DC900P Digital DC Drive

ATIRO
(AUTOMATION & DRIVE)



DC900P Digital DC Drive

Product Range

The **DC900P** Series DC Digital Drive is designed for use in a suitable enclosure, with associated control equipment. The unit accepts a variety of standard three-phase AC supply voltages depending upon the model, and is suitable for the powering of DC shunt field and permanent magnet motors, providing controlled DC output voltage and current for armature and field.

All units are designed for simple and economical panel mounting using keyhole slots. Plug-in control connectors simplify the fitting and removal of the unit to the panel. Where possible, standard parts are used throughout the range thereby reducing the variety of spare parts required to maintain a multi-drive system. The control circuit is totally isolated from the power circuit thus simplifying the interconnection of controllers within a system and improving operator safety. The coding circuitry adjusts automatically to accept supply frequencies between 45-65Hz and possesses high immunity to supply-borne interference. The armature controllers are phase rotation insensitive.

With the software blocks like torque, setpoint sum, diameter, the drive can support a number of applications in various markets like **metal, cable, wire drawing, extrusion, plastics, film lines** to name a few.

Control and Communications

The drive is controlled by a 32 bit Microcontroller providing advanced features such as:

Complex control algorithms which provide highly precise and accurate controls.

Software-configurable control circuitry built around standard software blocks.

Serial link communications with other drives or a PC for advanced process systems.

The Keypad gives access to parameters, diagnostic messages, trip settings and full application programming.

Speed Feedback

Armature Voltage Feedback

Analog Tacho Calibration

Encoder Feedback

Communication：

MODBUS RS485

PROFIBUS DP

PROFINET

The DC900P can also be configured as

- Stack Controller – to control the existing thyristor stack
- 12 Pulse Operation – for reducing the harmonics
- DC Source – DC Voltage Source for supplying DC voltage for various applications like common DC bus etc.
- Field Supply – as 3 phase field supply for large DC motors





Operation Station

· Diganoise and Setup Parameters

· Mutilple Language

· Upload and download configrations

Function Blocks

Logic blocks and process blocks, supporting graphic programming

Option card

Support Modbus, Profibus DP, Profinet protocol option cards.

Autotune&Easy setup

DC900P can be setup and autotuning quickly. High accuracy feedback supports stable control on low speed.

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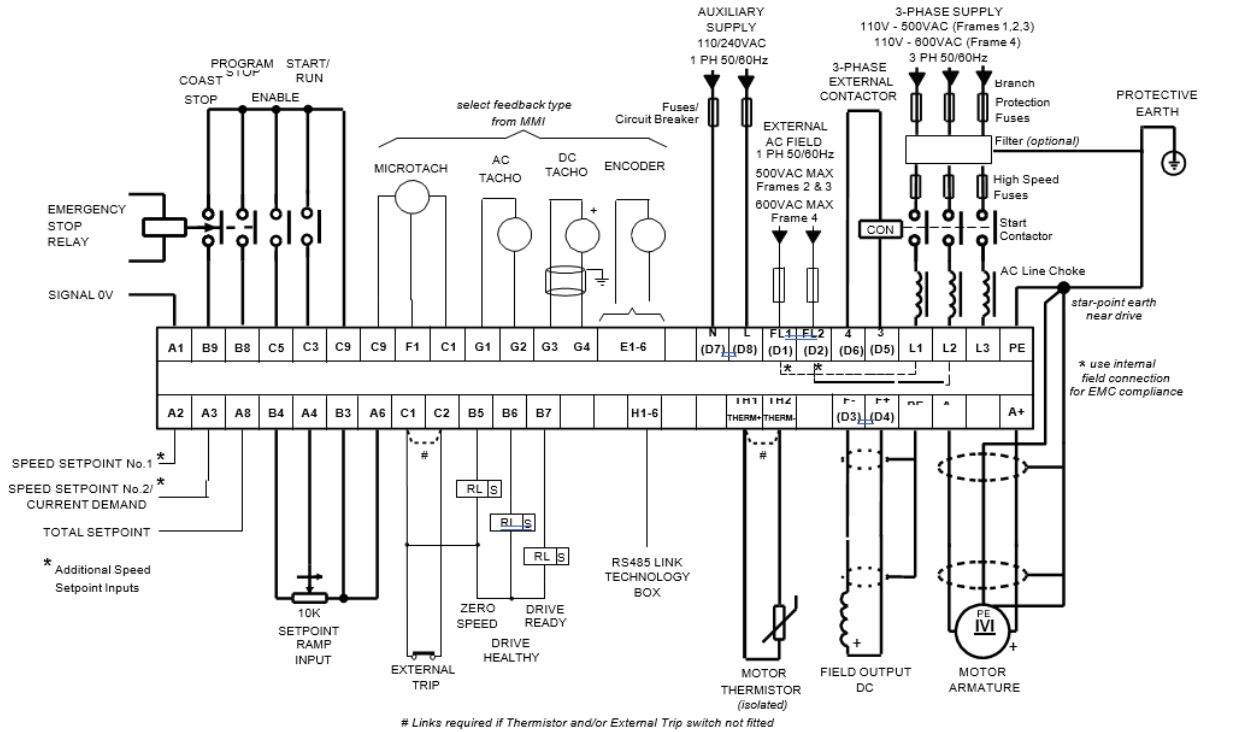
Control Features

Control	Control Circuits	Fully isolated from power circuit (SELV)
	Output Control	• Fully controlled 3-phase thyristor bridge • Microprocessor implemented phase control extended firing range • For use on 50 or 60Hz supplies with a frequency compliance range of 45 to 65Hz • Phase control circuits are phase rotation insensitive
	Control Action	• Fully digital • Advanced PI with fully adaptive current loops for optimum dynamic performance • Self Tuning Current Loop utilising "Autotune" algorithm • Adjustable speed PI with integral defeat
	Speed Control	• By Armature Voltage feedback with IR compensation • By Encoder feedback or analog tachogenerator
	Speed Range	100 to 1 typical with tachogenerator feedback
	Steady State Accuracy	• 0.01 % Encoder Feedback with Digital setpoint (serial link or P3) • 0.1 % Analog Tach Feedback • 2 % Voltage Feedback **NOTE Long term analog accuracy is subject to tachogenerator temperature stability.**
	Adjustments	All adjustments in software can be altered by the Keypad or via serial communications. The Keypad provides monitoring and adjustment of parameters and levels, in addition to diagnostic facilities.
Protection		• High energy MOVs • Overcurrent (instantaneous) • Overcurrent (inverse time) • Field failure • Speed feedback failure • Motor overtemperature • Thyristor Stack overtemperature • Thyristor "Trigger" failure • Thyristor Snubber Network • Zero-speed detection • Standstill logic • Stall protection
Diagnostics		• Fully computerised with first fault latch and automatic display • Digital LCD monitoring • Full diagnostic information available on RS422/RS485 • LED circuit state indication

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Connection Diagrams

FRAMES 1, 2, 3 & 4
Bold lines indicate "minimum connections"



Links required if Thermistor and/or External Trip switch not fitted

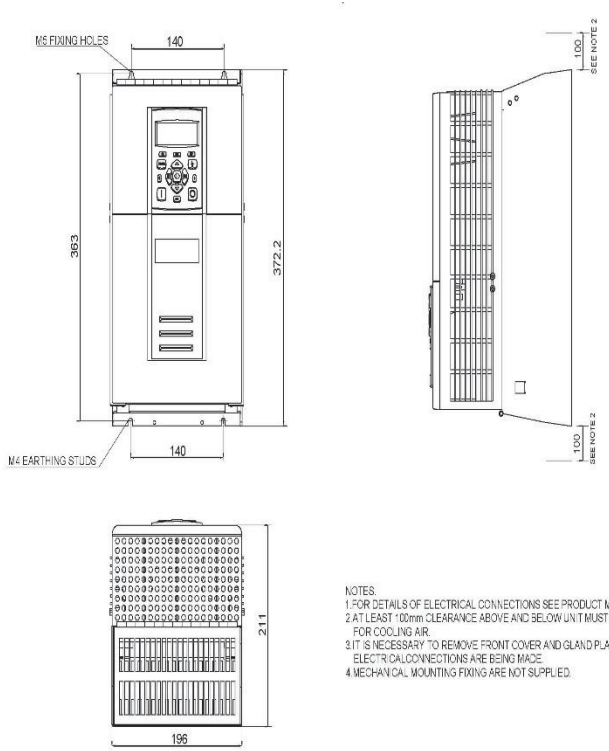
DC900P

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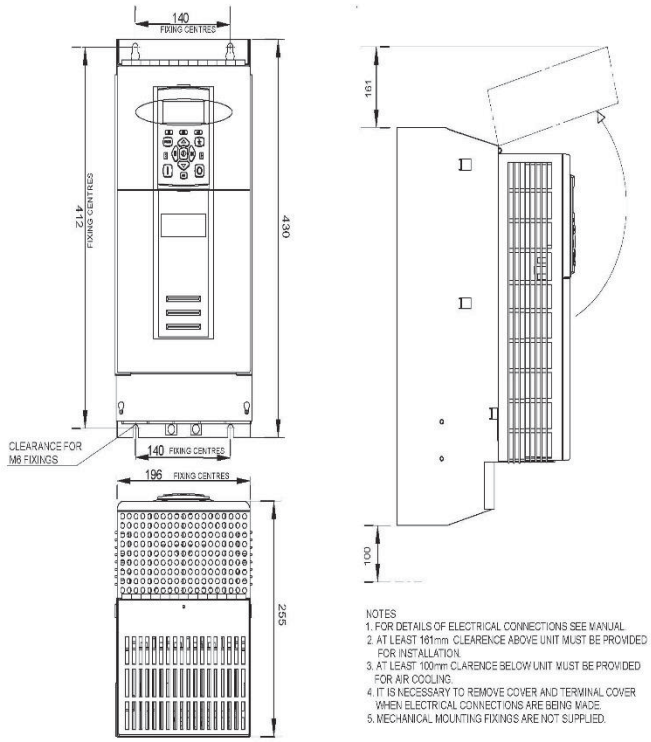
DC900P				
P/N	2Q/4Q	Armature Current	Field Current	Power @ 400V Armature
DC900P-2-500-20A	2Q	20A	10A	7.5KW-15KW
DC900P-4-500-20A	4Q	20A	10A	7.5KW-15KW
DC900P-2-500-35A	2Q	35A	10A	7.5KW-15KW
DC900P-4-500-35A	4Q	35A	10A	7.5KW-15KW
DC900P-2-500-80A	2Q	80A	10A	18.5KW-30KW
DC900P-4-500-80A	4Q	80A	10A	18.5KW-30KW
DC900P-2-500-120A	2Q	120A	20A	37KW-45KW
DC900P-4-500-120A	4Q	120A	20A	37KW-45KW
DC900P-2-500-165A	2Q	165A	20A	55KW
DC900P-4-500-165A	4Q	165A	20A	55KW
DC900P-2-500-200A	2Q	200A	20A	75KW

DC900P				
P/N	2Q/4Q	Armature Current	Field Current	Power @ 400V Armature
DC900P-4-500-200A	4Q	200A	20A	75KW
DC900P-2-500-280A	2Q	280A	20A	90KW-110KW
DC900P-4-500-280A	4Q	280A	20A	90KW-110KW
DC900P-2-500-400A	2Q	400A	30A	132KW-160KW
DC900P-4-500-400A	4Q	400A	30A	132KW-160KW
DC900P-2-500-550A	2Q	550A	30A	180KW-220KW
DC900P-4-500-550A	4Q	550A	30A	180KW-220KW
DC900P-2-500-750A	2Q	750A	30A	250KW-280KW
DC900P-4-500-750A	4Q	750A	30A	250KW-280KW
DC900P-2-500-850A	2Q	850A	30A	315KW
DC900P-4-500-850A	4Q	850A	30A	315KW

DC900P Dimension

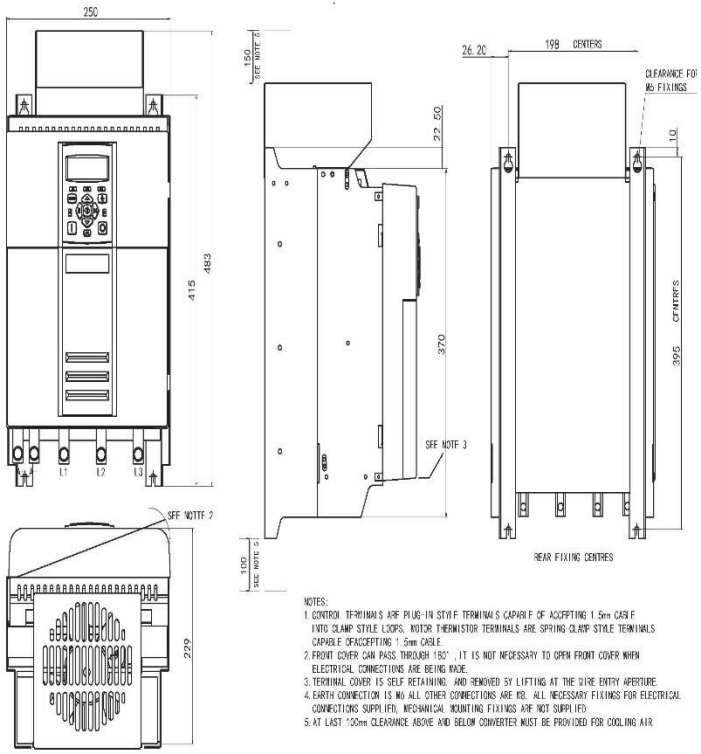


20-35A

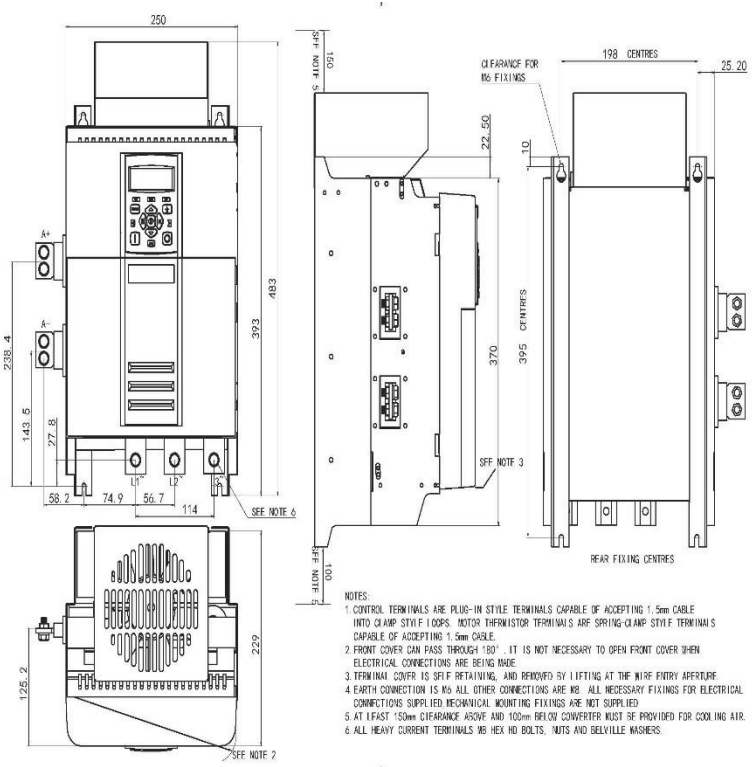


40-165A

DC900P Dimension

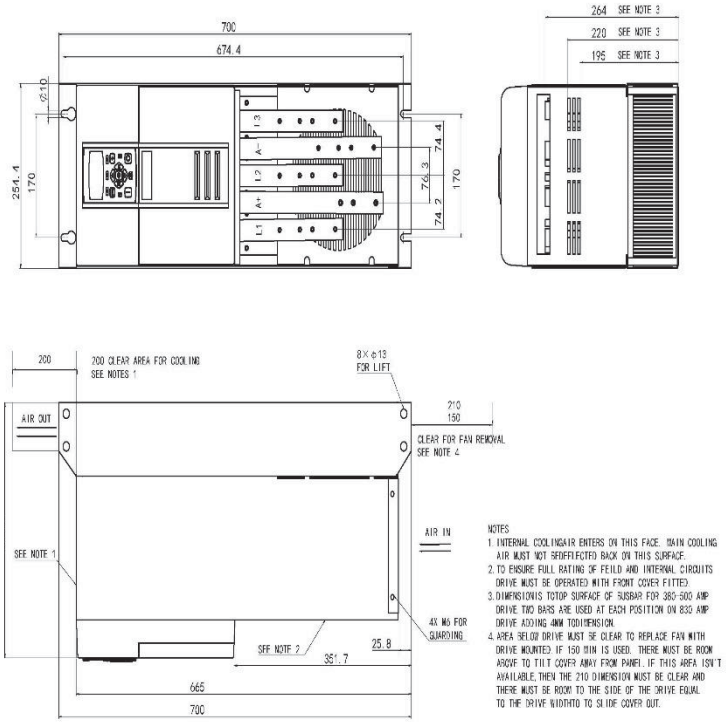


200A



280A

DC900P Dimension



400-850A

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DC 900P Appearance







DC900P Operation Station



D900P OP

Diagnose Setup System menu

Support local mode and remote mode

JOG led flash display

Upload and download configurations

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DC900P CONTROL WIRING





APPLICATIONS

WIRE AND CABLE



Rod Break Down

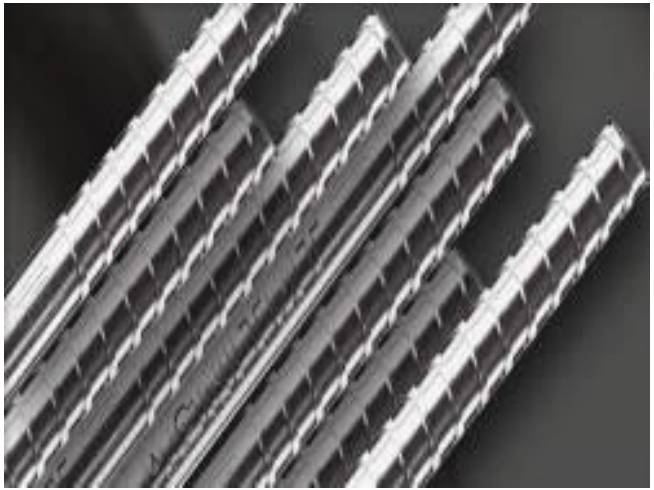


Bunching Machine

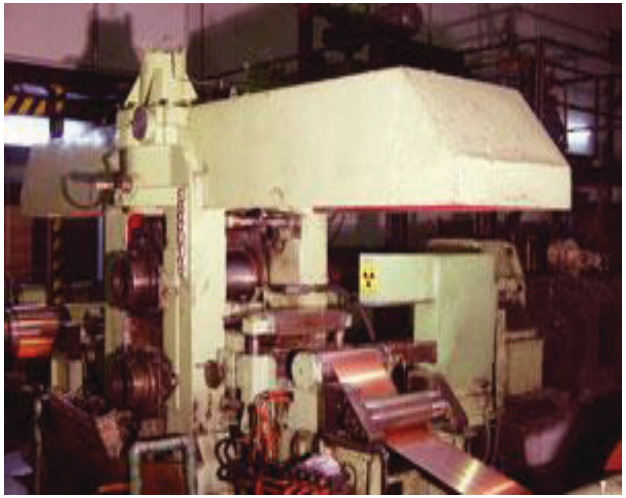


Pay Off and Take Up

METALS



Long Products



Flat Products

Material Movement and Press

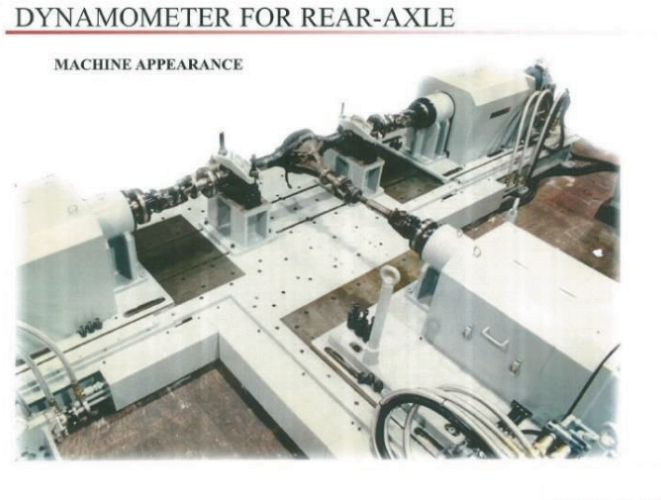


Heavy Duty Press

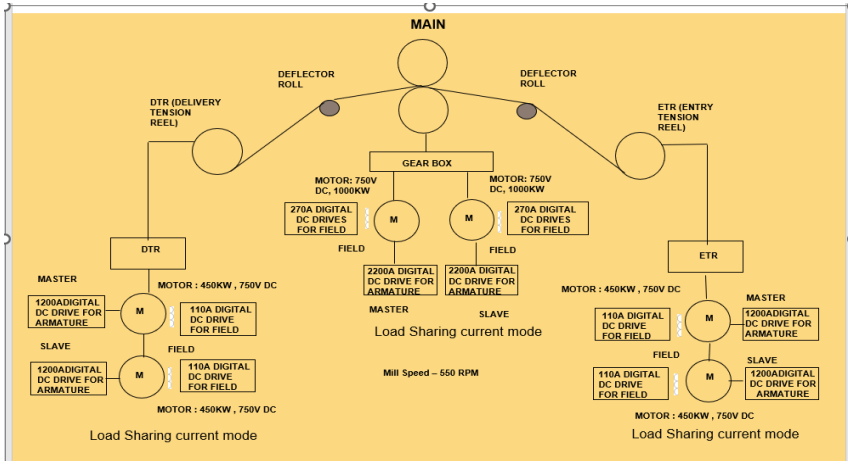


Crane and Hoists

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DYNAMOMETER



COLD ROLLING MILL

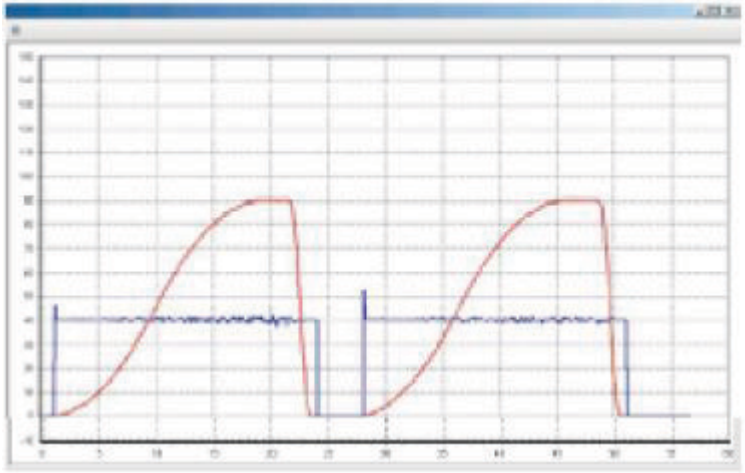
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CACT SOFTWARE

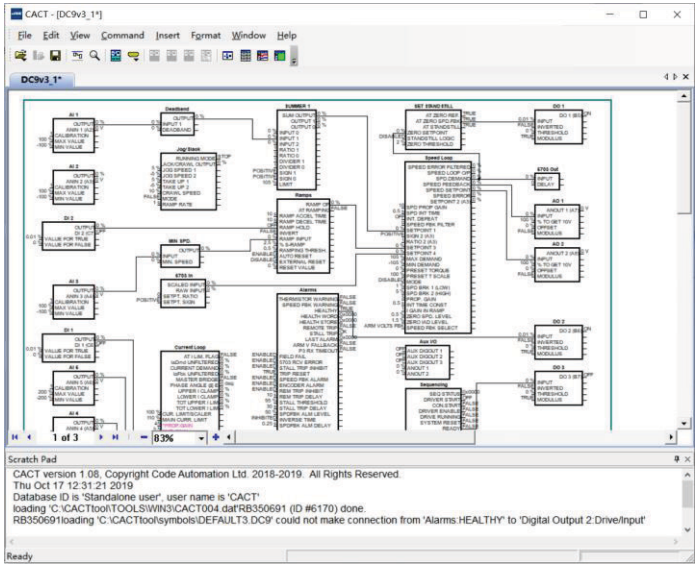
- Easily configurable
- Online Monitoring
- All Important Blocks Available for Configuring
- PLC Functionality
- Freely Downloadable
- Help Menu Available for Each Block

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Software

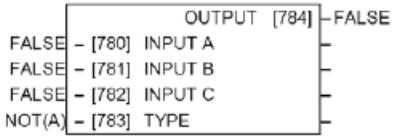


Online Monitoring



Easy and Powerful Configuration

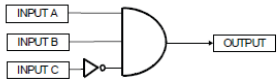
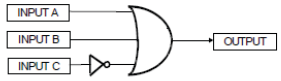
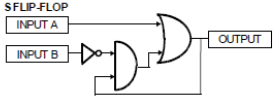
12 LOGIC FUNCTION BLOCKS



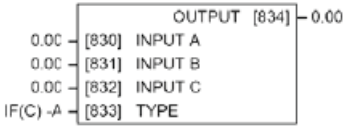
The operation to be performed on the three inputs to produce the output value. The operations that can be selectedare:

0: NOT(A)
1: AND(A,B,C)
2: NAND(A,B,C)
3: OR(A,B,C)
4: NOR(A,B,C)
5: XOR(A,B)
6: 0-1 EDGE(A)
7: 1-0 EDGE(A)
8: AND(A,B,!C)
9: OR(A,B,!C)
10: S FLIP-FLOP
11: R FLIP-FLOP
12: LATCH
13: SWITCH
14: (A AND B) OR C
15: (A OR B) AND C

EXAMPLE OF LOGIC FUNCTION BLOCK

Operation	Description	
AND(A,B,!C)	AND(A,B,!C)  Refer to the Truth Table. FALSE = 0, TRUE = 1.	**Input State** **A B C Output State** 0 0 0 **0** 0 0 1 **0** 0 1 0 **0** 0 1 1 **0** 1 0 0 **0** 1 0 1 **0** 1 1 0 **1** 1 1 1 **0**
OR(A,B,!C)	OR(A,B,!C)  Refer to the Truth Table. FALSE = 0, TRUE = 1.	**Input State** **A B C Output State** 0 0 0 **1** 0 0 1 **0** 0 1 0 **1** 0 1 1 **1** 1 0 0 **1** 1 0 1 **1** 1 1 0 **1** 1 1 1 **1**
S FLIP-FLOP	S FLIP-FLOP  	This is a set dominant flip-flop. INPUT A functions as *set*, and INPUT B as *reset* .

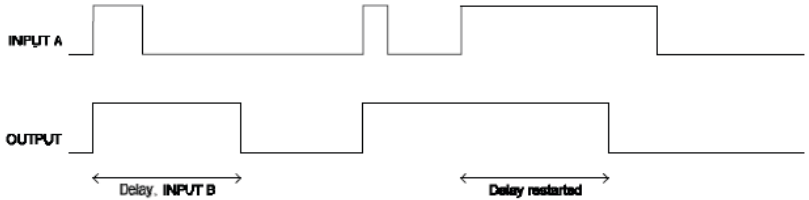
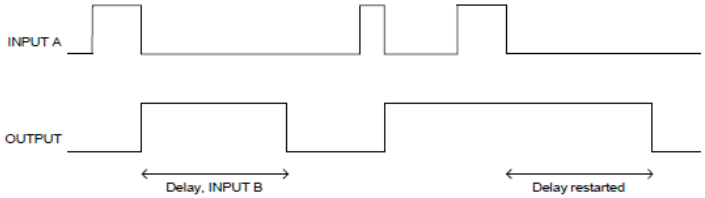
12 VALUE FUNCTION BLOCKS



The operation to be performed on the three inputs to produce the output value.

0: IF(C) -A
1: ABS(A+B+C)
2: SWITCH(A,B)
3: (A*B)/C
4: A+B+C
5: A-B-C
6: B<=A<=C
7: A>B+/-C
8: A>=B
9: ABS(A)>B+/-C
10: ABS(A)>=B
11: A(1+B)
12: IF(C) HOLD(A)
13: BINARY DECODE
14: ON DELAY
15: OFF DELAY
16: TIMER
17: MINIMUM PULSE
18: PULSE TRAIN
19: WINDOW
20: UP/DWN COUNTER
21: (A*B)/C ROUND
22: WINDOW NO HYST
23: WIND A>=B,A<=C
24: A<=B
25: ((A*B)/100)+C
26: MIN(A,B,C)
27: MAX(A,B,C)
28: PROFILE SQRT
29: PROFILE LINEAR
30: PROFILE x^2
31: PROFILE x^3
32: PROFILE x^4
33: ON A>B, OFF A<C
34: (A+B) CLAMPED C
35: (A-B) CLAMPED C
36: (A*B) CLAMPED C
37: (A/B) CLAMPED C
38: A>=B:A, A<=C:0
39: (A * B) + C
40: A * (B + C)
41: A * (B - C)
42: A * (1+B/C)
43: A * (1+(B * C))
44: MONOSTABLE HIGH
45: MONOSTABLE LOW
46: FILTER

EXAMPLE OF VALUE FUNCTION BLOCK

Operation	Description
A * (1+B/C)	The OUTPUT is set to the result of INPUT A * (1.0 + (INPUT B / INPUT C)). If INPUT C is zero then the result if (INPUT B/INPUT C) will be 32768.0 for positive values of INPUT B, and -32768.0 for negative values of INPUT B.
A * (1+(B * C))	The OUTPUT is set to the result of INPUT A * (1.0 + (INPUT B * INPUT C)).
MONOSTABLE HIGH	The OUTPUT is set HIGH, (0.01), on the rising edge of INPUT A. The OUTPUT remains high for a delay set by INPUT B, (in seconds). If a second rising edge reaches INPUT A while OUTPUT is high, the delay is restarted.  The OUTPUT is inverted if INPUT C is not zero.
MONOSTABLE LOW	The OUTPUT is set HIGH, (0.01), on the falling edge of INPUT A. The OUTPUT remains high for a delay set by INPUT B, (in seconds). If a second falling edge reaches INPUT A while OUTPUT is high, the delay is restarted.  The OUTPUT is inverted if INPUT C is not zero.
FILTER	The OUTPUT is the result of INPUT A passed through a first order low pass infinite impulse response filter with time constant set by INPUT B, (in seconds). If INPUT C is not zero then the OUTPUT is set to INPUT A.

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