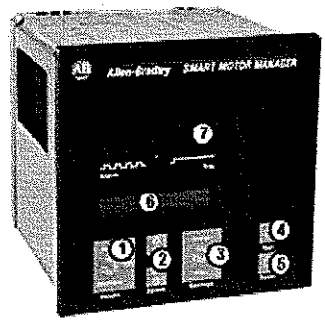
Specifications

Controls



1 **Values**	**Mode Selection**	5 **Reset**	**Reset trips**
Actual	Display current operating data		
Set	Setting mode (set, change, save, and store parameters)		
Recorded	Display recorded data		
2 **Select**	**Select functions and enter/change operating parameters**	6 **LCD**	**Single Line** (two lines of text are displayed alternately)
3 **Settings**	**Entry**	7 **Fault**	**LED**
Change	Enable entry	**Indicator**	Warning
Enter	Save entry	Blinking	Trip
		Continuous	
4 **Test**	**Test functions** (Alarm, trip, trip time)		

Settings

The following parameters must be programmed for every application The other parameters (e g , high overload, asymmetry) have factory-set values which are correct for most applications

Main Settings	**Setting Range**	**Factory Setting**
Rated motor current or operating current I_e	0.5...2000 A	20 A
Use of a primary current transformer	No/Yes	No
Current ratio of primary current transformer	1 ..2000	1
Locked-rotor current	2 5 12 I_e	6 I_e
Locked-rotor time*	1...600 s	10 s

* If, instead of the permissible locked-rotor time, the maximum starting time is known, the approximate locked-rotor time is calculated as follows: Locked rotor time = Starting time Ã· 1.4

Special Settings	**Setting Range**	**Factory Setting**
Connection of main relay (MR)	Electrically held/non-fail-safe	Electrically held
Connection of alarm relay (AL)	Non-fail-safe/electrically held	Non-fail-safe
Reset of thermal trip	Manual/automatic	Manual
Reset at...% thermal utilization	10 .100%	50%
Reset PTC trip	Manual/automatic	Manual
Cooling constant motor ON/OFF ratio	1 ..5	2 5
Motor insulation class	B/E/F	B

Function Overview

	Function Factory Setting	Setting Range	Setting Factory Setting	Tripping Delay Range	Tripping Delay Factory Setting	Relays‡ Selection	Relays‡ Factory Setting
Protective Functions							
Bulletin 825-M basic unit	On	—	—	—	—	MR	MR
Thermal overload	On	5 . 80%	35%	1 ..5 s	2.5 s	All	MR
Asymmetry/Phase loss	On	1 6 I_e	2.4 I_e	0 5...25 s	0.5 s	All	MR
High overload/Stalling	Off	25 . 100%	75%	1 . 60 s	10 s	All	MR
Underload	On	—	—	0 .. 240 s	0 s	—	—
Underload delay	On	10 . 100%	50%	0 1...5 s	0.5 s	All	MR
Earth fault (Holmgreen)	Off	—	—	1 . 240 s	10 s	All	MR
Start time monitoring	Off	1 . 10	2	—	—	All	MR
Limited number of starts per hour							
Option 825-MST	Off	4 . .12 I_e	10 I_e	20 . 990	50 ms	#1	#1
Short circuit	Off	5 mA . 50	1 A	ms	0 5 s	All	MR
Earth fault (core balance transformer)	Off	A	—	0 1 . 5 s	—	All∗	MR∗
Stalling during start∗	Off	—	—	—	800 ms	All	MR
PTC Thermistor input		—		—			
Option 825-MLV	Off	—	—	—	1 s	All	MR
Phase sequence (motor supply)	Off	—	—	—	2 s	All	MR
Phase loss (motor supply)							
Option 825-MMV	Off	50 . 200 °	50 °C	—	<8 s	MR,	MR
100 Ω Platinum RTD inputs #1 . .#6	Off	C	—	—	—	AL#1 . 3	—
(stator bearings)		—				—	
100 Ω Platinum RTD input #7†							
Alarm Functions							
Bulletin 825-M basic unit	Off	50 ..99%	75%	—	—	AL,#1 . 5	AL
Thermal utilisation (% Δ ϑ load)	Off	5 . 80%	20%	—	—	AL #1 . 5	AL
Asymmetry (% I_e)	Off	1 . 6 I_e	2 I_e	—	—	AL,#1 . .5	AL
High overload (% II_e)	Off	25 . 100%	75%	—	—	AL,#1 . . 5	AL
Underload							
Option 825-MST	Off	5 mA . 50	500 mA	—	—	AL #1 . .5	AL
Earth fault (core balance transformer)		A					
Option 825-MMV	Off	50 . 200 °	50 °C	—	—	AL,#1 . .5	AL
100 Ω Platinum RTD inputs #1 . .#6		C					
(stator, bearings)							

∗ Via external speed switch (control input #1); output relays and time delay as with high overload
† Includes ambient temperature in the thermal image.
‡ Only one relay can be selected per function; MR = main relay, AL = alarm relay, auxiliary relays #1...#5.

Function Overview, Continued

	Function Factory Setting	Setting Range	Setting Factory Setting	Tripping Delay Range	Tripping Delay Factory Setting	Relays‡ Selection	Relays‡ Factory Setting
Control Functions							
Bulletin 825-M basic unit	Off	50 . 100%	70%	4 . 60	60 min	—	—
Warm start (% of cold trip)	Off	Jumper	Y11- Y12	min.	—	—	—
Emergency start		Terminals		—			
Option 825-MST	On	4 . 20 mA	—	—	—	—	—
Analog output		0 . 100%					
assigned to:		5 ..200 °C					
- Thermal utilisation		I_e0 . 200%					
- PT100 max. Temperature							
- *I* Motor							
Control Auxiliary Relays #2, #3	—	—	—	—	—	—	—
via communication							
Control Input #1: (24V AC/DC; 8 mA)							
Alternatively, one of two functions may							
be selected:	Off	—	—	0 . 240 s	1 s	—	#2
• Pick-up delay, relay #2	Off	—	—	0 . 240 s	2 s	—	#2
• Drop-out delay relay #2	Off	—	—	—	—	—	—

• Disabling of protective functions:	Off	—	—	—	—	—	—
- Asymmetry/phase loss	Off	—	—	—	—	—	—
- High overload/stalling	Off	—	—	—	—	—	—
- Earth fault	Off	—	—	—	—	—	—
- Short circuit	Off	—	—	—	—	—	—
- Underload	Off	—	—	—	—	—	—
- Limited starts per hour	Off	—	—	—	—	—	—
- Thermistor PTC							
- 100 Ω Platinum RTD							
Control Input #2: (24V AC/DC; 8 mA)							
Alternatively, one of three functions can be selected:	Off	—	—	0 240 s	1 s	—	#3
• Pick-up delay, relay #3	Off	—	—	0 240 s	2 s	—	#3
• Drop-out delay, relay #3	Off	0 5 2000	20 A	—	—	—	—
• Set 2nd rated current	Off	A	—	—	—	—	—
• Disabling protective functions:	Off	—	—	—	—	—	—
- Asymmetry/phase loss	Off	—	—	—	—	—	—
- High overload/stalling	Off	—	—	—	—	—	—
- Earth fault	Off	—	—	—	—	—	—
- Short circuit	Off	—	—	—	—	—	—
- Underload	Off	—	—	—	—	—	—
- Limited starts per hour		—	—	—	—	—	—
- Thermistor PTC		—					
- 100 Ω Platinum RTD							
Option 825-MLV Star-Delta starting	Off		Y-Δ: 1.1 Â· I_e	Y-Δ: 1 240 s	10 s		Y: #4 Δ: #5

* Only one relay can be selected per function; MR = main relay, AL = alarm relay, relays #1...#5

Specifications

Bulletin 825-M Basic Unit and Bulletin 825-M Converter Module

Ambient Conditions

Temperature	–5.. +60 °C
Operation	–40 +60 °C
Storage	–40 +60 °C
Transport	
Climatic Withstand	40 °C, 92% relative humidity, 56 days
Damp heat IEC 68-2-3	25/40 °C 21 Cycles
Climatic cycling IEC 68-2-30	
Protection Class	IP65
Bulletin 825, enclosed in panel	IP20
Terminals	
Vibration Resistance per IEC 68-2-6	10 150 Hz, 3 G
Shock Resistance per IEC 68-2-27	30 G shock duration 18 ms half of a sin wave in x y z directions

Bulletin 825-M Basic Unit and Bulletin 825-M Converter Module, Continued

Rated Voltage U_e

Primary Control Circuit	**825-MCM2**	**825-MCM20**	**825-MCM630 825-MCM630N 825-MCM180**
Motor Circuit	400V AC	660V AC	1,000V AC
per IEC, SEV, VDE 0660	240V AC	600V AC	600V AC
per CSA, UL			
Control Circuit	400V AC		
Main relay (MR) 95.. 98, supply A1, A2	380V AC		
Phase-sequence protection L1 L2, L3	240V AC		
• per IEC 947			
• per SEV	400V AC		

• per CSA UL	250V AC
Alarm relay (AL) 13/14, Auxiliary Relays #1, #4 #5	240V AC
• per IEC 947	120V AC/30V DC
• per SEV	24V AC/DC
• per CSA, UL	
Auxiliary Relays #2, #3	
Control Inputs #1 #2	

Electrical Ratings

Test Voltage	**825-MCM2**	**825-MCM20**	**825-MCM630 825-MCM630N 825-MCM1808**
Motor Circuit per IEC 947-4	U_{imp} 2 5 kV	U_{imp} 6 kV	U_{imp} 8 kV
Control Circuit Control circuits against each other and against all other sets✶ Main relay (MR) 95 98, supply A1, A2 Phase sequence protection L1, L2, L3 Alarm relay (AL) 13/14, Auxiliary relays #1, #4, #5 • per IEC 947-4	U_{imp} 4 kV		
Core-balance transformer k, l Auxiliary relays #2, #3 Control inputs #1, #2 • per IEC 947-4	U_{imp} 2 5 kV		

EMC Standard

Noise emission	per EN 50 081-1 and EN 50 081-2
Noise proof	per EN 50 082-1 and EN 50 082-2
Standards	IEC 947-4, CSA C22 2 No 14, UL 508
Approvals	CE, UL-Listed CSA

Supply

Nominal supply voltage U_s	50/60 Hz: 22...24, 33 36, 44.. 48, 110 120, 220 240, 380...415, 440V AC 24. .48, 72. .120V DC
Permissible voltage fluctuation	AC 0 85 1 1 *U*s, DC 0 80 1 1 U_s
Power consumption	AC 13 VA, DC 10 W max
Short-circuit protection	With the appropriate supply cable rating the supply module is short-circuit proof

Terminals

Bulletin 825-M Plug-in Terminals	Range of gauges:	[mm²]	0 5 2 5 single-wire
		[mm²]	0.5 1.5 double-wire
• per UL		[AWG No.]	22. 14
• per VDE	Nominal gauge:	[mm²]	1 5
Main circuit 825-MCM2, 825-MCM20	Terminals:	[mm²] [AWG No.]	2 x 2.5/1 x 4 2 x 20 14/1 x 20 12
825-MCM180 825-MCM630(N)	Aperture: or bus bars: Bus bars	[mm] [mm] [mm]	∅ max 19 20/16 x 4 25 x 8

✶ The measuring inputs PT100 and PTC 4 20 mA analog output and the RS 485 communication interface are not isolated from one another.

Bulletin 825-M Basic Unit and Bulletin 825-MCM Converter Module, Continued

Relays

Contact Data of Output Relays, Main Relay (MR) 95 96

Contacts		1 N O and 1 N C contact, electrically insulated			
Nominal operating voltage per UL CSA: pilot duty 240V	[V]	24 110 125	220 250	380 440	
Continuous thermal current	[A]	4			
Rated operating current	AC-15 [A]	3	3	1 2	
Maximum permissible switching current (cos ϕ = 0 3)	AC-15 [A]	30	30	12	
Rated operating current	DC-13 [A]	2 0 3	0 2	—	
(L/R = 300 ms), no protection network necessary					
Max rated current of back-up fuse	[A]	fast (D) 16; slow (DT) 10 500V Type gG			

Alarm relay (AL), Auxiliary relays #1, #4, #5

Contacts		1 N O. contact each
Continuous thermal current	[A]	4
Maximum permissible switching voltage	[V]	400 AC, 125 DC
Nominal operating current	[A]	4 at 250V AC or 30V DC
cos ϕ= 1	[A]	2 at 250V AC or 30V DC
cos ϕ= 0 4, L/R = 7 ms		
Maximum switching power	[VA/W]	1250/150
cos ϕ= 1	[VA/W]	500/60
cos ϕ= 0.4, L/R = 7 ms	[V]	240; 1 A pilot duty
- per UL/CSA		
Auxiliary relays #2, #3		
Contacts		1 N O. contact each
Continuous thermal current	[A]	4
Maximum permissible switching voltage	[V]	48 AC, 30 DC
Maximum switching power	[W]	150
cos ϕ= 1	[W]	60
cos ϕ= 0.4, L/R = 7 ms		

Main Current Transformers for the Motor Circuit

When Bulletin 825-M is used as a secondary relay with Cat. Nos. 825-MCM2, 825-MCM20

Min. rated operating voltage	[V]	Nominal operating voltage of motors	
Min rated primary current I_{1n}	[A]	Nominal operating current of motor	
Rated secondary current	[A]	1 or 5	
Class and nominal overcurrent factor		5 P 10 ext. 120%✶	
Power rating	[Hz]	According to power consumption in leads and measuring circuits	
Rated frequency		50/60	
Burden	[VA]	825-M + 825-MCM2	825-M + 825-MCM20
Power consumption at maximum rated current†	[A]	0 1 per Phase	0.4 per Phase
Continuous thermal current	[A]	3	24
Thermal current during 1 s	[Hz]	250	600
Rated frequency		50/60	50/60
General Notes on 825-MCM			
No-load		An open-circuit secondary is permitted since the burden is installed in the detection module	

✶ Current transformer (P = Protection): ±1% error at rated current (I_e)
±5% error at rated overcurrent (10 Â I_e)
Rated thermal current = 120% I_e
For starting current 10 Â I_e: Class 5 P 20
The current transformer error is added to the Bulletin 825-M error
† 2.5 A with Cat. No. 825-MCM2, 20 A with Cat. No. 825-MCM20

Core Balance Current Transformer

Recommended Core Balance Current Transformer (cable-type)

Nominal ratio K_n =	Minimum detectable earth fault Pick-up current of Bulletin 825 earth fault protection
Burden: Bulletin 825-M	0 4
measuring circuit	0.5
Power consumption at	25
max rated current 0 5 A	50/60
[VA]	
Continuous thermal current	
[VA]	
Thermal current during 1	
sec[A]	
Frequency[Hz]	
Short-Circuit Protection	
Selection of circuit breaker or fuse and associated contactor	The line-side circuit breaker or fuse must ensure that the engine will start, while still switching off short-circuit currents fast enough. Because of the latter, the fuse selected should always be as small as possible. The lowest possible fuse rating depends on the starting current of the motor and the tripping time set on the Bulletin 825-M.
Short-Circuit coordination of the starter must always be	The contactor receives its tripping signal when the Bulletin 825 trips and must interrupt all currents up to the point of intersection of the time/current characteristics of the Bulletin 825 and circuit breaker or fuse. When starting large motors, the main contacts on the contactor are subjected to high thermal loads so that if the

considered	motor starting time exceeds a certain limit, the maximum permissible current has to be reduced The fuse or contactor rating must also allow for the prospective short-circuit current The Bulletin 825-MCM converter modules are short-circuit proof. The contactor coordination diagrams are available upon request.

Bulletin 825-M Basic Unit and Bulletin 825-MCM Converter Module

Response During Supply Voltage Failure
If the supply voltage fails, the setting data is retained

Supply voltage failure > 30 ms
- All attracted output relays drop out
- LED extinguishes
- The timer for duration of supply failure starts (max 8 h)
- The current and recorded data are memorized
- LCD extinguishes

Recovery of the supply voltage
- Start of initialization routine
- The time of occurrence and the duration of the supply voltage failure are recorded
- Thermal image is calculated and updated
- All output relays return to the state they were in before the supply failure
- LCD and LED are active

Automatic Recognition of the Converter Module
In the event of a fault, the output relay MR trips and the type of fault appears on the LCD

Bulletin 825-M devices regularly check
- The Bulletin 825-M <-> 825-MCM link
- Agreement between the rated current set and the current range of the Bulletin 825-MCM
- The supervisory circuits

Bulletin 825-MTUM Device for Indicating Thermal Utilisation, PT 100 max., I_{motor}

Display range	0 . 100 ($\Delta\vartheta I_e$ at rated current I_e)
Utilisation[%]	2 x 2.5
Wire[mm2]	96 x 96
Front[mm]	91 5 x 91 5 (–0/+ 0 5)
Panel cutout[mm]	55
Mounting depth[mm]	

Power Supply Module

Permissible voltage fluctuation[U_s]	AC 0.85 ..1.1, DC 0 80 1 1
Power consumption[VA/W]	AC 13/DC 10
Short-circuit protection	The power supply module is short-circuit proof

Weights

Bulletin 825-M with power supply module		[g] 1000
Bulletin 825-M without power supply module		[g] 710
Power supply module	825-MPS	[g] 290
Options	825-MPB	[g] 125
	825-MST	[g] 90
	825-MLV	[g] 90
	825-MMV	[g] 90
Converter modules	825-MCM2	[g] 570
	825-MCM20	[g] 570
	825-MCM180	[g] 860
	825-MCM630	[g] 3120
	825-MCM630N	[g] 5460
Core balance transformer	825-CBCT	[g] 500
Thermal utilisation indicator	825-MTUM	[g] 180
Mounting frame	825-FPM	[g] 860
PC Option kit	825-VISU	[g] 125
T connector	825-PTS	[g] 75
Stub cable	825-PTL2	[g] 40
	825-PTL4	[g] 45
Bus cable segment	825-PCB1	[g] 95
Bus termination	825-PCE	[g] 20
Bus cable	825-BC	[g] 59/m
Bus cable connector	825-CBC9	[g] 15
Bus bar for Cat No. 825-MCM180		
	825-MVM	[g] 230
	825-MVM2	[g] 230