

DC DRIVES

590 Series



The 590 series of dc thyristor drives uniquely offers the user a choice of three separate control technologies from one integrated range. A common power chassis with interchangeable control doors enables easy transition from one technology to another and minimises spares holding.

- 590 ANALOG - Low cost high specification
- 590 DIGITAL - Total drive system in a single module
- 590 LINK - Fibre optic based ultimate high speed control
- Module ratings up to 2700 Amps

Armature Current Ratings:

27, 35, 70, 110, 150, 180, 270, 450, 720, 800 Amp dc
 See page 25 for details of new high power 590H ratings up to 2700 Amps

Overload:

200% for 10 seconds, 150% for 30 seconds

Field Current:

10A (armature ratings 35 - 270A)
 20A (armature ratings 450 - 800A)

AC Supply Voltage:

208 - 500V $\pm 10\%$ (three phase) ratings 35 - 800A
 Special build options available < 208V

AC Supply Frequency:

45 - 65 Hz

Ambient Temperature:

45°C (ratings 35 - 70A) 35°C (ratings > 70A)
 derate 1% /°C above stated ambient to max. 55°C
 0 - 500 m ASL, derate 1% /200m above 500m to max. 5000m

590 ANALOG

The features offered in the 590 ANALOG series of three phase supplied dc drives are far in advance of those normally associated with analogue control. Based on the proven power technology of the 590 DIGITAL series, the 590 ANALOG is a highly cost effective solution for single or multi motor drive systems.

- No soldered calibration components
- Plug in commissioning board
- Speed or torque control
- On board adjustable field supply
- Upgradeable to 590 DIGITAL or 590 LINK
- 27 point diagnostic option

FEATURES

Surface mount technology
 Potentiometer adjusted thyristor field supply
 Speed feedback-analogue tachometer or armature voltage feedback (with optional 5590 AVFB unit)
 ac or dc tachometer compatible
 Armature current compensation output
 Ramped and 3 non ramped summed speed setpoint inputs
 Main and auxiliary current input
 Positive and negative remote current limit control
 Zero speed and drive ready relays
 Switch calibration of current, speed and feedback device
 Field configuration switch selection
 Separately adjusted acceleration and deceleration rates
 Fully protected to 590 DIGITAL specification
 Armature voltage 1.11 x ac supply volts (2 quadrant operation)
 Armature voltage 0.96 x ac supply volts (4 quadrant operation)

Optional Diagnostic Unit

The 5570 hand held diagnostic unit gives access to 27 key test points on the 590 ANALOG, rapidly reducing commissioning time and simplifying trouble shooting.
 3.5 digit LCD readout
 Access to 27 test points
 Rapid LED trend display
 Oscilloscope/recorder output
 Direct ribbon cable connection
 Full details on page 21

STANDARDS

CE marked
 EN50081-2 (1992) (EMC emissions, industrial with external filter fitted)
 pr EN50082-2 (1992) (EMC emissions, heavy industrial)
 VDE 0160 (1994)/pr EN50178 (1995) (safety, low voltage directive)
 listed to US and Canadian safety standards (up to 720A)
 North American standards pending >720A



The most powerful and flexible dc drive on the world market. The 590 DIGITAL offers an extensive range of application software functions (including winder control as standard) which together with a configurable block diagram and programmable I/O create a total drive system in a single module.

- Open and closed loop winder control
- 4 mode on board field controller
- Armature voltage up to 1.11 x ac supply volts
- Totally Configurable block diagram
- Simple multi-lingual programming
- Ratings from 35A to 2700A, two or four quadrant

FEATURES

Standard Software Functions

Open loop winder
 Closed loop winder
 Raise/lower ramp (MOP)
 PID control
 Linear or S ramp
 Speed/current profiling
 Jog and crawl functions
 Slack take up
 Draw control
 Sequencing logic
 Auto self tune

Man Machine Interface

32 character multi-lingual display
 High contrast easy to read LCD
 Simple logical menu structure programming
 Only 4 pushbuttons interrogate all functions

Inputs/Outputs

Analogue inputs - 6 (4 programmable)
 Analogue outputs - 3 (2 programmable)
 Digital inputs - 9 (3 programmable)
 Digital outputs - 3 (3 programmable)
 Reference supplies - + 10V, - 10V, + 24V (all regulated)
 Serial ports - P1 (Optional main comms. port) RS422/RS485 or PROFIBUS DP
 - P2 (Auxiliary port) RS422/RS485 for local operator station
 - P3 (System port) RS232 PC connection
 Speed feedback - Analogue tachometer/encoder/armature voltage/Microtach

Protection

Interline device networks
 High energy MOVs
 Overcurrent - instantaneous
 Overcurrent - inverse time
 Field failure
 Speed feedback failure
 Motor overtemperature
 Drive overtemperature (force cooled units)
 Thyristor trigger failure
 Stall protection

590 DIGITAL



Field Control

On board single phase half controlled field supply - 10A (35 - 270A ratings), 20A (450 - 800A ratings), 40A (950 - 2800A ratings).
 Field configuration
 - fixed current - field weakening
 - fixed voltage - field economy

590 LINK

LINK is a revolutionary high speed fibre optic based drive control system. Motor controllers including the 590 LINK dc drive and 620 VECTOR LINK high performance ac drive can be networked together onto the totally noise immune communications LINK highway.

- Fibre optic based noise immunity
- Remote digital and analogue I/O modules radically reduce site cabling
- Total configurability for the most advanced drive systems
- 590 LINK - Full specification of 590 DIGITAL dc drive
- Complete range of analogue and digital I/O modules, operator stations and third party PLC/PC interfaces

Full details on LINK see pages 28/29.

590SP

The 590SP is a single phase version of the 590 series. It is available in DIGITAL or LINK format, offering the same functionality as the three phase versions.

- Single phase supply 110, 240 or 400V
- 27 Amp armature rating
- Minimal footprint size
- DIGITAL or LINK format
- On board fixed field supply
- Cost effective, lower power system drive

DC DRIVES

590 Series Ancillary Equipment Options



The following, ac line reactors fuses and fuse holders are common to the 590 ANALOG, DIGITAL and LINK drives.

TECHNICAL SPECIFICATION

AC Line Reactors

Description	Part Number
35A, 50µH Line Reactor	C0055192
70A, 50µH Line Reactor	C0055193
110A, 50µH Line Reactor	C0055253
180A, 50µH Line Reactor	C0055255
250A, 50µH Line Reactor	C0057960
360A, 50µH Line Reactor	C0057961
550A, 25µH Line Reactor	C0057962
720A, 25µH Line Reactor	C0057963

EMC compliant filters see page 60.

Fuses and fuse holders

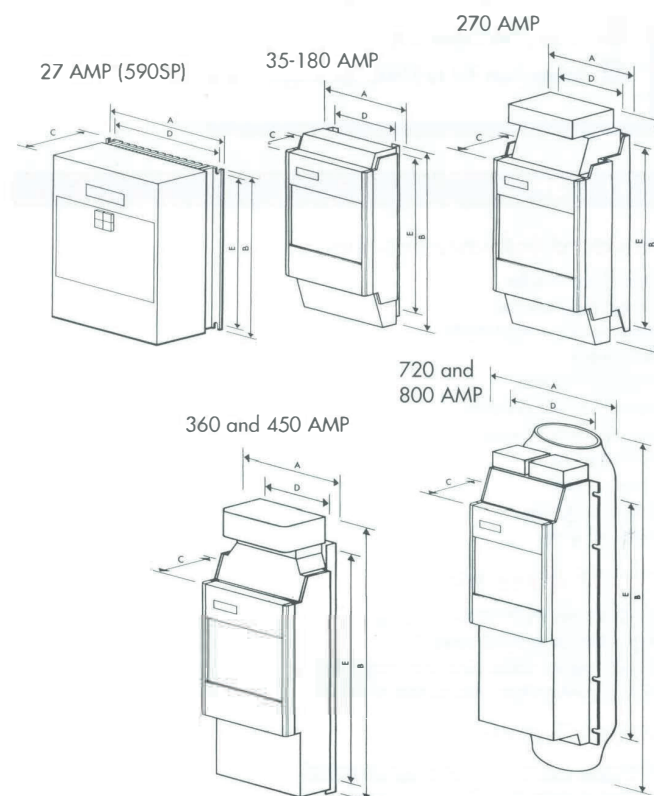
A range of high speed semiconductor fuses and fuse holders are available for the 590 dc drives. The ratings of the fuses are designed to suit the thermal and overload constraints of both fuses and holders - Eurotherm Drives will be pleased to advise in the event of any doubt as to correct fusing.

Fuse Description	Drive Rating	Holder Size	Part Number
40A	35A	00	CH570044
80A	70A	00	CH570084
160A	110A	1	CH580164
200A	150A	1	CH580025
550A	270A	3	CH590554
700A	450A	3	CH590075
800A	720A	3	CH590085

Holder Description

Size	Holder Description	Part Number
Size 00	Panel Mount	CP059914
Size 00	Busbar Mount Top Entry	DB058253
Size 00	Busbar Mount Bottom Entry	DB058254
Size 1	Panel Mount	DB389712
Size 1	Busbar Mount Top Entry	DB058256
Size 1	Busbar Mount Bottom Entry	DB058255
Size 3	Panel Mount	CP059912
Size 3	Busbar Conversion Kit	CP059913

Brake resistors and line reactors, see pages 60/61.



Dimensions

Current Rating (A)	Overall Dimensions			Fixing Centres		Weight (kg)
	A	B	C	D	E	
27 (590 SP)	197	241	111	184	239	8
35-70	250	415	180	200	400	10
110-150	250	445	180	200	400	14
180	250	555	180	200	400	15
270	300	500	210	200	400	20
360 & 450	322	705	252	200	600	30
720 & 800	370	930	330	300	133	65



- Ratings up to 2700 Adc
- Compact integrated module
- Supply voltages up to 690Vac
- Individual power stack replacement
- Internal power device fuses
- DIGITAL, ANALOG or LINK technology
- 2 or 4 Quadrant operation

The 590H series of integrated dc thyristor drive modules gives accurate speed and torque control of high power dc motors in the range 950 to 2700A. Available in DIGITAL, ANALOG or fibre optic LINK technologies the 590H series forms an integral part of the world leading 590 range of dc motor controllers.

FEATURES

Control door and functionality common to 590 series

- 590 DIGITAL
- 590 ANALOG
- 590 LINK

Power hardware maintenance by individual heatsink/thyristor power cell replacement

Control board maintenance by ribbon cable connected control door

Keyhole slot mounting

User selectable right or left busbar connections

Choice of integrated stack cooling fans or remote fans with ducting

On board 60Adc field controller

Regenerative and non regenerative options

Choice of overload to suit applications

Function Block Programming:

For full details of this unique programming concept and the ConfigEd Lite software, refer to page 15.

Ambient:

0 - 40°C derate 1%/°C above 40°C to 50°C max.

0 - 1000m ASL derate 1%/100m above 1000m to 5000m max.

Supply Frequency:

45 - 65 Hz

Field Current:

60A DC

Supply Voltage:

380 - 500Vac ± 10%

501 - 690Vac ± 10%

Armature Voltage Output:

590H/591H Digital or Link 1.15 x Vac

590H Analog 0.96 x Vac

591H Analog 1.11 x Vac

STANDARDS

CE pr EN50178 (1995) (Safety, low voltage directive)

DC DRIVES

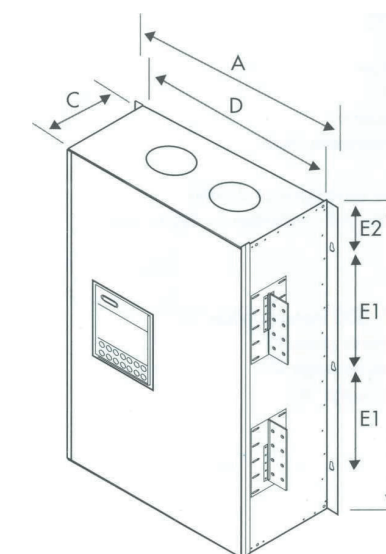
590H Series 950 to 2700A



With No Overload	Continuous Rated Armature Current Adc		
	With Overload 150% for 30s	With Overload 150% for 60s	With Overload 200% for 10s
1200	1050	1000	900
1700	1450	1400	1250
2200	1950	1900	1750
2700	2350	2250	2150

590H 4 Quadrant Regenerative

591H 2 Quadrant Non-Regenerative



Dimensions

Model	A	B	C	D	E1	E2
590H	850	1406*	401	810	3 x 400	78
591H	850	956*	401	810	2 x 400	78

*For top mounted fan B = +150