L1i - L2 - L3	450V	480V
I max **10A**	current: L 1i - K10	12A	40A
	1-phase wiring		
3 ~ 100...230V	voltage L1i - L2 - L3	256V	275V
I max **1A**	current: L 1i - K1	1,2 A	4A
3 ~ 100...230V	voltage: L1i - L2 - L3	256V	275V
I max **10A**	current: L 1i - K10	12 A	40A
	Analog output		
0 ~ 10 V DC	U1 (+) - U2 (-,PEN)	max. 1mA	

Range of adjustment

Load:	0 bis 99% of nominal load
Current / load.	0,1... 1 A steps from 0,1 A / < 130mΩ
	1 ....10 A steps from1,0 A / < 20mΩ
I = 0 detection active below app. < 5% of nominal rage	
Impedance correction:	0 ... 180 Ω / current 0,1 - 1,0A
	0 ... 18 Ω / current 1,0 -10,0A

Time delays

Start up delays:	1 ... 100 sec
Error message:	0,1 ... 50 sec

MARCH PUMPEN GmbH
ADVANCED SOLUTIONS IN LEAK-FREE PUMPTECHNOLOGY
Rathenaustraße 2
D35394 Gießen

Tel.: +49(0) 641 / 68 68 06-0
FAX:+49(0) 641 / 68 68 06-60
www.march-pumpen.com
info@march-pumpen.com

Subject to change without notice. Printed in Germany. 4/1997 KD

MARCH PUMPEN
Simply safe